Series 1936, No. 16 Issued May 1942

# Soil Survey

# Albany and Schenectady Counties New York

By
CLARENCE LOUNSBURY, in Charge
and
ROBERT WILDERMUTH
United States Department of Agriculture
and
W. E. BENSON and D. F. KINSMAN
Cornell University Agricultural Experiment Station

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY
In cooperation with the
Cornell University Agricultural Experiment Station

For sale by the Superintendent of Documents, Washington, D. C. Price 45 cents

This publication is a contribution from

BUREAU OF PLANT INDUSTRY
E. C. AUCHTER, *Chief*

DIVISION OF SOIL SURVEY
CHARLES E. KELLOGG, *Principal Soil Scientist, in Charge*

CORNELL UNIVERSITY AGRICULTURAL EXPERIMENT STATION
C. E. LADD, *Director*

DEPARTMENT OF AGRONOMY
T. L. LYON, *Head*

Series 1936, No. 16 Issued May 1942

# SOIL SURVEY OF ALBANY AND SCHENECTADY COUNTIES, NEW YORK

By CLARENCE LOUNSBURY, in Charge, and ROBERT WILDERMUTH, Division of Soil Survey,[1] Bureau of Plant Industry, United States Department of Agriculture, and W. E. BENSON and D. F. KINSMAN, Cornell University Agricultural Experiment Station

Area inspected by W. J. LATIMER, Inspector, District 1

United States Department of Agriculture in cooperation with the Cornell University Agricultural Experiment Station

## CONTENTS



[1] The field work for this survey was done while the Division was a part of the Bureau of Chemistry and Soils.

300781—42——1

## INTRODUCTION

The soil survey map and report of Albany and Schenectady Counties, N. Y., are intended to convey information concerning the soils, crops, and agriculture of the county to a wide variety of readers.

Farmers, landowners, prospective purchasers, and tenants ordinarily are interested in some particular locality, farm, or field. They need to know what the soil is like on a certain piece of land, what crops are adapted, what yields may be expected, and what fertilization and other soil-management practices are needed for best results. Many people do not wish to read the entire soil survey report, and they need not do so to obtain much of the information essential to their purpose.

A person interested in a particular piece of land should first locate it on the colored soil map accompanying the report. Then, from the color and symbol, the soil may be identified in the legend on the margin of the map. By using the table of contents, the reader can find the description of the soil type or types. Under each soil type heading is specific information about that particular soil. There is a description of the landscape, including the lay of the land, drainage, stoniness (if any), vegetation, and other external characteristics; and the internal or profile characteristics of the soil—its color, depth, texture, structure, and chemical or mineralogical composition. The description includes information about present land use, crops grown, and yields obtained, and statements concerning possible uses and present and recommended management.

By referring to the section on Productivity Ratings one may get an idea of how the soil types compare, one with another, as to productivity for the various crops and how well they are suited for the growing of crops or for other uses. Further ideas concerning land use and soil management can be obtained from the section dealing with those subjects.

For the person unfamiliar with the area or county, there is a general description of the area as a whole in the first part of the report. Geography, physiography, regional drainage, relief, vegetation, climate, population, transportation facilities, and markets are discussed. A brief summary at the end gives a condensed description of the area and important facts concerning the soils and agriculture.

The agricultural economist and the general student of agriculture will be interested in the sections on Agricultural History and Statistics, Productivity Ratings, and Agricultural Methods and Soil Management.

Soil specialists, agronomists, experiment station and agricultural extension workers, and students of soils and crops will be interested in the more general discussion of soils in the section on Soils and Crops as well as in the soil type descriptions. They will also be interested in the sections on Productivity Ratings and Agricultural Methods and Soil Management.

For the soil scientist, the section on Morphology and Genesis of Soils presents a brief technical discussion of the soils and of the soil-forming processes that have produced them.

## COUNTIES SURVEYED

Albany and Schenectady Counties are in the eastern part of New York State (fig. 1). The Hudson River forms the eastern boundary of Albany County and the Mohawk River a part of its northern boundary.

Schenectady County adjoins Albany County on the north, and together the two counties present a roughly pentagonal form, about 20 miles from east to west and 35 miles from north to south. Albany County has an area of 527 square miles and Schenectady County 206 square miles, a total of 733 square miles, or 469,120 acres.

In its physiographic aspect the area surveyed consists of two main divisions, namely the Hudson Valley, or inner lowland, comprising the eastern and northeastern parts, and a high plateau, the Southern New York section of the Appalachian Plateaus, comprising the western and southern parts (fig. 2).

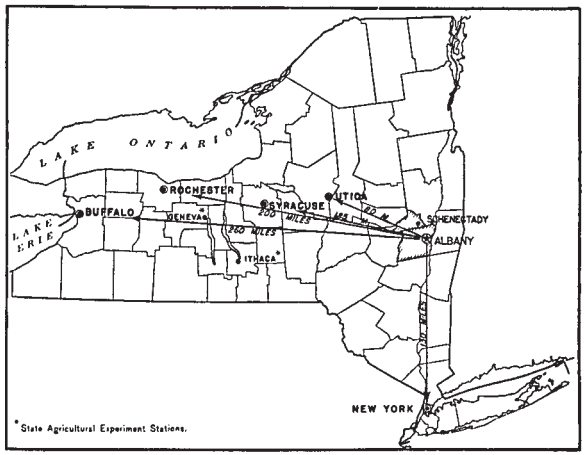


FIGURE 1.—Sketch map showing location of Albany and and Schenectady Counties, N. Y.

The Hudson Valley lowland, comprising about two-fifths of the area, extends westward from the Hudson River and northward to include the eastern part of Schenectady County. West of it the Helderberg escarpment, rising abruptly just west of Ravena, South Bethlehem, Clarksville, and Altamont, presents a definite line of demarcation. North of Altamont the escarpment extends in a northerly direction, with less abruptness west of Schenectady, and continues northward through Schenectady County. The narrow valley of the Mohawk River above Schenectady forms a northwest projection of the lowland.

In general, this lowland plain has an undulating to gently rolling surface. At its narrow southern extremity near Ravena its elevation is lowest—less than 200 feet above sea level. As the plain extends northward and broadens the elevation rises, and in the northeastern part of Albany County and the eastern part of Schenectady County it is as much as 400 feet above sea level. The southern and central parts, representing an old lake plain, generally are the smoothest parts of the lowland. Stream dissection has modified the original old lake plain to some extent. The northeastern part of Albany County and that part of eastern Schenectady County lying south of the Mohawk River are more or less rolling country marked by glacial till, low drumlike hills, and rounded knolls. This landscape is varied, as in the area north of Guilderland, by billowy dunelike

deposits of sand. Along the Hudson River the slope inclines sharply eastward, and here the relief is more or less broken by stream valleys and, in places, by shallow rock-ribbed formations. West of Unionville and Feura Bush the surface is marked, as in the northeastern part of Albany County, by drumlinlike hills and some shallow rock shelves.

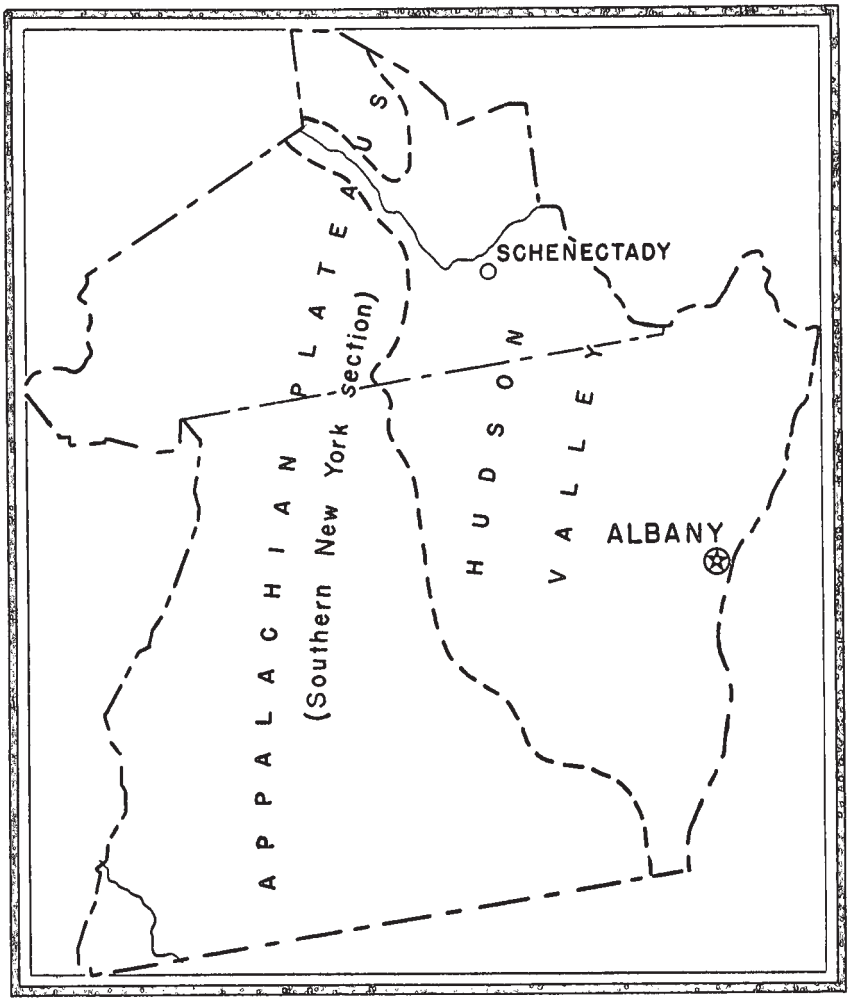


FIGURE 2.—Outline map showing physiographic divisions of Albany and Schenectady Counties, N. Y.

Drainage in this physiographic section flows eastward and southward. For the most part, the streams have developed a dendritic pattern and, with few exceptions, drain the surface readily. Normans Kill, the principal stream aside from the Mohawk River, occupies a broad, rather shallow valley in its upper reaches and a narrower hanging valley in its lower reaches. In the southern part of the area drainage is more southerly.

The plateau section of the western part of the area, which is a part of the Appalachian Plateaus' physiographic province, is a more or less distinct peneplain, which has been dissected by a number of streams into a series of hills and ridges. From a distance the ridge tops form an almost level sky line. In Albany County a belt of rather rugged terrain, from 1 to 2 or more miles in width, adjoins the escarpment along the eastern border of the plateau. West of this, in the northwestern part of this county, the surface is more or less rolling. Near the escarpment the elevation ranges from 1,400 to 1,500 feet above sea level; farther west it is from 1,000 to 1,200 feet. South of East Berne and West Berne the country becomes more rugged. Here, the elevation of rock-ribbed hills ranges in most places from 1,500 to 1,900 feet above sea level, increasing southwest of Rensselaerville to about 2,110 feet, the highest elevation in the area surveyed. In the southern part of Albany County the land is more or less dissected, but the elevation gradually declines to 1,000 or 800 feet, and even less along the eastern part of the southern boundary. The valley of the southeasterly flowing Catskill Creek cuts deeply into the high country of southwestern Albany County. Steep rugged slopes border the valley.

The western part of Schenectady County is generally rolling and ranges from about 700 to 1,300 feet in elevation. In many places a series of narrow parallel rounded ridges extend in an east-west direction. The northwestern part, north of the Mohawk River, is high and rolling. Thin till deposits cover the southern part, and smooth thin till deposits cover the western part. Like formations slope to the northeast. The elevations range from about 600 to 1,000 feet. The slopes flanking both sides of the Mohawk River Valley here are abrupt and well dissected.

Albany and Schenectady Counties are in the forest areas where the ash, chestnut, hickory, and poplar trees of the southern hardwood forest intermingle with the white pine, sugar maple, beech, birch, and hemlock trees of the northern hardwood forest (*12*).[2] The section also adjoins the spruce-fir coniferous forest of the Adirondack Mountains. Forest growths of the Hudson Valley belong with the southern hardwoods group, whereas those of the Appalachian Plateaus are like the northern forests.

The original forests, according to early accounts, were vigorous, thrifty growths that dominated the landscape and allowed little undergrowth. With the occupation of the country and the extension of farm lands the virgin forests gradually disappeared. The remaining forests constitute farm wood lots and cover the steep and more rugged areas. In the Hudson Valley, white pine, quaking aspen (poplar), ash, hard maple, white oak, red oak, and, in places white birch or canoe birch, with other hardwoods are important. On the higher plateau area the leading species of trees are hard maple, beech, red oak, white birch, white pine, and hemlock. Chestnut once abounded. On some of the sandstone and gritty shale materials cedars are common, and along the Helderberg limestone cliffs the low bushy form of juniper (*Juniperus communis depressa* Pursh), and the erect juniper (*J. communis* L.) are common. On some steep

[2] Italic numbers in parentheses refer to Literature Cited, p. 79.

shaly slopes Canada yew or ground hemlock (*Taxus canadensis* Marsh.) is conspicuous, together with Canada hemlock (*Tsuga canadensis* (L.) Carr.) (*11*). The latter also thrives more widely in many glacial till soils with dense subsoils.

Illustrative of the change in the character of forest cover since human occupation is that recorded of the sandy area, locally known as the pinebush, between Albany and Schenectady (*11*). Here the original forest, mostly white pine, with some oak, grew tall. A humous mat kept much of the ground in a rather swampy condition. Because of the removal of the forest cover and the ravages of fires, the region was transformed to its present condition of stunted growths of pitch pine, scrub oaks, gray birch, hazel, alder, and quaking aspen, with a thick undergrowth of black huckleberry. There are many barren patches of sand. Other open spaces support a western grass, fall witchgrass or diffuse crabgrass (*Leptoloma cognatum* (Schult.) Chase), which has arrived lately.

Widespread throughout the area are such trees as aspens, shadblow or juneberry, a wild species of cherry locally called red cherry, dogwood, beech, striped maple, and several kinds of birch; and in lower poorly drained positions, alder, soft maple, larch or tamarack, and willow. Marshy spots have abundant sphagnum moss and ferns. Wintergreen is common in more or less wooded places, and blackberry, raspberry, dewberry, and blueberry bushes abound in old fields. Old pasture land has more or less hawthorn, sumac, sweetfern, hardhack, cinquefoil, orange hawkweed or devil's-paintbrush, wild thyme, wild carrot, yellow hawkweed, mullein, black-eyed-susan or yellow daisy, oxeye daisy, thistles, and many other plants. In cultivated fields common weeds include wild mustard, quackgrass, foxtail, chess, crabgrass, and barnyard grass. Poverty oatgrass is widespread on the sour, poor lands. Common grasses are Rhode Island bentgrass, Kentucky bluegrass, Canada bluegrass, meadow fescue, and orchard grass; also such legumes as white clover, white sweetclover, yellow or hop clover, alsike clover, and red clover.

The early history of Albany and Schenectady Counties is coincidental with the earliest settlements that were made in the American Colonies. Before the Pilgrims set foot on the shores of New England, a few hardy Dutch pioneers and traders, as early as 1614, located on the present site of the city of Albany. With a settlement at this point, Fort Orange was constructed for protection against intruders and marauders. Albany was the mother of the first Dutch settlements in the now historic Mohawk Valley. The village of Schenectady was settled in 1662 by the Dutch from Albany. The early pioneers were of Dutch origin, but in time they were augmented by some English and Irish. Old Indian trails, which were used in the opening of the country, passed through Albany and Schenectady to points up the valley of the Mohawk. Consequently these two communities were strategically located for the development of the region.

At first settlement was slow, and little development resulted until about 1664, when the English took over the Dutch settlement. Hostilities and warfare during the Colonial and Revolutionary periods hindered rapid expansion for a number of years. In 1714, 427 white persons and 181 slaves lived in Albany and homesteads were scattered along the Hudson and Mohawk Valleys.

Albany County was incorporated November 1, 1683. The village of Schenectady and the territory now included in Schenectady County remained under the jurisdiction of Albany County until its formation as a separate political unit in 1808.

A large part of the present rural population is composed of descendants of the early Dutch and English settlers. In more recent years, with the development of manufacturing interests in the urban centers, many people of Irish, German, Polish, and Italian nationalities, among others, have come in. Some Italians and Poles are engaged in garden truck farming.

Albany is the county seat of Albany County and the capital of the State. In 1930 it had a population of 127,412. North of Albany are the town of Menands, with 1,522 population; Colonie, 1,176; Watervliet, 16,083; Green Island, 4,331; and Cohoes, 23,226. These towns and adjacent suburban communities, with Troy and Rensselaer across the river in Rensselaer County, comprise a populous district and an active market for agricultural products of the area.

Schenectady is the county seat of Schenectady County and the seat of Union College. In 1930 it had a population of 95,692 and Scotia, its westerly suburb had 7,437 inhabitants. A number of smaller towns are distributed through the two counties.

Both rail and water transportation are highly developed. The Hudson River is navigable for ocean-going vessels as far as Troy; beyond Troy the barge canals extend to Lake Champlain, and the Erie Canal leads westward through Schenectady to Buffalo. Excellent railroad service is afforded by the New York Central system (West Shore and Boston & Albany routes), the Delaware & Hudson Railroad, and the Boston & Maine Railroad. The port of Albany, lately established, is an important discharging and loading center for a wide range of commodities handled by rail and water. Several main paved highways lead from these counties to various parts of the State, and minor highways, some paved, accommodate rural residents and are kept in good condition.

Farm products are marketed in the larger towns, and a large part of them is consumed there. Large markets are established in Albany and Menands.

Churches and schools are ample, and a number of centralized schools are established. Perhaps half the farms have telephone service, and many have electric service, which is gradually being extended.

The industries of the area are centralized chiefly in the cities of Albany and Schenectady. The Federal census of manufactures for 1937 credits Albany with 188 industries employing about 5,215 wage earners. The city has large factories making electric car heaters, door operators, embossed blocks, checkers and dominoes, composition billiard balls, paper products, carbonic acid gas, college caps and gowns, paper maker's felts, and blankets. Other products include car wheels, automobile accessories, clay products, printing, meat packing and food products, plate glass, cigars and tobacco, iron and brass foundry products, and gas meters. Watervliet has a Government arsenal, and Cohoes has textile mills.

In 1937 Schenectady had 100 plants employing 16,060 persons. Here are manufactured steam and electric locomotives, electric lighting and power machinery, electric refrigerators, wiring devices, mica insulators, and a wide variety of electrical equipment.

Brickyards operate along the Hudson and Mohawk Rivers, and quarries southeast of Feura Bush and at South Bethlehem produce crushed limestone for road material and railroad ballast (*11*). Some building stone has been quarried. For some years excavations in the smoother sandy parts of the Albany plain have yielded an excellent grade of molder's sand.

## CLIMATE

The climate of this section, though essentially continental, is tempered to some extent by the influences of the ocean. Winters are cold to fairly severe, with usually ample snowfall. Summers are rather warm, but the heat is seldom depressing for protracted periods.

Differences in elevation, details of relief of the land, and general direction of the wind influence the temperature and the length of the growing season. Thus, the eastern part, where elevations in few places exceed 400 feet above sea level, has a milder winter climate, with less severe wind and somewhat warmer summers with a longer growing season, than does the western part, where altitudes are higher and the topography is rolling, hilly, and even mountainous. Assuming a change of 1° F. for each 300 feet of elevation, the western plateau of the surveyed area would have an average temperature of 5° or 6° lower than the Hudson River Valley (*9*). In the spring farm operations often cannot start on the high plateau for as much as 2 weeks later than on the lowland plain. In the latter section fruit growers recognize that the spring season opens about 10 days earlier in the vicinity of Ravena than it does farther north along the Helderberg bluffs. Prevailing cold northerly spring winds account for the late spring season along the bluffs, whereas the bearing of the bluff line southeasterly to the vicinity of Ravena protects that locality from much of the northerly winds. Some fruit growers in the New Salem-Voorheesville area are favored by fogs, which often overhang from the nearby bluffs to the west.

Tables 1 and 2 summarize climatic data from the records of the United States Weather Bureau stations at Albany and Voorheesville.

Average frost-free seasons range from about 156 days in Voorheesville to 175 days in Albany. These seasons generally are long enough to mature the crops commonly grown.

On the high plateaus the mean annual temperatures average somewhat lower, and on the ridge tops much lower, than on the adjacent valley lands. These differences are reflected in the chance for crops to mature, and, consequently, in farm practices.

The first snowfall or flurries may occur in late October, but more often winter sets in the latter part of November. It continues until April, when the frost disappears sufficiently for farm operations to begin, especially on well-drained lands.

Snowfall averages several inches deeper and remains on the ground longer in the spring on the high plateau than on the eastern lowland. The snow blanket usually is deep enough to protect fall-sown crops and grass from freezing and heaving.

On the average, rainfall is slightly heavier during summer and fall than during the rest of the year and is somewhat heavier for the more elevated parts of the counties. June, July, and August comprise the period of greatest rainfall.

TABLE 1.—*Normal monthly, seasonal, and annual temperature and precipitation at Albany, Albany County, N. Y.*

[Elevation, 97 feet]

| Month | Temperature | | | Precipitation | | | |
|---|---|---|---|---|---|---|---|
| | Mean | Absolute maximum | Absolute minimum | Mean | Total amount for the driest year (1930) | Total amount for the wettest year (1871) | Snow, average depth |
| | °F. | °F. | °F. | Inches | Inches | Inches | Inches |
| December | 28.5 | 67 | −21 | 2.61 | 0.69 | 1.65 | 9.9 |
| January | 23.1 | 71 | −24 | 2.40 | 1.77 | 2.30 | 11.9 |
| February | 24.1 | 66 | −20 | 2.46 | 1.04 | 2.00 | 13.6 |
| Winter | 25.2 | 71 | −24 | 7.47 | 3.50 | 5.95 | 35.4 |
| March | 32.7 | 80 | −8 | 2.62 | 2.76 | 7.29 | 9.6 |
| April | 46.8 | 92 | 9 | 2.46 | 1.53 | 3.79 | 2.1 |
| May | 59.3 | 97 | 29 | 2.90 | 3.02 | 4.97 | (1) |
| Spring | 46.3 | 97 | −8 | 7.98 | 7.31 | 16.05 | 11.7 |
| June | 68.0 | 100 | 40 | 3.37 | 3.21 | 7.25 | .0 |
| July | 72.6 | 104 | 47 | 3.43 | 4.33 | 9.37 | .0 |
| August | 70.8 | 102 | 43 | 3.71 | 2.20 | 10.59 | .0 |
| Summer | 70.5 | 104 | 40 | 10.51 | 9.74 | 27.21 | .0 |
| September | 63.1 | 98 | 32 | 3.11 | 1.96 | .85 | .0 |
| October | 52.1 | 90 | 22 | 2.73 | 1.13 | 3.34 | (1) |
| November | 39.3 | 75 | −11 | 2.78 | 1.90 | 3.38 | 3.3 |
| Fall | 51.5 | 98 | −11 | 8.62 | 4.99 | 7.57 | 3.3 |
| Year | 48.4 | 104 | −24 | 34.58 | 25.54 | 56.78 | 50.4 |

[1] Trace.

TABLE 2.—*Normal monthly, seasonal, and annual temperature and precipitation at Voorheesville, Albany County, N. Y.*

[Elevation, 325 feet]

| Month | Temperature | | | Precipitation | | |
|---|---|---|---|---|---|---|
| | Mean | Absolute maximum | Absolute minimum | Mean | Total amount for the driest year (1930) | Total amount for the wettest year (1938) |
| | °F. | °F. | °F. | Inches | Inches | Inches |
| December | 25.1 | 63 | −23 | 2.30 | 0.84 | 3.73 |
| January | 20.9 | 71 | −25 | 2.19 | 2.55 | 2.32 |
| February | 21.8 | 64 | −21 | 2.37 | 1.15 | 2.04 |
| Winter | 22.6 | 71 | −25 | 6.86 | 4.54 | 8.09 |
| March | 32.2 | 84 | −19 | 2.62 | 2.89 | 1.54 |
| April | 43.7 | 92 | 11 | 2.87 | 1.96 | 2.17 |
| May | 56.2 | 96 | 28 | 2.78 | 2.93 | 2.91 |
| Spring | 44.0 | 96 | −19 | 8.27 | 7.78 | 6.62 |
| June | 65.8 | 97 | 36 | 3.51 | 6.23 | 4.08 |
| July | 70.5 | 103 | 40 | 2.92 | 3.72 | 7.04 |
| August | 68.2 | 99 | 39 | 3.32 | 1.75 | 3.30 |
| Summer | 68.2 | 103 | 36 | 9.75 | 11.70 | 14.42 |
| September | 60.6 | 98 | 29 | 2.68 | 2.26 | 9.96 |
| October | 48.8 | 89 | 15 | 3.09 | 1.29 | 1.00 |
| November | 37.4 | 77 | −8 | 2.68 | 2.00 | 3.09 |
| Fall | 48.9 | 98 | −8 | 8.45 | 5.55 | 14.05 |
| Year | 45.9 | 103 | −25 | 33.33 | 29.57 | 43.18 |

The seasonal climate generally favors the growth, development, and maturity of general staple crops, as well as special crops. Drought or excessive rainfall rarely injures crops.

Sunshiny days outnumber cloudy days during spring and summer. The prevailing winds are from the west for most of the year and seldom are intense enough to cause large damage to crops. Although infrequent, hailstorms sometimes cause considerable local damage.

## AGRICULTURAL HISTORY AND STATISTICS

The earliest settlements in Albany and Schenectady Counties, as stated before, were established in the Hudson and Mohawk Valleys. Here the early pioneers grew such subsistence crops as Indian corn, wheat, flax, and tobacco, raised a few cattle, and supplemented these products by hunting game in the forests (*4*, *5*). Such surplus crops as were obtained were traded or bartered for desired commodities not easily provided at home. As early as 1784, interest in agricultural pursuits was stimulated when an agricultural society was organized and an animal fair for the sale of cattle was held in Albany. Sheep were a source of profit for their meat and wool. By 1785 Albany became the center of a considerable export trade in grain and other products. As time went on, the area of farm lands gradually extended, and, after the country had been exploited for timber, farming reached the hilly sections. For many years general farming and cereal growing prevailed. The increase of population and the development of industrial centers through the eastern parts of the State stimulated dairying, which, in recent years, has dominated the general types of farming. Albany and Schenectady Counties form a part of the milkshed of the State and produce much of the milk shipped to the populous centers. In addition, market gardening near the urban centers of these counties has assumed some importance.

Tables 3 and 4 show the trend of crop production in the area for the last 55 years.

TABLE 3.—*Acreage of the principal crops in Albany County, N. Y., in stated years*

| Crop | 1879 | 1889 | 1899 | 1909 | 1919 | 1929 | 1934 |
|---|---|---|---|---|---|---|---|
| | *Acres* | *Acres* | *Acres* | *Acres* | *Acres* | *Acres* | *Acres* |
| Corn | 11,845 | 7,970 | 10,803 | 9,419 | 5,477 | 1,122 | 2,679 |
| Oats | 30,169 | 27,410 | 23,450 | 21,454 | 16,648 | 5,545 | 9,138 |
| Wheat | 1,652 | 246 | 921 | 495 | 2,839 | 819 | 668 |
| Rye | 14,710 | 17,773 | 15,815 | 10,441 | 9,722 | 900 | 470 |
| Barley | 1,077 | 1,011 | 421 | 525 | 477 | 120 | 126 |
| Buckwheat | 14,774 | 9,790 | 10,970 | 10,638 | 8,660 | 5,354 | |
| Beans | | | 174 | 34 | 217 | 59 | 192 |
| Potatoes | 6,537 | 5,384 | 4,771 | 3,708 | 2,738 | 691 | 996 |
| Hay (all kinds) | 86,738 | 96,616 | 78,232 | 75,792 | 79,070 | 50,986 | 54,017 |
| Timothy and clover mixed | | | | 67,082 | 64,131 | 36,365 | 43,524 |
| Clover alone | | | 966 | 3,182 | 2,294 | 3,357 | 309 |
| Alfalfa | | | 39 | 145 | 1,124 | 2,222 | 1,521 |
| Other tame grasses | | | 76,484 | 5,074 | 10,908 | 8,363 | [1] 8,302 |
| Corn for silage | | | | | 2,085 | 2,545 | [2] 4,626 |
| Market vegetables | | | | | 3,550 | 4,286 | 7,090 |

[1] Includes wild grasses.
[2] Corn for all purposes other than grain.

TABLE 4.—*Acreage of the principal crops in Schenectady County, N. Y., in stated years*

| Crop | 1879 | 1889 | 1899 | 1909 | 1919 | 1929 | 1934 |
|---|---|---|---|---|---|---|---|
| | *Acres* | *Acres* | *Acres* | *Acres* | *Acres* | *Acres* | *Acres* |
| Corn | 5,667 | 3,480 | 4,621 | 3,476 | 1,709 | 390 | 664 |
| Oats | 11,547 | 10,549 | 10.140 | 9,326 | 6,776 | 3,101 | 3,527 |
| Wheat | 823 | 45 | 121 | 19 | 551 | 166 | 147 |
| Rye | 6,348 | 6,164 | 5,283 | 2,591 | 2,533 | 271 | 261 |
| Barley | 1,407 | 633 | 198 | 238 | 232 | 44 | 110 |
| Buckwheat | 4,263 | 2,655 | 4,370 | 4,392 | 2,960 | 2,167 | |
| Beans | | | 237 | 40 | 101 | 31 | 45 |
| Potatoes | 2,298 | 1,791 | 1.501 | 1,135 | 1,004 | 365 | 468 |
| Hay (all kinds) | 32,620 | 43.166 | 33,319 | 30,417 | 34,213 | 19,821 | 22,915 |
| Timothy and clover mixed | | | | 28,796 | 30,985 | 13.591 | 22,071 |
| Clover alone | | | 235 | 1,224 | 750 | 1,896 | 100 |
| Alfalfa | | | | 3 | 52 | 397 | 95 |
| Other tame grasses | | | 32,566 | 290 | 1,499 | 3,751 | [1] 602 |
| Corn for silage | | | | | 1,317 | 1,515 | [2] 2,914 |
| Market vegetables | | | | | 563 | 684 | 1,130 |

[1] Includes wild grasses.

[2] Corn for all purposes other than grain.

These tables show how much more extensive farming was in the earlier years than it is at present. Average per acre yields of the various crops are essentially the same under present systems of management as they were in former years, but each census records a gradual curtailment in acreage for crops in both counties, indicating abandonment of farms, increase of idle land, and retrenchment in areas farmed.

A ride through these two counties, especially the western hilly sections, bears out the facts reported by the census data. Large areas of abandoned land are reverting to a natural cover of trees and wild vegetation. Some localities show deserted farmsteads, many in a tumble-down condition, and the land gives evidence of idleness for a number of years. A correlation between soil types and this condition is indicated in the chapter on Soils and Crops.

The chief crops at present are oats, buckwheat, corn, and hay, but the value of grains, hay, and forage has declined. Dairy farming in recent years has gradually brought about an increased acreage of corn for silage, with the decline of corn for grain, and also an increase in the alfalfa acreage on those soils suitable for this crop. With the exception of a part of the buckwheat crop, most of the grains grown are used as animal subsistence crops and as poultry feed. In the lowland part of the county, apple production has considerable importance and is being maintained profitably. The growing of a variety of market-garden crops on some of the moderately sandy lands is well established and is a thriving business.

TABLE 5.—*Value of agricultural products by classes in Albany and Schenectady Counties, N. Y., in stated years*

| Product | Albany County | | | Schenectady County | | |
|---|---|---|---|---|---|---|
| | 1909 | 1919 | 1929 | 1909 | 1919 | 1929 |
| | *Value* | *Value* | *Value* | *Value* | *Value* | *Value* |
| Forest products | | | $128,937 | | | $48,395 |
| Cereals | $735,404 | $1,405,963 | 229,666 | $302,684 | $485,865 | 114,469 |
| Hay and forage | 1,045,309 | 1,812,382 | 723,618 | 405,288 | 796,599 | 315,700 |
| Vegetables | 560,054 | 1,134,422 | 736,257 | 132,956 | 293,755 | 118,743 |
| Fruits | 466,225 | 670,680 | 353,588 | 86,918 | 99,084 | 84,133 |
| Dairy products sold | 775,777 | 1,405,723 | 1,196,751 | 233,271 | 524,952 | 558,110 |
| Poultry and eggs produced | 425,863 | 744,305 | 1,029,762 | 132,420 | 218,802 | 256,033 |

Dairy and poultry products are growing sources of income. Table 5 compares the value of various agricultural products in Albany and Schenectady Counties. In studying these figures, it should be kept in mind that farm land totals 202,518 acres in Albany County and only 71,837 acres in Schenectady County.

Vegetable growing is an important specialized agricultural industry in the vicinity of the cities of Albany and Schenectady. In 1929 Albany County had 1,053 acres in sweet corn, 646 acres in tomatoes, 419 acres in asparagus, 390 acres in cabbage, and 321 acres in string beans; Schenectady County had 207 acres in sweet corn, 105 acres in tomatoes, 50 acres in asparagus, 85 acres in cabbage, and 52 acres in string beans. In 1934 the acreage of sweet corn was doubled in both counties and the acreages of other vegetables greatly increased. In addition to the vegetables mentioned, peppers, melons, cauliflower, carrots, celery, beets, eggplant, cucumbers, lettuce, onions, and peas are grown. Trucking is practiced on an intensive scale; 269 farms in Albany County and 28 in Schenectady County were classified by the 1930 census as truck farms.

Fruits, chiefly apples, are grown on a commercial scale in several parts of the area. The principal centers for fruit growing in Albany County are in the vicinity of Ravena, Clarksville, New Salem, and Voorheesville; and in Schenectady County, around Niskayuna and East Glenville.

The apple varieties favored are Baldwin, McIntosh, Rhode Island Greening, Wealthy, and Northern Spy. A few others are grown mostly to facilitate pollination. The larger orchardists use much care in cultivating, pruning, spraying, and fertilizing. A few growers have installed cold-storage equipment in order to hold the crop in good condition for advantageous marketing. Bushel crates are finding favor in placing apples on the market. In 1930, 50 farms in Albany County and 21 in Schenectady County received their major income from fruit. The majority of fruit farms range in size from 20 to about 150 acres, and a few are included in holdings up to about 500 acres. Some fruit is grown on general farms, chiefly for home consumption, though some surplus may be sold on local markets. In 1934, 114,608 bushels of apples were harvested from 129,208 trees in Albany County and 24,315 bushels were harvested from 29,780 trees in Schenectady County. In addition to apples, some pears, peaches, plums, and cherries are grown. The value of fruit produced and its contribution to the agricultural wealth of the area can be judged from table 5.

The 1935 census reports 63,622 grapevines producing 249,383 pounds of grapes in 1934, most of which were grown in Albany County. In 1934 strawberries were grown on a total of 74 acres, chiefly in small plots or garden patches. Many farmers include them in their home gardens and sell the surplus in the market. Raspberries and blackberries are also grown.

The growing importance of poultry as a source of agricultural income is emphasized in table 5. In 1930, 182 farms in Albany County and 48 in Schenectady County were classified as poultry farms, that is, farms from which the main income is derived from the sale of eggs and poultry, chiefly chickens. A small part of the income is derived from the sale of ducks, geese, and turkeys. A few farms specialize in turkeys.

Dairying, however, is the substantial industry of most districts. Although some farmers conduct a combination of general, dairy, and livestock farming, they depend chiefly on the production of milk for their major income. In the 1930 census report 591 farms in Albany County and 259 farms in Schenectady County were classified as dairy farms. The majority of dairy farms range in size from 50 to 260 acres, although some farms run as high as 500 to 1,000 acres, and a few average less than 50 acres.

Most of the dairy cattle are good Holstein-Friesian grades maintained for the most part with purebred sires. Guernseys, Jerseys, and Ayrshires are favored on some farms. According to the Federal census, the production of milk in Albany County in 1929 amounted to 5,970,684 gallons, or an average of about 600 gallons a cow. In Schenectady County the production totaled 2,718,890 gallons, with about the same average as in Albany County. Of the quantity produced in Albany County, 4,512,576 gallons, valued at $1,083,018, was sold as whole milk, and 62,215 pounds of cream, valued at $31,730, was sold as butterfat; whereas in Schenectady County 2,106,461 gallons, valued at $505,551, was sold as whole milk, and 350 pounds of cream, valued at $179, was sold as butterfat. Whole milk is sold to nearby urban centers. Creameries and receiving stations are located in Albany, Schenectady, and Amsterdam (in Montgomery County), to which the milk and butterfat are usually taken by motor truck. The 1935 census reported slight increases in the production of milk in both counties in 1934—6,049,663 gallons in Albany County and 2,754,375 gallons in Schenectady County.

Dairy statistics compiled by the New York State Department of Agriculture and Markets (*10*) are interesting in this connection. In Albany County in 1934, 55,120,000 pounds of milk was produced from 10,400 cows and 53,444,000 pounds of milk and 87,600 pounds of cream were received at plants.[3] In Schenectady County in the same year, 24,640,000 pounds of milk was produced from 4,400 cows and 34,476,000 pounds of milk was received at plants. In addition to these sales, some farmers used milk as milk, cream, or butter, or fed the milk to calves.

The roughage fed to cattle consists of silage and hay produced on the farm, but most of the concentrated feeds are purchased.

The development of dairying and large sales of whole milk left no milk byproducts available for feeding hogs; and corn and other crops could not be grown cheaply enough for the purpose. Some swine are raised on many farms to supply home needs, and near the urban centers where garbage and other suitable refuse are available a few swine are raised on a commercial scale. The Chester White breed is favored.

Sheep raising, formerly of some importance, declined, as did hog raising, with increasing interest in the production of milk. Ravages by dogs among sheep, in addition to the direction of effort toward dairying, discouraged sheep raising. Many farms still have small flocks. The sheep are largely grade Shropshires.

Bees also are a source of income, but the receipts from this source in both counties aggregated only $25,510 in 1929.

---

[3] The quantity of milk received at plants includes much produced outside the counties.

Livestock constitutes a large share of the agricultural wealth of these counties. The number and value of domestic animals on farms in 1920, 1930, and 1935 are given in table 6.

TABLE 6.—*Number and value of livestock on farms in Albany and Schenectady Counties, N. Y., in stated years*

| Livestock | Albany County | | | | | Schenectady County | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1920 | | 1930 | | [1] 1935 | 1920 | | 1930 | | [1] 1935 |
| | *Number* | *Value* | *Number* | *Value* | *Number* | *Number* | *Value* | *Number* | *Value* | *Number* |
| Horses | 7,375 | $1,093,488 | 3,663 | $441,677 | 3,770 | 2,820 | $384,912 | 1,149 | $138,375 | 1,453 |
| Cattle | 17,248 | 1,591,959 | 17,058 | 1,421,550 | 16,608 | 7,014 | 615,462 | 7,414 | 615,542 | 7,295 |
| Sheep | 9,789 | 125,616 | 9,586 | 82,643 | 5,484 | 1,746 | 22,932 | 1,544 | 12,936 | 728 |
| Swine | 11,827 | 208,936 | 4,337 | 65,264 | 5,658 | 2,659 | 52,830 | 1,118 | 14,084 | 952 |
| Chickens | [2] 185,723 | 310,911 | 182,990 | 223,248 | 188,923 | [2] 55,768 | 89,704 | 46,408 | 56,618 | 54,288 |
| Bees (hives) | 4,269 | 32,842 | 2,366 | 14,196 | ------- | 919 | 7,919 | 555 | 3,330 | ------- |

[1] Value not reported.
[2] Includes 5,079 and 1,585 other poultry in Albany and Schenectady Counties, respectively.

Income from forest products is derived mainly from the sale of sawlogs, firewood, fence posts, railroad ties, poles, and piling. Although a considerable area is allowed to remain in woodland, only a limited utilization is made of forest resources. About 35 percent of the area in timber serves some use as pasture land. A scrubby second growth of hardwoods makes up the greater part of the woodland. Timber lots on some farms, however, contain a good growth of trees characteristic of the region. In Albany County the area in woods amounts to about 31,000 acres and in Schenectady County about 11,000 acres.

The annual expenditure for commercial fertilizers, including lime, varies according to agricultural prices and economic conditions. The census reports an expenditure of $111,931 for fertilizers on 1,069 farms in Albany County and $28,813 on 427 farms in Schenectady County in 1929. This amounted to approximately $104.71 per farm reporting in Albany County and $67.48 per farm reporting in Schenectady County.

Truck farmers use more commercial fertilizers and spend more per farm for it than other farmers. In Albany County they pay more than one-half of the annual fertilizer bill. Although the general and dairy farmers in Schenectady County spend more than the truck farmers for fertilizer, it is because they greatly outnumber the truck farmers.

The amount of fertilizer applied per acre and the kind used varies with the type of farming, cost, rotation, inclination of the farmer, and the economic situation. The more common formulas of the complete fertilizers are 5–10–5,[4] 4–8–4, 10–20–10, and 2–8–10. Some orchardists use nitrate of soda, and most growers of cereal crops use superphosphate. Some lime is used.

Labor represents one of the big items of expense that confronts the farmer. The total labor bill for the 1,065 farms reporting in Albany County was $544,448 and for 396 farms in Schenectady County $139,063. This represents an average of $511.22 per farm reporting

[4] Percentages, respectively, of nitrogen, phosphoric acid, and potash.

in Albany County and $351.17 per farm reporting in Schenectady County. The wage on truck, general, and dairy farms is about the same, but on specialized types of farms such as poultry, crop-specialty, and fruit farms, the average wage per farm runs somewhat higher.

The more attractive wages offered by industrial concerns in the past have drawn away many farm laborers as well as many farm operators. Even during the recent industrial depression, not much extra farm help has been available, as most of the industrial workers are not qualified by either temperament or experience for farm work. As in the past, a large part of the farm work is still performed by the farmer and members of the family.

Tables 7 and 8, compiled from Federal census data, show the trend in number, size, and tenure of farms.

TABLE 7.—*Number, size, value, and tenure of farms in Albany County, N. Y., in stated years*

| Year | Farms | Operated by— | | | Land in farms | | Improved land in farms | | Average value of all farm property |
|---|---|---|---|---|---|---|---|---|---|
| | | Owners | Tenants | Managers | | | | | |
| | *Number* | *Percent* | *Percent* | *Percent* | *Percent* | *Acres per farm* | *Percent* | *Acres per farm* | *Dollars* |
| 1880 | 3,325 | 79.2 | 20.8 | ---------- | 90.8 | 92.1 | 83.1 | 76.5 | 6,777 |
| 1890 | 3,172 | 71.6 | 28.4 | ---------- | 87.1 | 92.6 | 83.6 | 77.4 | 5,728 |
| 1900 | 3,281 | 70.2 | 28.5 | 1.3 | 88.5 | 91.0 | 82.4 | 75.0 | 4,836 |
| 1910 | 3,146 | 74.6 | 23.3 | 2.1 | 85.9 | 92.1 | 78.3 | 72.1 | 5,640 |
| 1920 | 2,946 | 75.6 | 22.1 | 2.3 | 82.5 | 94.4 | 74.6 | 70.4 | 7,586 |
| 1930 | 1,927 | 87.8 | 10.6 | 1.6 | 60.0 | 105.1 | 68.2 | 71.7 | 10,809 |
| 1935 | 2,204 | 87.4 | 11.7 | .9 | 63.4 | 97.0 | 63.7 | 61.8 | ---------- |

TABLE 8.—*Number, size, value, and tenure of farms in Schenectady County, N. Y., in stated years*

| Year | Farms | Operated by— | | | Land in farms | | Improved land in farms | | Average value of all farm property |
|---|---|---|---|---|---|---|---|---|---|
| | | Owners | Tenants | Managers | | | | | |
| | *Number* | *Percent* | *Percent* | *Percent* | *Percent* | *Acres per farm* | *Percent* | *Acres per farm* | *Dollars* |
| 1880 | 1,397 | 78.4 | 21.6 | ---------- | 95.1 | 89.8 | 84.7 | 76.0 | 5,473 |
| 1890 | 1,266 | 75.9 | 24.1 | ---------- | 88.8 | 92.5 | 84.5 | 78.1 | 4,590 |
| 1900 | 1,194 | 72.8 | 26.8 | 0.4 | 90.7 | 100.1 | 79.8 | 79.9 | 4,683 |
| 1910 | 1,027 | 77.5 | 21.1 | 1.4 | 80.6 | 103.5 | 80.1 | 82.8 | 7,029 |
| 1920 | 983 | 77.1 | 20.3 | 2.6 | 77.8 | 104.3 | 73.9 | 77.1 | 8,803 |
| 1930 | 736 | 88.3 | 10.5 | 1.2 | 54.5 | 97.6 | 70.4 | 68.8 | 10,835 |
| 1935 | 890 | 88.3 | 10.9 | .8 | 64.5 | 95.6 | 67.0 | 64.0 | ---------- |

The marked decrease in number of farms in both counties in the last 55 years has not been compensated by the increase in average size. Much of the land formerly farmed is now included in State forests, is used for reservoirs, or lies idle. Although the average size of farms is slightly less than 100 acres, farms range from as small as 3 acres to as large as 1,000 acres or more. The majority of farms, however, range from 50 to 175 acres. Both counties show an increase in farm ownership and a decrease in tenancy, especially since 1920.

Of the average farm value of $10,809 in 1930 in Albany County, 31 percent of the value was in land, 47 percent in buildings, 11 percent in implements, and 11 percent in domestic animals, with a farm value per acre of $102.84. In Schenectady County at the same time, 32 percent of the average farm value of $10,835 was in land, 47 percent in buildings, 11 percent in implements, and 10 percent in domestic animals, with a farm value per acre of $111.01. Land and buildings alone in 1930 averaged $8,408 per farm and $80.01 per acre in Albany County and $8,516 per farm and $87.25 per acre in Schenectady County. In 1935 the average value of land and buildings fell to $5,500 per farm and $56.72 per acre in Albany County and to $6,233 per farm and $65.22 per acre in Schenectady County. Land values in these counties vary with the type of land, the condition of its improvement, the nearness or remoteness to trading centers, and other economic factors. Well-located and well-improved land commands values of $100 to $150 or more an acre, whereas less well located and less desirable land has a correspondingly lower selling value.

Rental terms for farms may be either on a cash basis or for a share of the crop. Cash rents range from about $2 to $3.50 an acre, the larger number of farms renting for about the former figure. When farms are operated on a share basis, the owner receives one-third to one-half of the crop, depending on how much of the livestock, fertilizers, and tools is provided by each contracting party.

The better equipped farms are provided with modern labor-saving machinery including both horse-drawn and power-driven plows, harrows, cultivators, rollers, cultipackers, manure spreaders, and such harvesting machines as binders, corn harvesters, silage cutters, mowing machines, hay rakes, side-delivery rakes, hay loaders, tedders, and miscellaneous supplementary tools. Most of the dairy farms are well equipped for their purpose, and State requirements set minimum standards for dairy routine. Many barns have water systems and power milkers.

## SOIL SURVEY MEHODS AND DEFINITIONS

Soil surveying consists of the examination, classification, and mapping of soils in the field.

The soils are examined systematically in many locations. Test pits are dug, borings are made, and exposures, such as those in road or railroad cuts, are studied. Each excavation exposes a series of distinct soil layers, or horizons, called collectively the soil profile. Each horizon of the soil, as well as the parent material beneath the soil, is studied in detail; and the color, structure, porosity, consistence, texture, and content of organic matter, roots, gravel, and stone are noted. The reaction of the soil [5] and its content of lime and salts are determined by simple tests.[6] Drainage, both internal and external, and other external features, such as relief, or lay of the land, are taken

[5] The reaction of the soil is its degree of acidity or alkalinity expressed mathematically as the pH value. A pH value of 7 indicates precise neutrality; higher values indicate alkalinity, and lower values indicate acidity.

[6] The total content of readily soluble salts is determined by the use of the electrolytic bridge. Phenolphthalein solution is used to detect a strong alkaline reaction.

into consideration, and the interrelation of soils and vegetation is studied.

The soils are classified according to their characteristics, both internal and external, special emphasis being given to those features influencing the adaptation of the land for the growing of crop plants, grasses, and trees. On the basis of these characteristics soils are grouped into mapping units. The three principal ones are (1) series, (2) type, and (3) phase. Areas of land, such as coastal beach or bare rocky mountainsides, that have no true soil, are called (4) miscellaneous land types.

The most important group is the series, which includes soils having the same genetic horizons, similar in their important characteristics and arrangement in the soil profile, and developed from a particular type of parent material. Thus, the series includes soils having essentially the same color, structure, and other important internal characteristics and the same natural drainage conditions and range in relief. The texture of the upper part of the soil, including that commonly plowed, may vary within a series. The soil series are given names of places or geographic features near which they were first found. Thus, Hudson, Albia, and Cossayuna are names of important soil series in these counties.

Within a soil series are one or more soil types, defined according to the texture of the upper part of the soil. Thus, the class name of the soil texture, such as sand, loamy sand, sandy loam, loam, silt loam, clay loam, silty clay loam, and clay, is added to the series name to give the complete name of the soil type. For example, Copake loam and Copake fine sandy loam are soil types within the Copake series. Except for the texture of the surface soil, these soil types have approximately the same internal and external characteristics. The soil type is the principal unit of mapping, and because of its specific character it is usually the soil unit to which agronomic data are definitely related.

A phase of a soil type is a variation within the type, which differs from the type in some minor soil characteristic that may have practical significance. Differences in relief, stoniness, and the degree of accelerated erosion are frequently shown as phases. For example, within the normal range of relief for a soil type there may be areas that are adapted to the use of machinery and the growth of cultivated crops, and others that are not. Even though there may be no important difference in the soil itself or in its capability for the growth of native vegetation throughout the range in relief, there may be important differences in respect to the growth of cultivated crops. In such an instance the more sloping parts of the soil type may be segregated on the map as a sloping or hilly phase. Similarly, soils having differences in stoniness may be mapped as phases, even though these differences are not reflected in the character of the soil or in the growth of native plants.

The soil surveyor makes a map of the county or area, showing the location of each of the soil types, phases, and miscellaneous land types, in relation to roads, houses, streams, lakes, section and township lines, and other local cultural and natural features of the landscape.

300781—42——2

## SOILS AND CROPS

For convenience of discussion the soils of Albany and Schenectady Counties are arranged in four groups, as follows:

(1) Soils of the Hudson Valley comprise two subgroups: (a) Soils developed from glacial till—Cossayuna, Nassau, Manlius, Hornell, Albia, Boynton, and Mansfield soils; and (b) soils developed on outwash plains, lake-laid terraces, and kames—Chenango, Braceville, Schodack, Copake, Colonie, Hoosic, Granby, Hudson, Orono, Claverack, Wauseon, and Livingston soils.

(2) Soils developed from glacial deposits of the Appalachian Plateaus and Valleys comprise five subgroups: (a) Deep well-drained soils—Pittsfield, Wooster, and Poland soils; (b) shallow well-drained soils—Farmington, Lordstown, Angola, and Lackawanna soils; (c) imperfectly drained soils—Langford, Canfield, Culvers, Schoharie, Erie, and Volusia soils; (d) poorly drained soils—Chippewa, Norwich, Lyons, and Allis soils; and (e) steeply sloping soils—steeply sloping areas of the Poland, Lackawanna, Lordstown, Langford, and Culvers soils.

(3) Soils of the flood plains comprise three subgroups: (a) Well-drained alluvial soils—Genesee and Tioga soils; (b) imperfectly drained alluvial soils—Eel and Middlebury soils; and (c) poorly drained alluvial soils—Wayland soils.

(4) Miscellaneous soils and land types comprise alluvial soils, undifferentiated, peat, muck, rough stony land (Farmington soil material), rough stony land (Lordstown soil material), and made land.

In the following pages the soils of Albany and Schenectady Counties are described in detail, and their agricultural relationships are discussed; their location and distribution are shown on the accompanying soil map; and their acreage and proportionate extent are given in table 9.

### SOILS OF THE HUDSON VALLEY

In general, the soils of the Hudson Valley are more productive than the soils of the Appalachian Plateaus that embrace the western parts of the area. The parent materials of the lowland soils have moderate supplies of lime, and the lower elevation gives a milder climate with a slightly longer growing season. The rather wide range in soil characteristics, together with the nearness of ready markets, favors the profitable production of many different crops. Some of these soils are developed from glacial till deposits and some from glacial outwash and lacustrine deposits.

#### SOILS DEVELOPED FROM GLACIAL TILL

The soils developed from glacial till include Cossayuna silt loam; Cossayuna silt loam, shallow phase; Nassau shaly silt loam; Manlius shaly silt loam; Hornell silty clay loam; Albia silt loam; Boynton clay loam; and Mansfield silt loam. Because of their shallowness, these soils generally are of low productivity and of low moisture-holding and low plant nutrient-retaining capacities. The light-colored Cossayuna soils have many smooth areas that are being cultivated with some success; elsewhere the thinner solum and occasional rock exposures detract from their value. The Nassau soil is darker than the Cossayuna soils, and its thin soil mantle over the shaly or slaty rocks limits its value for crops.

TABLE 9.—*Acreage and proportionate extent of the soils mapped in Albany and Schenectady Counties, N. Y.*

| Soil type | Acres | Per-cent | Soil type | Acres | Per-cent |
|---|---|---|---|---|---|
| Cossayuna silt loam | 9,664 | 2.1 | Angola silt loam | 2,624 | 0.6 |
| Cossayuna silt loam, shallow phase | 3,328 | .7 | Lackawanna silt loam | 7,488 | 1.6 |
| Nassau shaly silt loam | 3,456 | .7 | Langford gravelly silt loam | 24,960 | 5.3 |
| Manlius shaly silt loam | 6,144 | 1.3 | Canfield silt loam | 15,040 | 3.2 |
| Hornell silty clay loam | 5,888 | 1.3 | Culvers silt loam | 8,448 | 1.8 |
| Albia silt loam | 15,040 | 3.2 | Schoharie silt loam | 2,368 | .5 |
| Boynton clay loam | 6,720 | 1.4 | Erie silt loam | 45,120 | 9.6 |
| Mansfield silt loam | 896 | .2 | Volusia silty clay loam | 2,752 | .6 |
| Chenango gravelly silt loam | 10,368 | 2.2 | Chippewa silt loam | 17,536 | 3.7 |
| Braceville silt loam | 2,176 | .5 | Norwich silt loam | 576 | .1 |
| Schodack gravelly loam | 1,408 | .3 | Lyons silt loam | 704 | .2 |
| Copake loam | 384 | .1 | Allis silt loam | 6,400 | 1.4 |
| Copake very fine sandy loam | 576 | .1 | Poland silt loam, steep phase | 128 | (1) |
| Copake cobbly loam | 1,024 | .2 | Lackawanna stony silt loam, steep phase | 640 | .1 |
| Copake fine sandy loam | 2,944 | .6 | Lordstown silt loam, steep phase | 12,800 | 2.7 |
| Copake cobbly sandy loam | 1,344 | .3 | Langford gravelly silt loam, steep phase | 8,064 | 1.7 |
| Colonie gravelly sandy loam | 3,456 | .7 | Culvers silt loam, steep phase | 3,648 | .8 |
| Hoosic loamy coarse sand | 6,336 | 1.4 | Genesee silt loam | 3,840 | .8 |
| Colonie loamy fine sand | 22,400 | 4.8 | Genesee silt loam, high-bottom phase | 192 | (1) |
| Granby loamy fine sand | 2,816 | .6 | Genesee fine sandy loam | 2,496 | .5 |
| Hudson silty clay loam | 15,296 | 3.3 | Tioga silt loam | 5,312 | 1.1 |
| Hudson clay | 384 | .1 | Tioga silt loam, high-bottom phase | 192 | (1) |
| Hudson silt loam | 3,712 | .8 | Eel silt loam | 2,688 | .6 |
| Claverack fine sandy loam | 13,248 | 2.8 | Middlebury silt loam | 11,008 | 2.4 |
| Claverack fine sandy loam, deep phase | 14,144 | 3.0 | Wayland silt loam | 1,920 | .4 |
| Wauseon fine sandy loam | 1,472 | .3 | Alluvial soils, undifferentiated | 2,048 | .4 |
| Orono silt loam | 2,240 | .5 | Peat | 320 | .1 |
| Orono silty clay loam | 832 | .2 | Muck | 1,088 | .2 |
| Livingston silty clay loam | 2,048 | .4 | Muck, shallow phase | 576 | .1 |
| Livingston silt loam | 1,152 | .2 | Rough stony land (Farmington soil material) | 1,280 | .8 |
| Hudson silt loam, broken phase | 11,136 | 2.4 | Rough stony land (Lordstown soil material) | 2,688 | .6 |
| Colonie loamy fine sand, broken phase | 3,456 | .7 | Made land | 4,224 | .9 |
| Colonie fine sand, rolling phase | 7,360 | 1.6 | Quarries | 64 | (1) |
| Pittsfield silt loam | 11,008 | 2.4 | Total | 469,120 | |
| Wooster silt loam | 5,632 | 1.2 | | | |
| Poland silt loam | 768 | .2 | | | |
| Farmington silt loam | 15,488 | 3.3 | | | |
| Lordstown silt loam | 54,144 | 11.6 | | | |

[1] Less than 0.1 percent.

Manlius shaly silt loam occupies relatively low positions, as does Albia silt loam. The predominantly shaly soil materials are well drained, but the productivity is low. Hornell silty clay loam, likewise developed from shaly material, differs from the Manlius soil in having a dense impervious clay layer, which causes deficient drainage over the rock, thus limiting the use of this soil for cultivated crops.

The Albia and Boynton soils are imperfectly drained and occur largely in the inner part of the lowland, in the northern part of Albany County, and in the southeastern part of Schenectady County. Normally, they are associated in areas of drumlinlike hills. Albia silt loam, because of its higher position, is better drained than Boynton clay loam, which lies on gentle slopes. Both soils are well suited for grass and some of the clovers. Owing to its better drainage, the Albia soil is better suited than the Boynton for such tilled crops as corn, small grains, potatoes, and root crops. Alfalfa, a deep-rooted crop, is not well adapted to Albia silt loam with its dense subsoil and is not at all adapted to Boynton clay loam with its imperfect drainage and dense subsoil.

The Mansfield soils, associated with the Albia and Boynton soils, are poorly drained. They are used mostly for pasture, where not timbered.

**Cossayuna silt loam.**—Areas of Cossayuna silt loam are scattered throughout the northeastern part of Albany County and the eastern part of Schenectady County in association with areas of the Albia and Boynton soils.

The surface soil consists of light-brown or medium grayish-brown friable silt loam or gritty silt loam. Below a depth of 6 or 7 inches the material is light-brown or yellowish-brown firm but friable silt loam becoming paler with increase in depth. At a depth of 20 to 22 inches the material grades into light-brown or light grayish-brown moderately compact silt loam. In places this material is stained or slightly mottled with yellow, brown, or gray. Varying but small, limited quantities of angular sandstone and shale gravel fragments, together with some granitic and quartzite fragments, generally are present. The material in the upper layers is nearly everywhere acid in reaction, and the subsoil and substratum are, in places, slightly alkaline or neutral. Shale and shaly sandstone bedrock in few places lies less than 3 feet and generally is from 5 to 6 feet below the surface.

Drainage is well established for the most part. The surface is more or less rolling, with drumloid and sloping forms.

A large part of this land has been cleared and at some time has been cultivated. At present much of it is under grass cover as mowing, pasture, or idle land. Many areas are cultivated successfully to the general crops of the area.

**Cossayuna silt loam, shallow phase.**—The shallow phase of Cossayuna silt loam occurs principally in the northern part of Schenectady County west and northwest of Glenville. Areas are along the river northeast of Schenectady, north of Latham, and elsewhere.

This soil resembles Lordstown silt loam but differs from it in having some diverse rock materials in its make-up. The underlying rock contains sufficient calcium carbonate to effervesce with hydrochloric acid. Normally the position of this soil is lower than that of the Lordstown soils.

Characteristically, this soil has a surface layer, about 7 inches thick, of dark grayish-brown or grayish-brown friable silt loam. This rests on light-brown firm but friable silt loam, which becomes more yellow and grades, at a depth of 12 to 14 inches, into yellowish-brown friable silt loam. This material, in turn, rests, at a depth of about 30 inches, on thinly stratified gray sandstone. In many places a layer, only a few inches thick, consisting of grayish-yellow compact silty material stained and mottled with gray and brown, immediately overlies the bedrock. The depth of soil material ranges from a few inches to 36 or more inches. In places the soil contains a greater or less quantity of shale chips and a moderate quantity of granitic and other crystalline gravel and boulders, the larger ones having been removed to fence rows from cultivated fields. The soil is acid throughout, but the underlying rock is prevailingly calcareous. In general, the surface is smooth, but in places it ranges from moderately sloping to gently rolling. Drainage is well established.

About 15 percent of the land is in regular cultivation, 50 or 60 percent is more or less cleared and used for pasture or occasional mowing land, and the rest is in timber, largely of hardwoods. The general productiveness appears about the same as that of the Lordstown soils. Farming conditions in areas where this soil predominates do

not appear very prosperous. Crops usually show but moderate growth, and yields are low. Pastures and old grassland contain many weeds and undesirable plants, such as poverty oatgrass, goldenrod, cinquefoil, briers, and wild aster. Bentgrass, timothy, and white clover are the more desirable volunteer species. It is probable that alfalfa, when once established, would thrive when the roots have reached into the calcareous soil material in the rock fissures.

**Nassau shaly silt loam.**—Nassau shaly silt loam forms a narrow belt of detached areas, most of them not more than one-half mile wide, on the ridge fronting the Hudson River south of Albany and on the low plain on which Watervliet and Cohoes are situated. A few small areas are northeast of Latham. This thin soil overlies dark-gray thinly laminated badly contorted shale and slate beds.

The soil mantle ranges in depth from a thin coating to 2 feet or more over the bedrock. Rock outcrops are common. In representative areas, the surface soil consists of dull grayish-brown friable silt loam containing an appreciable quantity of finely divided shale. It is underlain, at a depth of about 6 inches, by brownish-yellow smooth firm but moderately friable silt loam or silty clay loam. This rests on shale bedrock at a depth of about 20 inches. The reaction throughout the soil is acid, but observations in several places indicate that the shale beds are somewhat calcareous at a depth ranging from 4 to 6 feet.

Probably less than 1 percent of this land is used for crop production. The thin soil mantle, numerous rock exposures, and knolly surface limits its agricultural usefulness. Drainage is well established, and the shallower areas are rather droughty. Sloping areas have been eroded.

Many areas have been cultivated in the past, but most of the land is now in pasture, or, where sufficiently smooth, may be mowing land. Pastures contain much poverty oatgrass, some spirea, hawkweeds, and better species, such as Canada bluegrass, bentgrass, white clover, and timothy. Such trees as elm, red oak, hickory, sumac, and dogwood are common.

**Manlius shaly silt loam.**—Manlius shaly silt loam occurs almost entirely in the western parts of the Hudson Valley, where it is associated with Hornell silty clay loam and other soils. The larger areas are just north of Scotia and northwest of Glenville Center.

Manlius shaly silt loam is a shallow soil with little profile development. It has a 4- to 6-inch surface soil of light-brown or grayish-brown friable silt loam containing a moderate quantity of small shaly fragments. Underneath this is yellow, yellowish-brown, or brownish-yellow heavier but friable silt loam, which rests on shale bedrock at a depth ranging from 15 to about 30 inches. In places there is a thin layer of yellowish-gray residual silty clay loam or clay over the shale. The stony fragments through the soil layers are chiefly small pieces of shale, but fragments of sandstone, granite, gneiss, and other foreign rocks are also scattered over and throughout the material.

This soil differs from Lordstown silt loam in that the soil is developed almost entirely from underlying deep beds of shales, the upper part of which was eroded by glacial action. The reaction is acid to ordinarily observable depths.

Drainage water readily percolates through the soil, but the moisture-holding capacity is slightly higher than that of the Lordstown soil. This soil is also somewhat more silty than the Lordstown soil. The surface ranges from smooth to slightly uneven and broken.

Manlius shaly silt loam has little importance in the agriculture of the area because of the low yields of crops it produces. Only a few small areas are under cultivation; the rest of the land remains in pasture or is wasteland. Some of the areas of deeper soil are used for hay, oats, corn, and buckwheat, which return comparatively low yields. Pastures support a sparse growth of grasses, and their value is further reduced by encroaching weedy plants.

Farmers recognize this soil as one of low fertility, and they make little effort to improve its productivity. The areas are used principally for pasture and hay or for wood lots.

**Hornell silty clay loam.**—Most of this soil is mapped in Schenectady County, and the rest is mapped in small scattered bodies in the northern and northwestern parts of Albany County. The largest areas are north of Scotia along the eastern slope of Glenville Hill. Most of the soil is in the Hudson Valley, but some areas are on the Appalachian Plateaus.

In wooded areas a thin irregular layer of leaves, twigs, and leaf-mold covers the soil. The content of humus has darkened the upper part of the soil so that the topmost 1 to 3 inches is medium dark grayish-brown slightly granular light silty clay loam. Below this is brownish-yellow, yellowish-gray, or yellow gritty shaly light silty clay loam, which extends to a depth ranging from 10 to 15 inches. The lower part of this layer in some spots, depending on local drainage conditions, is slightly streaked with gray and mottled with brown. This material passes abruptly into smooth heavy shaly clay variously colored with shades of gray and rusty brown. Partly weathered shale fragments are present in this layer. On drying, the soil breaks into cloddy particles the outsides of which have a glossy, waxy appearance. The clay material is weathered largely from underlying beds of gray shale, which occur at depths ranging from 20 to 35 inches.

In cultivated fields the surface soil varies from shades of gray to grayish brown. Slightly depressed areas and shallow basins are grayer and duller in color than spots situated in somewhat better drained positions.

The land has little relief. It is slightly uneven or smooth, ranging from level to gently sloping. Drainage is adequate in the upper part of the soil, but in the lower part it is restricted by the heavy clay horizon.

This soil is cultivated but little. In places a few small scattered level fields have been selected for cultivation. When farmed, they are used to grow the ordinary crops of the area, but returns do not justify an extended use of this land. Yields are generally below the average for the area. A large acreage is utilized for pasturing cattle and for hay. Little attention, however, is given to managing pasture; consequently, much of the pasture land is weedy and the growth of desirable palatable pasture grasses is scattered and sparse. The undeveloped condition of this soil indicates that past cultivations have not produced results sufficient for continued farming.

The most practical use of this soil under prevailing economic conditions is for grazing, hay, and woodland.

**Albia silt loam.**—Albia silt loam occurs in the Hudson Valley, chiefly within Albany County. Much of it lies in the western part of this physiographic division, with some areas in the northeastern part of Albany County and in the eastern part of Schenectady County. It is developed normally on the higher, smoothly rounded hills of drumlin form, which lie in parallel arrangement, with their axes in north and south directions.

The topmost 7 or 8 inches of the surface soil is light-brown or grayish-brown friable silt loam. This is underlain to a depth of about 15 inches by yellow or light yellowish-brown friable silt loam. Below this is slightly more compact yellowish-brown silt loam somewhat mottled or stained with yellow and rusty brown. Compact brittle gritty silt loam or silty clay loam lies at an average depth of 20 to 22 inches. This material approaches a hardpan condition and is mottled variously with yellow, rust, yellowish gray, and shades of brown. It grades into tightly compact gritty till material that is distinctly mottled brown, yellow, and gray and extends downward many feet. On the surface and through the soil are moderate and varying quantities of angular and rounded gravel and small stones, of grayish sandstone, quartzite, some limestone, and considerable shale. The upper friable soil layers are acid, whereas the harder subsoil, in places, is alkaline in the upper part and is almost everywhere alkaline at a depth of 3 or 4 feet. Many of the areas mapped in northeastern Albany and eastern Schenectady Counties have somewhat sandy surface soils presenting essentially a fine sandy phase. These areas appear to have received sand from adjacent sandy soils through wind action. In such places the subsoil is somewhat less dense and a little better drained than elsewhere.

Surface drainage is good, but the hard subsoil impedes internal drainage. Some of the surface is sufficiently sloping to have induced severe sheet erosion and, in places, gully erosion.

Although Albia silt loam of the Hudson Valley resembles the Canfield and Langford silt loams of the Appalachian Plateaus, its agricultural value is higher because it lies in a section having a more favorable climate and is nearer the market.

This is a fairly extensive soil. Probably 80 percent of it has been cleared and at some time has been cultivated, though at present considerable areas are in pasture or mowing. Perhaps 25 to 30 percent is cultivated. General subsistence crops are grown, and average yields of corn, oats, buckwheat, and hay are obtained. When the soil is in good tilth, clover makes a good stand, but lime must be applied once in a rotation in order to insure clover stands. Old fields and land long pastured support much poverty oatgrass, bentgrass, Canada bluegrass, and various weedy plants. Most of the areas appear to have been more intensely farmed in past years. A few apple orchards appear to be in good condition.

**Boynton clay loam.**—Boynton clay loam is generally associated with Albia silt loam on the lower slopes and intervening depressions between the drumlinlike ridges.

The surface soil, to a depth of about 6 inches, is grayish-brown or dark grayish-brown moderately friable clay loam or gravelly clay

loam, which tends to crack on drying. This grades into brownish-yellow compact clay loam, more or less mottled with rusty brown, slate blue, and gray, especially below a depth of 10 to 12 inches. Between a depth of 12 to 14 inches and about 24 inches is a dense brittle gritty moderately well developed clay loam hardpan that is dull brownish gray mottled with brown and very dark gray, with brown and gray variations. This material grades into gray, bluish-gray, or brownish-gray compact gritty clay loam glacial till. The surface soil is acid, and the subsoil layers and the substratum are alkaline. Pieces of gray and blue sandstone gravel and chips of shale occur throughout the soil.

The surface is smooth, sloping, or somewhat undulating. Surface drainage is fair, but the hard subsoil makes underdrainage deficient.

Perhaps 75 percent of this land is cleared and is potentially arable; the rest is in hardwood timber tracts. The land is utilized extensively for pasture and mowing. A few areas are selected on which to grow subsistence and feed crops. Corn produces poor stands, and yields of oats, buckwheat, and millet are only fair. Grass seems best adapted, and hay (timothy, bentgrass, and Canada bluegrass) often yields from 1 to 1½ tons an acre. Alsike clover grows well in places, but alfalfa, being a deep-rooted crop, does not succeed well with so dense a subsoil. Old pastures and run-down mowings contain much poverty oatgrass, wild carrot, buttercup, and other weedy plants. The land is not well suited for apple orchards.

**Mansfield silt loam.**—Mansfield silt loam occupies several small scattered areas, most of them very narrow strips, representing depressions between ridges and slopes occupied by the Albia and Boynton soils in the Hudson Valley. A few areas are somewhat broader than the typical ones.

The surface soil is dark-gray granular silt loam, 6 to 8 inches thick, which grades into mottled gray, yellowish-gray, and rusty-brown firm silt loam or light silty clay loam. This gives way, at a depth of 20 to 24 inches, to gray and bluish-gray heavy compact glacial till. Varying quantities of angular sandstone gravel and platy fragments together with some shale, are on the surface and mixed with the soil material. Drainage is poor, and in wet seasons water may stand on the surface for considerable periods.

This soil is too poorly drained for cultivated crops, and practically all of it is used for pasture and mowing or supports such growth as alder, willow, soft maple, white birch, and river birch, together with ferns and coarse reedy grasses, The better drained areas would have some value for buckwheat, oats, and similar crops.

#### SOILS DEVELOPED ON OUTWASH PLAINS, LAKE-LAID TERRACES, AND KAMES

Some of the soils developed on outwash plains, lake-laid terraces, and kames have gravelly and sandy substrata, and the rest are formed from silty and clayey lacustrine deposits.

The soils with gravelly and sandy substrata are the generally level and well-drained Chenango, Copake, Hoosic, and Colonie soils, and the generally broken or hilly Schodack soils of kames. These soils are rather widespread over the Hudson Valley, especially in the eastern part. Most of these soils have light-textured surface

soils over gravelly or sandy subsoils. The Copake, Colonie, and Schodack soils are acid within easily observed levels but normally are neutral to alkaline at depths of about 5 feet. Nearly all of them are used for most of the cultivated crops, but their light texture and excessive drainage make them less suitable for pasture or hay grasses. Although their natural fertility is not high, they respond well to fertilization and can be worked under a wider range of moisture conditions than can soils of heavier texture. Many different market-garden crops and some alfalfa are grown successfully, and on the heavier textured soils of the group many apple orchards are maintained successfully.

The Braceville soils generally are associated with the Chenango soils. They are imperfectly drained because of a dense layer over the generally gravelly lower subsoil layer and are only moderately productive.

The Schodack soils are on very uneven terrain, are variable in soil characteristics, and are excessively drained and droughty. Where limy materials lie only a few feet below the surface, these soils have some value for alfalfa.

Those terrace soils having clayey substrata—the Hudson, Orono, Claverack, Wauseon, and Livingston soils—are inherently fertile, but their productiveness varies with their texture and ease of drainage. The heavier textured members, for the most part, occupy level land, remain damp and cold late in the spring, and generally are rather difficult to handle. The clay substrata contain more or less free lime, which favors the growth of leguminous crops. They are well suited for grass and small grains and are therefore adapted for dairying. This applies to Hudson silty clay loam, Hudson clay, and the Orono soils. The Livingston and Wauseon soils are less well drained but furnish fairly good pasture and in favorable seasons produce good yields of small grains and even good yields of corn. Soils having a layer of sand over the clay, such as the Claverack soils, provide excellent conditions for retention of an optimum quantity of soil moisture, and the loose sandy soil favors easy tillage. The Claverack soils are used successfully for the general crops of the area and are regarded highly for special truck crops. These heavier textured soils are fairly well distributed over the Hudson Valley, especially along the eastern and middle parts.

The broken phase of Hudson silt loam is not suited for cultivation but has some value as pasture. Colonie loamy fine sand, broken phase, and Colonie fine sand, rolling phase—both loose sandy soils—have little value because of their rough surface and droughty character.

**Chenango gravelly silt loam.**—Chenango gravelly silt loam is distributed in rather small bodies in stream-terrace positions along some of the streams of the Appalachian Plateaus and as outwash plains in the inner part of the Hudson Valley. The largest areas are just west of Voorheesville and north of Guilderland Center. Some occur in the vicinity of South Bethlehem, Princetown, along Fox Creek and its tributaries, and along the larger streams of southern Albany County. The total area is fairly large.

Typically, the 7-inch surface layer consists of dark-brown or medium grayish-brown gritty gravelly silt loam. It is underlain by brownish-yellow, yellowish-brown, or yellow gritty gravelly silt

loam of moderately loose structure. At a depth of about 20 inches this material grades into light-brown or brown loose rather incoherent gravelly loam or gravelly silt loam, which rests at a depth of about 30 inches on light-brown gravelly pebbly loose loamy material. Below the loamy material are beds of more or less stratified gravel and sand. The depth to the gravelly subsoil varies from place to place, in some places being as much as 36 inches. Here and there some compaction of the layers just above the gravel is apparent.

On the surface and throughout the upper layers are normally considerable but variable quantities of rounded and partly rounded gravel and cobbles of sandstone and shale. In places there are boulders from 1 to 2 feet in diameter. Most of the larger cobbles and rock fragments have been removed from cultivated areas. The more noticeably gravelly areas are indicated by symbols on the map. The soil material to a depth of 4 or 5 feet is strongly to medium acid in reaction. In several of the few places observed below these depths the gravelly material is incrusted with lime, and a small part of the gravel is composed of limestone.

In some places, for example 2 miles northwest of South Berne, 1½ miles southwest of Berne, and 1 mile southwest of Meadowdale, are small areas where the soil is developed on alluvial fans formed from materials washed from local hills and deposited by tributary streams at points where they emerge from the hills and join the main valleys. Here the gravel is more platy and angular and the profile is more variable than in the broader more typical areas. Much of this variation is somewhat more gravelly and more difficult to work than is typical Chenango gravelly silt loam.

In southwestern Albany County, mostly along Catskill Creek, are a few small detached terrace areas, the soil materials of which were deposited from the adjacent ruddy-brown and reddish-brown upland soils. This included soil is, in reality, a light reddish-brown phase of Tunkhannock gravelly silt loam but is not classified separately in this area because of its small extent. The surface soil is light-red or brownish-red more or less gravelly light loam or gritty silt loam, containing moderate quantities of organic matter. Below the usual plow depth is light brownish-red friable gravelly loam, which grades at a depth below 20 to 24 inches into light brownish-red loamy fine gravel. The soil material is acid throughout. Some of this land is used with moderate success for general farm crops, orchards, and pasture.

Throughout the various areas of the normal Chenango gravelly silt loam a fairly definite color profile is developed, including a surface soil of dark shades of brown, a yellowish-brown subsurface layer, and a brownish-yellow subsoil. The soil is moderately loose, open, and porous because of its gravelly substrata.

Drainage is thorough, in many places excessive, with the result that vegetation may suffer in dry seasons. Well-timed cultivations are important to conserve as much of the moisture as possible. The ready drainage allows field operations to begin early in spring.

The surface ranges from nearly level to somewhat undulating or gently sloping. Some of the margins of the terraces are rather steep and, in places, are gullied.

Chenango gravelly silt loam is a well-drained moderately productive soil suitable for a variety of agricultural uses. Some of the smaller, narrower, and more stony areas are kept in timber or wooded pastures. Approximately 25 percent of the land is under such cover, and the rest is in tillable pasture or is cultivated. General farming and dairying are the leading types of farming. The common crops are corn, oats, and buckwheat, and occasionally wheat, potatoes, timothy, and clover are grown. Some farmers have successfully established stands of alfalfa, although more reliance is placed on clover for hay. Once started, alfalfa should grow well, especially after the roots have penetrated into the somewhat calcareous substrata. Yields of crops vary with the treatment the land has received. Land of this type, when brought to a good stage of productivity, returns yields of 6 to 8 tons of silage corn, about 40 bushels of oats, and 1½ to 2 tons of hay. In a few locations, thrifty and productive apple orchards have been established and some pears and berries are grown. Some truck crops, such as cabbage and tomatoes, are grown successfully.

**Braceville silt loam.**—Braceville silt loam occupies a few isolated high benches and low terraces in some of the broader valley areas, mostly in Schenectady County and in the northwestern part of Albany County.

The 7- or 8-inch surface layer consists of dull grayish-brown or brownish-gray rather mellow smooth silt loam. Beneath this and extending to a depth of 1 foot or more is light-gray or grayish-yellow firm, in many places platy, silt loam, stained or somewhat mottled with rusty yellow and rusty brown. This material is underlain by heavy moderately compact brownish-gray silt loam variously mottled with yellow, gray, and dull brown. The lower part of the subsoil consists of smooth silt loam, in many places interbedded with fine and very fine sandy material marked with varying shades of dull gray, yellow, and dull brownish yellow.

Although the soil materials in the main are silty, many irregular layers and pockets of heavier textured material, such as silty clay loam or clay, influence the soil's structural and drainage properties. As a whole, drainage is deficient, but it varies somewhat from place to place. The reaction for the most part is acid throughout.

The surface is nearly level but is varied by slight irregularities or ridges. In the higher areas the water table is lower and the color is browner than elsewhere.

A few wood lots cover a small part of Braceville silt loam. These include second-growth hickory, pine, hemlock, elm, ash, aspen, maple, and poplar. Cleared areas are devoted principally to pasture and hay. A small acreage is cultivated for oats, corn, and buckwheat. Alfalfa has been established in a few places, but the growth is uneven, thin, and spotted because of the imperfect drainage.

Although yields fluctuate from season to season according to drainage and seasonal variations, they generally are somewhat below the average for the area. This soil is considered moderately productive, and its largest acreage is in hay or meadow land.

**Schodack gravelly loam.**—Schodack gravelly loam occurs mostly in small widely scattered bodies, especially north of Albany. Representative areas are just west of Glenville, just west of Loudonville,

and about 3 miles west of Voorheesville. This soil represents a condition resulting from variable movements of glacial outwash waters, and it is generally associated with the more nearly level Chenango and Copake soils. The surface is rough, and areas of the soil present a conspicuous feature of the landscape. Round pitted depressions, or kettle holes, that have no surface drainage outlets are common.

Owing to the irregular surface and the variable deposition of soil material, the textures and arrangement of the soil materials vary considerably with the character of the adjacent associated soils. For instance, the area near Loudonville is prevailingly sandy, whereas the areas west of Voorheesville consist more nearly of gravelly loam. A wide range of soil characteristics exists within short distances. In representative areas the soil has a surface soil, about 6 inches thick, of grayish-brown gritty gravelly loam underlain by yellow or brownish-yellow pebbly gritty coherent loam, and, between depths of about 20 and 40 or more inches, stratified or cross-bedded layers of grayish-yellow and yellowish-gray generally loose incoherent coarse sands, pebbles, and gravel. An outstanding feature of this soil type is the amount of rounded gravel and stony material present. A varying amount is contained in the upper soil layers, but the subsoil and substratum consists largely of unweathered, more or less stratified sands and gravel. The gravel, mostly well rounded and water-worn, consists principally of gray and brownish-gray sandstone and shale fragments, together with small quantities of granite, other crystalline rocks, and some limestone. Limestone in few places occurs on the surface or in the upper layers, but in many places it is abundant at a depth ranging from 5 to more than 8 feet. Lime incrustations cover the gravel in many places, and masses of gravel may be cemented together by carbonate of lime. The leached upper soil layers, however, invariably are acid in reaction.

Drainage waters are readily absorbed, owing to the open and porous soil material. The soil dries quickly, and the water-holding capacity is so low that the land is usually too droughty for normal plant growth.

Owing to its irregular surface, land of this type is utilized largely for such pasture as it affords. Pasture grasses are sparse and include many undesirable and unpalatable species. Some grass is grown for hay on some of the smoother areas, but yields are low. Rye is sometimes grown. Selected small fields or patches are used for vegetables or for orchards. As a whole this kind of land is inferior for farming. Some ridges have been opened for obtaining sand and gravel for use in building or for road construction.

**Copake loam.**—Copake loam occurs only in a few narrow strips on the south side of the Mohawk River above Schenectady. The total area is small.

The surface soil is grayish-brown friable loam or silt loam, and in places it is slightly sandy. Between depths of about 8 and 16 inches is light-brown or bright-brown compact but moderately friable loam or silt loam. This passes into light-brown compact but easily crushed loamy or fine sandy material, which grades into generally looser gravelly and sandy materials. Little or no gravelly or cobbly materials are present in the surface soil. To a depth of at least 36

inches the reaction is acid. At depths of about 5 feet the reaction generally is alkaline.

The surface is smooth or, in places, slightly undulating, and drainage is good.

Practically all of the land is cleared, and about 90 percent is put to some agricultural use. It is used in about the same way and for about the same crops as Copake cobbly loam, but is somewhat easier to cultivate.

**Copake very fine sandy loam.**—Copake very fine sandy loam occurs mainly in the northeastern part of Albany County. The total area is small. This soil has much the same general character as the related fine sandy loam, but the finer soil texture favors retention of moisture and fertilizer and generally enhances the soil's productiveness.

The 9- or 10-inch surface soil is dull grayish-brown friable very fine or fine sandy loam. This grades into brownish-yellow or light-brown firmly bedded but friable fine sandy loam or loamy fine sand, which, at a depth of 26 to 28 inches, passes into brownish-gray slightly loamy gritty coarse sand, fine gravel, and small finely divided shale chips, with some coarser fragments. In places this subsoil layer contains much coarser gravelly materials, which continue to a depth of many feet. The surface soil is mostly gravel free, but some granite and quartzite gravel and cobbles are present in places. The upper soil layers are prevailingly acid, but the subsoil below a depth of 30 inches is generally alkaline.

The surface is smooth, nearly level, or gently sloping. Good drainage prevails.

Probably 90 percent of the land is improved tillable land, and all appears desirable and productive. Corn, small grains, and grass are thrifty. Kentucky bluegrass, timothy, and clover produce a good sod. Special crops, such as cabbage, beans, asparagus, flowers, and orchard fruits, are grown.

**Copake cobbly loam.**—A few narrow bands of Copake cobbly loam lie along the Mohawk River above Schenectady. Only a small total area is mapped.

The 8- to 10-inch surface soil is grayish-brown mellow loam or gritty silt loam intermixed with enough rounded cobbles and gravel to impede cultivation. It is underlain by yellow or brownish-yellow firm friable gritty loam, which passes at a depth of 18 to 20 inches into loose yellowish-brown loam or sandy loam. At a depth ranging from 32 to 48 inches, this material grades into brownish-gray gritty compact loam. The substratum, lying at a depth of 4 feet or more in most places, consists of beds of stratified gravel and sand, more or less coated with carbonates. Particles of gravel, as well as cobbly material, of gray and brown sandstone and shale, and some quartzite and granite, are scattered through the soil. The soil is acid to a depth of 3 feet or more in most places.

Drainage is well established, and, with the exception of some minor unevenness, the land is level and easily tilled.

Most of this soil is cleared, and probably 80 percent of the cleared land is used for cultivated crops. Corn grows well, and alfalfa produces good stands. Clover and timothy, as well as vegetables and miscellaneous crops, also thrive.

**Copake fine sandy loam.**—Copake fine sandy loam occurs only in the Hudson Valley. The larger areas are on the bench between Newtonville and Albany, and they extend southward between Glenmont and Cedar Hill. A number of detached areas lie along Normans Kill, and two bodies are south of Pinebush School.

The surface soil is dark dull grayish-brown friable fine sandy loam about 10 or 12 inches thick. This grades into brownish-yellow or dull-yellow moderately friable and firmly bedded fine sandy loam or loamy fine sand; and this, in turn, passes at a depth ranging from 20 to 30 inches into brown or yellowish-brown compact and, in many places, somewhat crusty loamy fine sand, more or less stained or faintly mottled with darker brown. In most places the substratum, which lies at a depth ranging from 4 to 8 feet, is stratified shale and sandstone gravel with some other rocks and coarse sand, generally coated with varying amounts of calcium carbonate. The upper sandy layers are acid in reaction and in general contain little or no gravel. Some of the surface soil, about 1 mile south of Guilderland and in other places, contains enough gravel to modify somewhat the tillage properties. Some exposed locations have been slightly eroded by the wind.

The surface is generally level with some unevenness here and there. Internal drainage is thorough.

Probably more than 75 percent of the total area of this soil has been cleared and cultivated at some time, although probably not more than 40 or 50 percent now is regularly cultivated.

The land is used for general dairy subsistence crops with considerable areas devoted to special crops, such as sweet corn, tomatoes, cabbage, cauliflower, beans, and other vegetables. Well-cared-for land supports fair stands of timothy, bluegrass, and other pasture grasses. Wild mustard is a troublesome weed in places. Timbered areas support a stand of mixed hardwoods.

**Copake cobbly sandy loam.**—Copake cobbly sandy loam is mapped in ridgelike positions only in the vicinity of Schenectady, in one or two areas farther up the Mohawk River, and north of Albany. The total area is small.

The surface soil consists of brown or grayish-brown cobbly sandy loam with inclusions of areas having a cobbly loam texture. The topmost inch or two in wooded areas is somewhat darkened by organic matter. Between depths of about 6 and 18 inches is light-brown or brownish-yellow somewhat coherent cobbly gritty loam. Beneath this is yellow gritty loose cobbly loam, which grades at a depth of 40 to 50 inches into layers of stratified coarse brownish-gray sands, rounded gravel, and cobbles, many of which are coated with lime below a depth ranging from 5 to 15 feet. The reaction to depths of 3 or 4 feet generally is acid. Rounded cobbles, gravel, and pebbles are abundant on the surface and throughout the soil mass. These stone fragments are as much as 8 inches in diameter. They consist chiefly of gray and brownish-gray sandstone fragments but include some limestone, granite, gneiss, and crystalline rocks. Copake cobbly sandy loam differs from Chenango gravelly silt loam principally in having lime material closer to the surface and including a great variety of rocks other than sandstone and shale typically contained in the Chenango soils.

The porous materials provide thorough natural drainage.

Little use of the land is made for farming purposes. At least 90 percent or more is idle or pasture land. Some use is made of the material in the lower layers for road gravel. The natural vegetation is a thin growth of trees and underbrush. Cleared areas are covered with a sparse growth of grasses and weeds common to the region, which furnish meager pasturage. Only a few small scattered fields are used for cropping, and yields are below the general average.

**Colonie gravelly sandy loam.**—Colonie gravelly sandy loam occurs in a few scattered areas in northern and eastern Schenectady County.

The surface soil generally is dark-brown or dark grayish-brown sandy loam containing various-sized particles of rounded crystalline gravel. Beneath a depth of about 8 inches is brownish-yellow loamy sand, somewhat compactly bedded in the upper part. This grades at a depth of 18 to 20 inches into yellow slightly loamy fine sand or yellow slightly loamy sand, several feet thick. In many places, thin slightly crusty layers occur at a depth ranging from 35 to 40 inches. The entire soil mass contains gravel. The reaction is acid to a depth of several feet.

The surface is level to undulating or is marked by narrow ridges. Surface and internal drainage are good. Some areas are excessively drained.

Much of the land has been cultivated, but at present not over 10 to 15 percent is in regular use, as the productivity is low unless the soil is carefully managed and fertilized. Some of it produces good yields of truck crops, apples, and pears and, in places, affords fair pasture.

**Hoosic loamy coarse sand.**—The 8- or 9-inch surface soil of Hoosic loamy coarse sand normally consists of fairly dark grayish-brown or dark-brown loamy coarse sand. Under forest cover the topmost inch or two is noticeably darker. The surface soil is underlain by brownish-yellow slightly coherent loamy coarse sand containing fine gravel. This material grades at a depth of 24 or 25 inches into yellow loose incoherent coarse sand and fine gravel, which below a depth of about 4 feet consists of somewhat finer sandy material, generally showing cross bedding and stratification, with colors ranging through brown, yellow, and gray. For the most part the soil is free of boulders and cobbles, although there are a few small granite or quartzite boulders in some places.

The upper layers are invariably acid in reaction, but the substratum in places is neutral at a depth ranging from 5 to 6 feet.

Water drains away quickly, and often the soil is excessively drained. Although the moisture-holding capacity is limited, a few farmers find the soil much less droughty when the land is plowed in the fall.

Hoosic loamy coarse sand is mapped only in Schenectady County, north of Schenectady to East Glenville and west and northwest of that city. The total area is fairly large.

The surface is generally nearly level, with little relief. Most of the land lies from 300 to 350 feet above sea level.

A considerable acreage is covered with a growth of scrubby pine, oak, maple, and poplar, with a rather sparse stand of poverty oatgrass, broomsedge, and redtop. Blow spots—places where the wind

has displaced some of the soil—are noticeable features over much of the uncultivated areas.

Extensive areas are idle, and many formerly cleared sections are reverting to forest. Other areas are used for pasture, although the grass is sparse and of poor quality. Approximately 10 to 15 percent of the land has been brought into some form of cultivation. General farm crops, such as corn, oats, potatoes, buckwheat, timothy, clover, and alfalfa, are grown on some selected fields. Truck crops are grown to some extent in the vicinity of Schenectady. Yields are generally low and uncertain, and unless the land is carefully fertilized they fall below the average for the region. A few people grow flowers, such as gladiolus, commercially; others raise poultry or grow fruit.

Some of the land has been utilized as building sites. The extent of idle or unused land indicates the uncertainty of adequate crop returns.

**Colonie loamy fine sand.**—Areas of this soil are fairly well distributed through the Hudson Valley. The total area is large.

The 6- or 7-inch surface soil is composed of grayish-brown or brown friable loamy fine sand. This grades more or less abruptly into light-brown or brownish-yellow somewhat firm loamy fine sand, stained or faintly mottled, in many places, with rusty brown and gray. Below a depth of 12 to 16 inches is slightly loamy less compact light grayish-brown fine sand, which grades at a depth of 24 to 30 inches into slightly coherent fine sand, in many places containing some stains of brown and gray. The lower part of the subsoil generally consists of stratified grayish-brown fine sand. Within ordinarily observed depths the reaction is medium to strongly acid.

In Albany County the prevailing texture of the surface soil is loamy fine sand as indicated above, but some of this soil as mapped in Schenectady County is loamy sand.

The generally smooth surface is varied in places by rounded low ridges and mounds evidently shaped by the wind. Fresh sand dunes are still forming. Drainage is thorough, and the soil is rather droughty.

Probably 80 percent of this soil is out of cultivation and used for what pasturage it affords, or it is kept in timber comprising several kinds of hardwoods and white pine. Cultivated areas are devoted largely to special crops, such as vegetables and other early-maturing crops. Sweet corn, melons, squash, tomatoes, cabbage, cauliflower, and asparagus are grown with more or less success.

**Granby loamy fine sand.**—Small bodies and strips of Granby loamy fine sand are associated with areas of the Wauseon and Claverack soils throughout the sandier parts of the Hudson Basin. Representative areas are northwest of Wemple, northwest of Albany, and south of Schenectady.

Typically, the surface soil is dark-brown or very dark gray loamy fine sand, through which almost white quartz sand grains are scattered in many places. Between depths of about 10 and 16 inches, in marked contrast in color to the surface layer, is a layer of light-gray or ash-colored firmly bedded loamy fine sand, thinly streaked with fine spots of brown or rusty brown. Beneath this is dull- or pale-yellow moderately compact, in places crusty, loamy fine sand streaked irregularly with light-gray and rusty-yellow variations. Aggregations or pockets of silty and loamy material or of sandy clay occur

in places. Between depths of about 30 and 50 inches is moist brownish-gray loamy fine sand mottled faintly with gray and brown. The surface layer generally is slightly acid, the layers beneath it are prevailingly neutral or alkaline, and the lower part of the subsoil in many places contains enough lime to effervesce with dilute hydrochloric acid.

Areas occupied by this soil are level or slightly depressed below areas of adjacent soils. In places a few higher lying areas are included, in some of which the soil approximates Claverack fine sandy loam, deep phase, or other better drained sandy soils. Drainage is poor. In wet seasons water usually saturates the whole solum, and in drier seasons the water table may stand 24 inches below the surface.

A large part of the land is unimproved and supports a timber growth of maple, elm, water oak, pine, poplar, reedy grasses, poverty oatgrass, and brushy plants. Perhaps 10 percent is cleared, drained, and used for some of the general crops and for vegetables. When it is ditched so that water drains from the surface and the water table is lowered, the soil has good productive capacity for corn and a variety of truck crops.

**Hudson silty clay loam.**—A belt of Hudson silty clay loam about 1 mile wide extends from the vicinity of Ravena northwesterly along the West Shore Route of the New York Central system to the vicinity of New Scotland, thence, including more detached areas, to a point north of Schenectady. A well-defined area occurs on the bench west of Cohoes. Bodies are scattered elsewhere throughout the Hudson Valley. The soil is fairly extensive.

The surface layer is dull-brown friable rather granular light silty clay loam. At a depth of 6 to 8 inches the material is dull grayish-brown moderately friable granular silty clay loam becoming more yellowish brown below a depth of 14 to 16 inches. In the next few inches the material becomes less friable and contains an increasing number of mottles of yellow, brownish yellow, and rust. The subsoil below a depth of about 20 inches is normally light reddish-brown compact silty clay that is more or less mottled with brown, grayish brown, or gray and is smooth and somewhat plastic when wet. Most fresh cuts reveal the lower part of the subsoil as composed of alternately bedded silts and clays variously colored with yellowish brown, ruddy brown, and yellow. The upper soil layers range from slightly acid to neutral in reaction; whereas the heavier subsoil is prevailingly alkaline, and the substratum below a depth of 4 to 5 feet contains enough lime to effervesce with acid.

In places, especially adjacent to sandy soils, the surface soil is somewhat modified by enough fine sand and very fine sand to make the texture more or less loamy. The comparatively heavy surface soil and subsoil in the larger bodies in pastures and untilled fields tend to contract and form cracks on drying.

The surface is nearly level or slightly undulating. Fairly good drainage conditions prevail.

Probably over 90 percent of this soil is cleared and used for farming. Forest trees include elm, red oak, hard maple, hickory, and some white pine.

This land produces good hay and pasture but is less desirable, in many of the flatter areas, for the production of corn and potatoes

than some of the more loamy soils with more variable relief. Owing to the nearly level surface and the heavy-textured subsoil, some of the land does not dry out quickly in the spring.

Dairy farming is the most important agricultural enterprise, followed by trucking. Apples and other fruits are grown, but neither extensively nor commercially. Under good management this soil returns good yields of the general farm crops. Mixed timothy and clover yields from 1 to more than 2 tons of hay an acre, corn 10 to 12 tons of silage and 25 to 40 bushels of grain, oats 30 to 50 bushels, alfalfa 2 to 3 tons of hay, and potatoes 100 to 125 or more bushels. Most of the pastures are well maintained and contain much bluegrass, bentgrass, and white clover. Quackgrass is a pest in some localities. Much stable manure is used for improving the productivity of the soil.

**Hudson clay.**—Hudson clay occupies a narrow belt not over one-fourth mile wide at the base of the bluff extending southward from Maplewood west of Watervliet into the northern city limits of Albany. The total area is small.

The 5- to 6-inch surface layer is composed of grayish-brown moderately friable granular clay or silty clay. It is underlain by brownish-gray compact clay stained and faintly mottled with yellow, gray, and brown. At a depth of 12 to 15 inches is heavy compact brown or grayish-brown clay variously mottled with brown, gray, and yellow, which is somewhat lighter colored and more compact in the lower part. The surface soil is neutral or slightly alkaline in reaction, and the subsoil is invariably alkaline. The surface is generally smooth and slightly sloping. Fair surface drainage prevails.

Owing to the heavy texture of the soil, the difficulty of properly cultivating it, and its coldness, it can be used for only a few kinds of crops. It is a good soil for grass, and some of it is used for this purpose. Bluegrass, bentgrass, timothy, white clover, and alsike clover grow well on it. Some use is made of it for certain truck crops.

**Hudson silt loam.**—Hudson silt loam is mapped only in the Hudson Valley. It is associated with other Hudson soils and Claverack fine sandy loam. The principal areas are near the southern limits of the city of Albany between Slingerlands and New Scotland, south of Schenectady toward Dunnsville, and 1½ miles southeast of East Glenville. The total area is not large.

In general, the surface soil consists of light-brown or light grayish-brown friable silt loam, containing some fine sand in places. Between depths of 7 and 15 inches is grayish-brown moderately compact or firm silt loam, with staining and mottling of gray, rusty brown, and yellow. This material is underlain by very compact silty clay, mottled yellow, brown, and light gray. Below a depth of 30 inches are plainly laminated silt and clay materials. The clay is dull brown with intervening layers of brownish-yellow silt and, in some places, very fine sand. The layers are marked with variable mottles of brown, yellow, and gray. More or less stratified clay and sandy materials form the substrata to a depth of many feet. The upper layers are acid, but the subsoil, beginning at a depth of 24 to 30 inches, is alkaline.

The surface is generally level to slightly undulating or, in places, gently sloping toward drainageways. Good surface drainage prevails, but internal percolation of water is slow.

Probably 85 to 90 percent of the soil is cleared and has at some time been cultivated. Perhaps not more than 25 to 30 percent is now regularly cultivated, and the rest is given over to pasture or idle land. Some of the land is used for building sites.

Many of the general farm crops are successfully grown, but a considerable acreage is used for special or truck crops and small fruits, such as sweet corn, cabbage, cucumbers, snap beans, tomatoes, and raspberries. Apple trees grow well. Much of the pasture and old mowing land has a poor grass cover and a weedy growth of goldenrod, ragweed, devil's-paintbrush, and wild strawberry.

**Claverack fine sandy loam.**—Areas of Claverack fine sandy loam are associated with areas of Hudson silty clay loam, and Claverack fine sandy loam, deep phase, in the eastern part of the Hudson Valley. Those situated around the southwesterly limits of Albany and about 2 miles southwest of Bethlehem Center are representative.

This soil is characterized by a 20- to 40-inch sandy layer overlying lacustrine clays. The thickness of the sandy layer varies in some areas within short distances. In most areas the soil has a plow-depth layer of brown or dull-brown mellow fine sandy loam. This rests on yellowish-brown firm friable fine sandy loam, the color of which fades to brownish yellow at a depth of 14 or 16 inches. This material grades into more compactly bedded yellowish-gray fine sandy loam with streaks of darker infiltrations and mottles of brown or rusty yellow and gray. At a depth of about 22 to 24 inches is bright-brown compact silty clay containing varying darker streaks. This material continues downward with somewhat paler brown colors, and at a depth of 5 to 6 feet it is bluish gray in many places. The clays generally are laminated and in places are interbedded with silty or very fine sandy materials. The upper sandy soil material is everywhere acid in reaction, whereas the clay is alkaline and in many places contains enough free lime to effervesce with acid.

As a rule, the sandy mantle over the clays is shallower where the soil adjoins Hudson silty clay loam than it is where the soil adjoins Claverack fine sandy loam, deep phase, and the Colonie soils. The area about 2 miles southwest of Wemple has a much finer sandy covering, mainly a very fine sandy loam.

The surface is level to slightly undulating, so that run-off is slow. The mottled condition above the clay beds indicates that the clay subsoil prevents rapid downward movement of water.

Probably 85 percent of this land is cleared and is used successfully for the production of the standard crops of corn, oats, rye, timothy, and clover for hay, and, in many localities, a variety of vegetable crops. In seasons of moderately well distributed rainfall, yields are generally excellent, and even in the drier seasons the soil maintains a good supply of water. Farming methods usually are efficient as to fertilization and general cultural practices. Dairy farms appear prosperous, and much manure is applied to the land in addition to the fertilizers used. For vegetable crops the land receives liberal fertilization. Most of the areas are conveniently located for the growing and marketing of these special products.

**Claverack fine sandy loam, deep phase.**—The deep phase of Claverack fine sandy loam occurs in numerous irregular-shaped rather small areas associated with the typical soil, the Hudson soils, and, to some extent, the Colonie soils. It differs from typical Claverack fine sandy loam in having a deeper stratum of sandy materials over the clay substratum. It is distributed from southeastern Schenectady County down the eastern part of the Hudson Valley nearly to Ravena. This soil is fairly extensive.

The surface soil is composed for the most part of brown or dark grayish-brown friable light fine sandy loam or loamy fine sand. Below plow depth is brownish-yellow or yellowish-brown loamy fine sand. At a depth of 16 to 18 inches the material grades downward into somewhat compact, in many places somewhat cemented, loamy fine sand more or less mottled brown, rusty brown, and gray, with flecks of black. This grades at a depth of 3 to 4 feet or more through slightly compact brownish-gray loamy fine sand faintly mottled with various shades of brown, rusty yellow, and gray to the substratum, which in most places consists of brown or gray lacustrine clays. The upper layers are acid in reaction, but the somewhat compact subsoil generally is alkaline. The areas of this soil in Schenectady County generally are somewhat coarser textured and include some sandy loam, whereas those in Albany County are predominantly fine sandy loam as described.

A deeper and somewhat better drained variation of this soil, particularly the area along Normans Kill 3 to 4 miles east of Voorheesville, consists of grayish-brown or yellowish-brown mellow loamy fine sand or loose fine sandy loam, which at a depth of 8 or 9 inches grades into firmly bedded brownish-yellow loamy fine sand. At a depth of 16 to 18 inches this gives way to yellowish-gray less coherent loamy fine sand, which at a depth of 30 inches or more is generally stained or lightly mottled with rusty yellow, brown, and gray.

The surface of this soil is nearly level, but in places it ranges from undulating to somewhat ridgy or sloping, or includes low knolls. The more sloping areas of this soil are similar to soils of the Colonie series. Drainage in the upper layers is generally adequate but is somewhat sluggish in the subsoil. Many small depressions where included soils resemble Granby and Wauseon soils are more poorly drained. Soil moisture is fairly well maintained in dry seasons.

Forests include elm, maple, white birch, oak, white pine, and quaking aspen (poplar) trees, with an undergrowth of briers, vines, coarse grasses, and ferns.

Perhaps from 30 to 40 percent of the soil is cleared for farming. Some of the areas in Albany County return fairly satisfactory yields of general farm crops, such as corn, oats, rye, millet, and timothy and clover. Kentucky bluegrass and Canada bluegrass, among others, thrive well in many pastures. In Schenectady County and the northern part of Albany County this soil is used largely for truck and special crops in small fields. With liberal fertilization satisfactory yields of sweet corn, peas, tomatoes, cabbage, beans, strawberries, and sometimes raspberries are obtained. Apple trees grow well in some places.

**Wauseon fine sandy loam.**—Small areas of Wauseon fine sandy loam are distributed throughout the Hudson Valley in association

with the Hudson and Claverack soils. Representative areas are about 1 mile southwest of Delmar and about 1 mile southeast of East Glenville. Only a small total area is mapped.

The surface soil generally is dark-brown friable fine sandy loam or in places loamy fine sand, and its loaminess is enhanced by the liberal content of organic matter. This grades at a depth of about 8 inches into somewhat darker brown not quite so friable fine sandy loam with a considerable organic-matter content. At a depth of 14 or 15 inches this material passes abruptly into bright-brown dense plastic clay mottled dark bluish gray and rusty brown, with darker streaks of infiltrated organic matter. This, in turn, grades imperceptibly at a depth of 24 to 30 inches into somewhat grayish brown dense laminated or platy clay mottled with bluish gray, brownish yellow, and black. The upper sandy layers are slightly acid to neutral in reaction and the clay subsoil is more or less alkaline.

The surface configuration and drainage conditions cover about the same range as in areas of Granby loamy fine sand, although the heavy subsoil of Wauseon fine sandy loam has slower internal drainage. Water stands for several days at a time on many areas during wet seasons.

Probably 75 percent of the soil is unimproved and timbered, and the rest is used largely for pasture. Occasional patches are cultivated in connection with adjoining soils. Such pasture plants as bentgrass and white clover provide fair pasturage on cleared areas.

**Orono silt loam.**—Orono silt loam occurs in a few scattered level or slightly depressed imperfectly drained areas in association with Hudson silt loam.

The surface layer consists of dark grayish-brown moderately friable granular silt loam, passing at a depth of about 6 inches into dark-gray slightly compact silt loam or silty clay loam. At a depth of 14 or 15 inches is compact brownish-yellow silty clay mottled with rusty yellow, yellow, dark brown, and gray. Below a depth of 28 to 30 inches is compact bluish-gray silty clay coarsely mottled with yellow, brownish yellow, and gray. In many places the subsoil shows some stratification with slight sandy variations. The surface layers crack on drying. The soil in all layers is generally alkaline, and the subsoil in many places effervesces sufficiently with dilute hydrochloric acid to indicate the presence of calcium carbonate.

The soil in two or three small included areas, southwest of Delmar, has a dark grayish-brown compact fine sandy loam surface layer underlain by lighter gray compact fine sandy loam that is stained and mottled with gray, rusty brown, and yellow at a depth of 12 or 14 inches. This material rests at a depth of 16 to 20 inches on brownish-yellow sandy clay or silty clay variously mottled with gray, brown, and rust.

Owing to its imperfect drainage, Orono silt loam has limited uses. Probably three-fourths of it is cleared and used for pasture or hay land, and selected areas are sometimes used for grain and truck crops. Pastures contain good stands of white clover, red clover, bentgrass, and bluegrass.

**Orono silty clay loam.**—Orono silty clay loam is mapped only in the vicinity of Meadowdale. The total area is small. This soil lies at a slightly higher level and is somewhat better drained than the adjoining areas of Livingston silt loam.

The 8- to 10-inch surface soil is dark grayish-brown silty clay loam or clay loam that is moderately friable and pulverizes readily under optimum moisture conditions. It is underlain by dark bluish-gray dense silty clay, which passes at a depth of 16 to 18 inches into mottled dark-gray, rusty-brown, and yellow dense compact rather plastic clay. Below a depth of about 30 inches is dull bluish-gray dense silty clay mottled rusty brown and yellow. In places the lower part of the subsoil contains various quantities of gravel. The surface soil generally has an acid reaction, but the subsoil layers are alkaline.

The smooth even surface makes the land readily tillable, and practically all of it is cultivated. Fair to good results are obtained with general farm crops. Clovers make good stands, and in one location alfalfa seems to thrive well.

**Livingston silty clay loam.**—Narrow strips and small bodies of Livingston silty clay loam are distributed throughout the eastern lowlands. The elevation is somewhat lower than that of most adjacent soils, the surface has a very slight gradient, run-off is sluggish, and drainage is poor.

In general, the surface soil consists of dark grayish-brown or nearly black finely granular mellow silty clay loam. At a depth of 9 or 10 inches is dense black silty clay containing some rusty brown or yellow thin streaks along fracture joints. Below a depth of about 20 inches the compact silty clay is broadly streaked or mottled with bluish black, yellow, and rusty yellow. Below a depth of 30 inches the material in many places is more gritty but plastic, moist, or saturated, consisting of gritty clay mottled dark blue and rusty brown. A few quartzite pebbles occur throughout the soil in some areas. In many places the surface soil has an acid reaction, but in others it is alkaline; the subsoil layers are almost invariably alkaline.

Probably less than 20 percent of the land is cultivated. Most of it supports various hardwood trees or, where cleared, is used for pasture. Some of the soil is used for such crops as corn, oats, and buckwheat. In drier seasons corn, as well as the small-grain crops, grows satisfactorily. Small grains, however, tend to develop a too rank growth of straw and are likely to lodge before harvest time.

**Livingston silt loam.**—Livingston silt loam is associated with Livingston and Orono silty clay loams.

This soil resembles Livingston silty clay loam in most respects, but differs from it in that it has a friable silt loam surface soil and a heavy friable silt loam upper subsoil layer, which overlies a less plastic and dense lower subsoil layer. In some places fine to very fine sandy loam surface soils are included on the map, especially where distinctly sandy soils lie adjacent.

The lighter texture and somewhat better drainage makes this soil a little better suited to crop production than Livingston silty clay loam. The supply of organic matter is ample, and in reasonably dry seasons good results can be obtained with crops. Some truck crops are grown in selected locations.

**Hudson silt loam, broken phase.**—Hudson silt loam, broken phase, is associated with typical Hudson silt loam and occurs in narrow strips along the slopes leading to the stream courses, which have cut deep channels back into the terrace plains, and along other terrace edges. The slopes are steep enough to preclude their profitable culti-

vation and to induce severe erosion on exposed surfaces. Much of the surface soil is silty clay loam, and the brown heavy clays appear at the surface in many places. The less steep areas furnish good pasture of bluegrass, bentgrass, and some clovers. Some of the steeper slopes are covered by timber.

Hudson silt loam, broken phase, includes steeply sloping soils similar to Claverack fine sandy loam and Hudson silt loam. They occupy the steep broken edges of areas of those soils. These inclusions range from fairly deep layers of fine sandy material over brown lacustrine clay to exposures of these clays on the surface. Much of this land supports a mixed timber growth, and cleared areas are used for pasture, dominantly of bluegrass. Owing to the generally steep slopes and the tendency of the soil to erode, this land has little agricultural value other than for pasture.

**Colonie loamy fine sand, broken phase.**—Areas of Colonie loamy fine sand, broken phase, include a sandy soil with a profile like that of typical Colonie loamy fine sand. They are so rolling or steeply sloping as to make them entirely unsuitable for cultivation under present economic conditions. Much of this land appears to have acquired its irregular features through wind action in the remote past, and new dunes are forming on a few cleared spots.

Most of this soil is in the sandy section of northern Albany County. Most of it supports a scrubby growth of oak and pitch pine, together with an undergrowth of broomsedge, sweetfern, and various shrubs. At times fires sweep over some of these areas. Owing to its unfavorable topography and its looseness, this soil has almost no agricultural value. Its best use is for what timber it can produce and for recreational purposes.

**Colonie fine sand, rolling phase.**—Rolling or dunelike Colonie sandy soils associated with the other Colonie soils are separated as Colonie fine sand, rolling phase. In many places the sand is barren and shifts more or less in the wind. Where the surface has been protected by timber or other vegetation for many years, a rudimentary soil profile has developed. A representative profile under a vegetative cover has a 4-inch surface layer of dark-brown slightly loamy fine sand which is underlain by slightly loamy yellowish-brown fine sand. This grades into yellow fine sand or medium incoherent sand, which, at a depth of 3 to 4 feet, in many places is somewhat compactly bedded. In most places the material to a depth of at least 4 feet is decidedly acid, but here and there the material at this depth shows a neutral or slightly alkaline reaction. Like the broken phase of Colonie loamy fine sand, this land has little agricultural value. Selected areas are sometimes utilized for special crops such as asparagus, root vegetables, or grapevines, but most of the soil should be kept in such timber growth as can be maintained on it.

### SOILS DEVELOPED FROM GLACIAL DEPOSITS OF THE APPALACHIAN PLATEAUS AND VALLEYS

The productive capacities of soils of the Appalachian Plateaus vary considerably with depth of the soil materials, kinds of parent rocks, condition of drainage, degree of stoniness, and, to some extent, elevation and surface configuration of the land. These soils may be classed as well drained, imperfectly drained, and poorly drained.

The Pittsfield, Wooster, and Poland soils are deep and well drained. The Pittsfield soils have good productive capacity and give excellent results with a wide variety of farm crops with a minimum of fertilization. Their parent materials for the most part are alkaline and have a high lime content. Good pastures of bluegrass, bentgrass, and clovers are easily maintained. Generally prosperous farming conditions prevail on these soils. The Wooster soils have less favorable relief than the Pittsfield soils. Since they are developed largely from acid sandstone and shale materials, they are acid in reaction. These soils respond readily to good management and fertilization. The Poland soils are dark and are derived from glacial till composed largely of dark shales and limestone. They are alkaline in the subsoil, well drained, and productive for a wide range of farm crops. Bedrock lies nearer the surface than it does in the Pittsfield and Wooster soils.

Soils of the Farmington, Lordstown, Angola, and Lackawanna series are shallow and well drained. The Farmington soils are shallow over limestone rock and have much of this material in their make-up. The presence of limy materials favors the growth of grasses and legumes. The Angola soils are shallow and are developed from calcareous clay shales. They are only moderately well drained. Both the Lordstown and Lackawanna soils are developed from very shallow glacial till over acid sandstone and shale rocks. The former is developed from gray materials and the latter from brown and reddish-brown materials. Both are fairly productive where the soils are deep enough and not too stony or too steep. The general productivity, however, is low, and farming conditions are decadent.

The imperfectly drained soils developed from glacial sandstone and shale till generally have friable surface soils and compact mottled subsoils. The better drained and more promising members of the group are the Langford and Canfield soils. Both have friable surface soils and compact mottled subsoils. They differ in that the Langford soil normally is slightly acid to alkaline in the subsoil, whereas the Canfield is medium to strongly acid in the subsoil. Less well drained associated soils, which are mottled just below plow depth and in which compact subsoils occur at slight depths, belong to the Erie and Volusia series. The subsoils of the Erie soils are slightly acid to alkaline, and those of the Volusia are medium to strongly acid in reaction. Both soils are fairly good for grass and pasture but are inferior for most cultivated crops. The Culvers soils, formed from the same kind of parent materials as are the Lackawanna soils, have somewhat the same profile characteristics and agricultural value as the Canfield soils. The Schoharie soils are developed from lacustrine materials. They are characterized by light-red or pink calcareous plastic clay subsoils. In places they are somewhat difficult to work but are good soils for grass and are used successfully in dairy farming.

Poorly drained soils include the Chippewa, Norwich, Lyons, and Allis soils. The Chippewa and Norwich soils are wet for considerable periods in the year. The Chippewa soils are associated with the Canfield, Volusia, and Lordstown soils and to some extent with the Erie soils. The surface soil is dark, the subsoil is compact, and the poor drainage renders the soil unimportant agriculturally. The Norwich soil has the same general features, but the parent materials are derived from the reddish-brown sandstone and shales. The Lyons

soils are very dark colored, approximately neutral in reaction, and poorly drained. The shallow poorly drained Allis soils are developed largely through the weathering of acid shales, although glacial deposits have contributed a little material. They are little used except for pasture or for timber.

Areas that are too steep and uneven to have little use other than for pasture or forestry are separated as broken or steep phases of the various upland soils.

#### DEEP WELL-DRAINED SOILS

**Pittsfield silt loam.**—The largest body of Pittsfield silt loam is a rectangular body of about 10 square miles, a short distance north of Berne and West Berne. A few small isolated bodies are associated with bodies of the Farmington soils elsewhere in Albany County.

The surface soil to a depth of about 7 inches is medium dark-brown or grayish-brown mellow friable silt loam. In timbered areas, the mantle of the forest debris, which is about 1 inch thick, has somewhat darkened the topmost 2 inches of soil. Beneath the surface layer is light brownish-gray granular mellow slightly gritty silt loam. Between depths of about 12 and 18 inches the material is brownish-gray heavy silt loam or silty clay loam that, in places, contains thin seams of grayish-brown and rust-brown colorations. Beneath this, and extending to a depth of about 32 inches, is brownish-gray or grayish-brown heavy somewhat compact, in many places slightly friable, clay loam or silty clay loam. Grayish-brown and faint rusty brown stains vary the color in many places. This material is underlain by grayish-brown slightly compact heavy silt loam or silty clay loam. The upper soil layers generally are slightly or medium acid; the intermediate layers are slightly acid; the lower layers, beginning at a depth of 18 to 20 inches, are about neutral; and the material below a depth of about 24 inches is distinctly alkaline.

Throughout the several layers are varying quantities of partly weathered limestone fragments, dark-colored shales, gray- and iron-stained sandstones, and some crystalline rocks, the weathered residue of which has influenced the soil texture and structure. The abundant shale content has evidently contributed to the heavier textures and compaction of some of the soil, whereas the limestone fragments contribute to a more friable and mellow consistence.

The surface ranges from nearly level to rolling. Surface drainage is adequate, and internal drainage is fair, with some sluggishness where the subsoils are heavier than normal. The water-holding capacity is such that crops ordinarily are well supplied with moisture during the growing season.

Probably 95 percent of the soil is improved and utilized more or less intensively for farm crops. Small farm wood lots are on most farms.

Because the soil is strongly influenced by limestone constituents in its composition, Pittsfield silt loam is considered one of the most desirable general farming soils of the area. Dairying and general farming prevail. Many farms are composed almost entirely of this soil. Corn, oats, buckwheat, hay, and alfalfa return yields well

above the average for the general region. This is considered a desirable soil for alfalfa, which is established on a large number of farms. Usually two, sometimes three, cuttings of this crop are made in a season. Corn for grain yields from 50 to as much as 80 bushels or more under good management, and silage corn yields 10 to 14 tons an acre.

Farm practices on this soil generally are efficient and well carried out. Dairy livestock is well managed, and a high production of milk per cow is the rule. Generally prosperous conditions prevail, and there is little or no abandoned or idle land.

**Wooster silt loam.**—Small areas of Wooster silt loam are scattered over southwestern Albany County.

The surface soil consists of dull grayish-brown or dark yellowish-brown friable silt loam. Below a depth of about 8 inches in most places is light-brown or somewhat yellowish brown friable silt loam. This grades below a depth of about 10 inches into yellowish-brown moderately compact but friable granular silt loam. At a depth of about 30 inches is brownish-gray granular or somewhat gritty moderately friable silt loam or silty loam that is several inches thick and grades into brownish-gray less-weathered gritty gravelly loam composed largely of sandstone and shale fragments.

Here and there the subsoil is more compact than that just described and approaches the compact subsoil of Canfield silt loam. In some small spots bedrock lies close to the surface and the soil resembles Lordstown silt loam. Varying quantities of sandstone and shale fragments in the upper layers in general do not greatly modify the soil structure.

About 9 square miles of this soil are mapped. The rock materials composing the soil mass are largely from sandstone and shale, with minor igneous rock components. All the soil material in the observed profile is acid in reaction. Drainage is well established. Most of the areas have a smooth gently rolling or sloping surface, and in many instances they occupy valley slopes. Somewhat over half of the areas may be rated as improved land.

Owing to the comparatively small size of bodies of Wooster silt loam, this soil composes but a small part of most farms where it occurs. The soil is handled in about the same way as are other adjoining soils, and it produces good average yields of subsistence crops. It is a good soil for potatoes and if limed should support satisfactory stands of alfalfa.

**Poland silt loam.**—Although the total area is small, Poland silt loam is recognized as a desirable and productive soil. Most of it occurs in a few bodies along the Schenectady County line southwest of Pattersonville, and a small area is about 1 mile northwest of Glenville.

The 7-inch surface soil in most places is dark grayish-brown mellow friable gritty silt loam. It is underlain by medium-brown or yellowish-brown granular gritty silt loam, which becomes somewhat more compact at a depth of 18 to 20 inches. The next few inches of soil is generally light-yellow or dull brownish-yellow heavy silt loam stained with gray and rusty brown. This material grades into dark brownish-gray silty clay loam, which is slightly plastic when moist but when dry breaks into subangular granules. The subsoil between

depths of about 30 and 50 inches consists of very dark brownish-gray or very dark brown smooth heavy silty clay material mixed with moderate quantities of partly decomposed dark shale fragments. This material has a more or less platy structure as it grades below into beds of thinly laminated dark shales.

On the surface and throughout the upper soil layers are small quantities of mixed sandstone, shale, granite, and limestone cobbles, small boulders, and pebbles. They are scattered enough so that they do not interfere with cultural operations and easy use of farm machinery.

The soil has an undulating to smooth surface, which is desirable for farm practices. Drainage is adequate, and the moisture-holding capacity is excellent. During dry seasons, crops appear to suffer less from lack of moisture than on the surrounding soils.

Except for a few farm wood lots, Poland silt loam is cleared for farming. A combination of general farming and dairying is the accepted system on this land. The principal crops are corn, hay, oats, and buckwheat. This is considered an excellent soil for general farming, and yields obtained are among the highest in the area. Considerably more than one-half of the soil is in grass for hay and pasture, mainly timothy and clover, mixed in varying proportions. Alfalfa is grown and is readily established. Few permanent pastures are maintained, but the use of some fields for a few years is often a step in the rotation of crops. Nearly all of the crops grown are fed on the farm. The yields of crops on this soil are above the average for the county. Hay yields 1 to 2½ tons an acre, corn 50 to 80 or more bushels, and oats 30 to 65 bushels. Some of the corn crop is cut for silage. Some commercial fertilizers are used in addition to the manure produced on the farm.

### SHALLOW WELL-DRAINED SOILS

**Farmington silt loam.**—Most of this soil is on the Appalachian Plateaus of Albany County. The principal areas extend from a point south of Township southeasterly to a point north of Thompsons Lake, narrowing along the bluffs through John Boyd Thacher Park, broadening between New Salem and Clarksville, and extending irregularly southeasterly to a point west of Unionville, Feura Bush, and South Bethlehem and to the south county line at Aquetuck. A small area occupies the extreme northwestern corner of Schenectady County. The total area is fairly large.

Farmington silt loam consists of thin layers of brown or grayish-brown soil material resting at varying but slight depths on limestone, or, in a few places, on calcareous shale or sandstone. The depth of the soil mantle ranges from 3 to 30 inches and changes with every few feet of horizontal distance. The surface layer is dark-brown or grayish-brown silt loam, and at a depth of 4 to 6 inches it is succeeded by lighter colored material or yellowish-brown light silt loam, which rests on the underlying limestone bedrock. In places a 1- to 2-inch layer of rich-brown or light reddish-brown granular silt loam, weathered from the limerock, lies immediately over bedrock.

A few small spots of the more shallow soil material consist of strong rich-brown or light reddish-brown mellow silt loam, called by some "cocoa soils." Where the soil mantle is but a few inches thick,

little variation in color and texture is observed, but in areas of deeper soil the subsoil is lighter brown than the surface soil.

Small quantities of angular rock fragments are scattered over the surface and through the soil. They are largely limestone of local origin, with some sandstone, granite, and gneiss. Bare rock with deep cracks, small ledges, and outcrops of the limestone are common in all areas.

The land ranges from undulating, smooth, or slightly uneven areas to sharp escarpments separating different levels. The soil tends to be droughty because the underlying rock formations lie so close to the surface, and consequently cultivated crops and grasslands often suffer from lack of soil moisture.

Approximately 25 percent of the soil is cleared of trees, and the rest is in pasture or is wooded. Wooded areas include a mixed stand of evergreens and hardwoods. Agriculture is fairly well developed on certain selected areas of deeper soil. A practice of general farming in conjunction with dairying is carried on with moderate success. Corn yields from 21 to 40 bushels an acre, oats 21 to 30 bushels, and buckwheat 15 to 25 bushels, and hay averages about 1 ton. On account of the variable depth of the soil to rock, the growth of crops is uneven over the same field. Some truck is produced, and some farmers grow small fruits, such as strawberries and red raspberries, for the local trade.

The acreage of cultivated land in proportion to the size of the farm is small. Crops are rotated, and some commercial fertilizer is applied. Most of the dairies are small, but the cows are good grade animals. The average land value of Farmington silt loam in this area is low, and little of this soil is in demand at present.

**Lordstown silt loam.**—Lordstown silt loam predominates in southeastern Knox Town, northern and eastern Rensselaerville Town, eastern Westerlo Town, and western Coeymans Town. Smaller scattered areas occur in many parts of the plateau section. This is the most extensive soil in the area.

Lordstown silt loam is one of the shallow soils of the area and shows very little development into separate layers. The color of the upper part of the soil, however, is influenced to some extent by its organic-matter content. The surface soil is generally brown or grayish-brown gritty silt loam, which at a depth of 4 to 7 inches grades into yellowish-gray or light brownish-yellow friable silt loam. This continues downward to a depth ranging from 15 to 30 or more inches, where it rests on bedrock of thinly bedded sandstone or shale. The material immediately above the bedrock in many places is more or less compact and mottled with rusty brown, where ground water accumulates temporarily above the rock. Mixed through the soil material are varying quantities of small platy angular flaggy fragments of sandstone, from 1 to 6 inches in diameter, together with chips of shale, from 1 to 2 inches in diameter. In places this content of flaggy material is negligible, whereas in others it seriously impedes cultivation. Scattered granite, gneiss, and quartzite rock fragments are common, but most of the rock content is of the same kind as the underlying bedrock. The soil material is acid throughout.

Where shale underlies the soil mass, a 2- or 3-inch layer of yellowish-brown and gray mottled silt loam or silty clay developed from the

easily weathered shales, occurs next to the rock in most places. Here and there rock outcrops as small ledges on slopes separating one level from another. A few acres of Chippewa silt loam or of Manlius shaly silt loam, too small to indicate separately on the map, are included.

The surface generally is smooth or somewhat sloping, undulating, and in places rather uneven. In many places the surface is varied by a series of narrow irregularly elongated smooth benches of step-like formation, which break off abruptly or merge into higher or lower surfaces of similar relief. Such benches range in width from about 30 to 200 or more feet, with local differences in elevation ranging from 4 to 15 or 20 feet. Drainage waters move through the porous soil easily and pass into drains or into seams in the underlying rock.

Considerable areas at some time have been cleared and used for cropping purposes, but, owing to competition of more productive lands, large areas have reverted to pasture or idle land. Probably not over 15 to 20 percent of the total area is now regularly cultivated. In places where basins or slight depressions occur, the water may remain and keep the soil wet for considerable periods.

The soil is not highly valued for agricultural use, on account of its stone content, high elevation, generally low fertility, and the expense involved to maintain productivity. Though lumbering operations removed all the original timber, scattered areas ranging in size from a few to 300 acres are covered with a second growth of trees that include species of maple, oak, elm, aspen (poplar), beech, cherry, and other hardwoods. A considerable acreage is abandoned or idle land or is in permanent pasture and covered with a mixture of plants including poverty oatgrass, redtop, wild carrot, dandelion, red sorrel, goldenrod, sumac, hazel, aster, buttercup, Canada thistle, quackgrass, daisy, and other weeds that hinder the growth and spread of good pasture grasses.

Farms well managed and maintained in the larger areas of this soil are few and scattered. Some hay, oats, potatoes, buckwheat, and corn are grown in connection with dairy farming. Results are frequently discouraging, therefore many farms have been abandoned. This is attested by the large number of unoccupied dwellings and buildings in various stages of depreciation and ruin. Yields of crops are lower than the average for the area, and it is difficult for farmers on this soil to compete with farmers on more productive soils.

Some poultry is raised on a commercial scale, and such ventures are usually more successful than general farming. A few farmers raise sheep. Very little commercial fertilizer is applied to the land, and the quantity of barnyard manure available is seldom sufficient to maintain desired productivity. The land has a low selling value, and little of it changes hands for farming purposes. Certain selected areas with a deeper soil than the average produce fair yields. Most of the areas successfully farmed are farmed in connection with more productive adjoining soils and receive the system of management practiced on the associated soil. The practical utilization of most of this land, however, is for timber or grazing.

**Angola silt loam.**—This soil is associated with the Lordstown, the Allis, and in places, the Langford soils. In this area Angola silt

loam is identified in a few areas on the higher elevations of southwestern Schenectady County. This soil differs from Allis silt loam in that it is developed from calcareous shaly rock and is somewhat better drained.

The surface soil normally consists of light-brown or grayish-brown friable silt loam or gritty silt loam. At a depth of 6 or 7 inches it grades into grayish-brown or light yellowish-brown friable silt loam that becomes more yellow with increased depth. At a depth of 15 to 18 inches there begins a more compact silt loam or heavy silt loam of grayish brown stained or mottled with rusty yellow and gray. Bedrock of shale and a little sandstone is reached at a depth ranging from 24 to 30 inches in most places, and it is calcareous enough to effervesce with acid. Some included areas have color and structure profiles much the same as those of Lordstown silt loam.

Drainage is fairly well established. The surface for the most part is smooth, somewhat undulating, or sloping. The alkaline condition of this soil gives it an advantage for thriftiness of crop cover over Lordstown silt loam.

**Lackawanna silt loam.**—The chief areas of Lackawanna silt loam are in western Rensselaerville Town, and small areas are in southwestern Berne Town, where they occupy the higher elevations.

The surface soil generally is brown or reddish-brown friable gritty silt loam. This changes at a depth of about 7 inches to light brownish-red or light-red gritty silt loam, which continues to a depth ranging from 20 to 30 inches, where the soil rests on thin-bedded brown or red sandstone and shale. The rocks in places are interbedded with gray and greenish-gray material. In a few places, as on Scott Patent Hill, the surface soil is more distinct red or Indian red, more typical of the Lackawanna soils as developed outside these counties in areas where they are more extensive. The soil contains some gravelly and stony fragments. Here and there are small areas in which only a few inches of soil lies over the bedrock and in which narrow rock ledges are exposed at different levels.

The surface ranges from nearly level to sharply sloping. Drainage is good.

Possibly one-half of the total area is cleared and at some time has been cultivated. Most of it is now idle, abandoned, timbered, or used for pasture. The State has acquired some tracts for reforestation. A few farms on perhaps 5 percent of the total area seem to be operated with fair success, where crops are grown to support dairy farming. The usual crops of corn, oats, buckwheat, and hay return fair yields when the land is well managed. In neglected pastures the palatable grasses are soon replaced by such weedy plants as poverty oatgrass, devil's-paintbrush, cinquefoil, strawberry, wild dewberry, briers, haw, and trees. Considerable areas are exposed to high prevailing winds in winter, which add to the undesirability of the land.

### IMPERFECTLY DRAINED SOILS

**Langford gravelly silt loam.**—Langford gravelly silt loam is distributed more or less throughout the western plateau section of the area and is associated especially with the Erie, Pittsfield, and Lordstown silt loams. A large total area is mapped.

The surface soil consists of grayish-brown or light-brown mellow friable somewhat gritty silt loam. Between depths of about 8 and 17 inches is light brownish-yellow friable gritty silt loam becoming somewhat heavier and more compact in the lower part. This passes abruptly into compact dull-gray gritty silt loam or silty clay loam, variably mottled rusty yellow, rusty brown, and yellow. Below a depth of 20 to 22 inches this material becomes tight compact gritty silty clay loam, generally of hardpan character, variously mottled and stained with light gray, rusty yellow, and brown. Below a depth of 30 to 34 inches the lower part of the subsoil is less dense but compact and contains fainter rusty-colored and gray mottles. This material grades into slightly weathered compact and somewhat calcareous gritty glacial till, which is several feet thick. An abundance of fine gray and rusty-colored shale and gray sandstone fragments is on the surface and throughout the soil mass. In some areas, such as bordering areas of the Lordstown soils, large irregular slabs of sandstone are strewn over the surface. In addition, scattered fragments of gneiss, granite, and quartzite are common. The upper soil layers are invariably acid in reaction, the compact subsoil is generally slightly acid to alkaline, and the unweathered glacial till is invariably alkaline.

Langford gravelly silt loam differs from Erie silt loam in having a browner surface soil and fewer or no mottles in the subsurface layer. The Langford soil characteristically occupies rounded elongated drumlike ridges or slopes and flatter high positions, whereas the Erie soil occurs on more sloping, relatively lower positions of subdued local relief.

The characteristic slopes of Langford gravelly silt loam favor good surface drainage and, to some extent, internal drainage, so that drainage is adequate for most crops. The moisture-holding capacity is good and ordinarily ample to meet crop requirements in rather dry seasons.

Numerous scattered timbered areas and farm wood lots include growths of maple, beech, hemlock, pine, birch, hawthorn, dogwood, wild cherry, and sumac. Approximately 25 percent of the total area is in timber. A large part of the rest is in temporary and permanent pasture and hay land. Probably 25 to 30 percent is cultivated more or less regularly, but a larger proportion was cultivated in former years. Dairying and general farming prevail on farms occupying this soil. These farms in general present a more prosperous appearance than those including largely Erie silt loam. The chief crops are corn, oats, buckwheat, clover, and timothy. Some farmers have successfully established stands of alfalfa from which two and sometimes three cuttings a year are made. General crop yields average slightly higher than those obtained on Erie silt loam.

**Canfield silt loam.**—This soil occurs only in the southwestern part of Albany County, where it occupies smooth rounded ridges and sloping positions. Its topographic features are the same as those of Langford silt loam.

In most places the cultivated surface soil is light grayish-brown friable silt loam, which at a depth of 8 or 9 inches grades into yellow or light brownish-yellow friable somewhat firmly bedded silt loam. Beginning at a depth of 16 to 18 inches is yellowish-gray compact gritty silt loam, with rusty-brown, yellow, and brown variations. Below

a depth of about 24 inches is a hardpan of gritty silt loam or silty clay loam, mottled gray, rusty brown, and dark brown. Mixed throughout the soil mass are moderate quantities of gray angular and platy sandstone fragments sufficient to modify slightly the structural and tillage qualities. In many places some larger stones have been removed to fence rows. The reaction is acid throughout to the depth of the profile commonly observed, but at a depth ranging from 10 to 15 feet the reaction may be alkaline.

This soil is associated in many places with Volusia silty clay loam and to some extent with Erie silt loam, both of which have heavy and compact subsoil layers closer to the surface and are less well drained. The flatter areas of Canfield silt loam approach these conditions in some places.

Canfield silt loam is used for general farm purposes, with dairying the leading agricultural enterprise, and crops are grown primarily to support dairying. Corn, mostly for silage and fodder, gives yields of 5 to 7 tons, oats 30 to 40 bushels, and mixed hay and clover 1 to 1½ tons. Unless limed, the soil does not produce satisfactory stands of clover or of most other crops. Generally the soil lacks organic matter and when this is supplied either through stable manure or cover crops the productive capacity is stimulated.

**Culvers silt loam.**—Culvers silt loam is associated with Lackawanna silt loam in the western part of Rensselaerville Town.

As generally observed, the surface soil is grayish-brown or medium-brown friable rather gritty silt loam, underlain at a depth of 6 to 7 inches by light yellowish-red or pale-red friable silt loam. At a depth of about 12 inches this material becomes more compact and consists of pale reddish-brown crumbly gritty loam, which in the next few inches contains some slight staining of brown and yellow. Between depths of 18 to 20 inches and extending to more than 36 inches the material is compact clay loam or silty clay loam, approximating a hardpan. The color is brownish-red mottled with brown and yellow or, in places, merely streaked with brown and yellow along cleavage planes. The substratum is compact reddish-brown gritty clay loam. Moderate quantities of angular brown or light-red pieces of sandstone, ranging from small gravel to large platy or flaggy fragments, are generally present throughout. Most of the latter have been removed from the improved land to fence rows. The upper horizons are medium to strongly acid in reaction, and the parent material is slightly acid. The parent material comes from the brown and light-red coarse-grained sandstone of the locality, with some grayish-brown sandstone and other components intermixed by glacial action.

Most of the areas occupy rounded smooth slopes, many grading down from the higher lying areas of Lackawanna silt loam. A large percentage of this land is smooth enough for fairly easy cultivation, although considerable areas have sufficient slope to induce destructive erosion unless carefully managed. Surface drainage is adequate, and internal drainage is imperfect.

Considerable areas have been cultivated more or less regularly in the past, but now perhaps not more than 15 percent of the land is devoted to crops. The larger part is in pasture or timber or is idle land. When well handled, land of this kind gives good average returns

of the common dairy subsistence crops. Good stands of timothy and clover can be established, but when these decline they are replaced by such species as poverty oatgrass, goldenrod, and briers, especially in old fields and pastures.

**Schoharie silt loam.**—Schoharie silt loam is mapped only in several areas along Schoharie Creek in western Schenectady County and in one area at Potter Hollow in southwestern Albany County.

The 3- to 5-inch surface layer is grayish-brown or light-brown smooth fairly friable silt loam or heavy silt loam. Underneath this and extending to a depth of 10 to 12 inches is brown or light-brown smooth granular silt loam, in many places stained in the lower part with gray and brown. This passes abruptly into dull-brown slightly compact silt loam or silty clay loam streaked lightly with light gray, rusty yellow, and brown. At a depth of about 18 inches this material rests on light reddish-brown or bright-brown heavy silty clay or light clay. When fractured, the materials break into irregular angular fragments. Below a depth ranging from 24 to 30 inches the color becomes lighter and the material becomes a strong-brown or light-red compact smooth silty clay generally laminated with brown silty material. In most places the clay material is many feet thick. Here and there are small quantities of small stones and angular gravel, but not enough to interfere with tillage. Normally the soil is neither gravelly nor stony, but some gravel particles and stones occur where the soil grades into other soils, such as the Erie or Culvers. The surface layers are acid, but the clay subsoil is generally alkaline, and the lower part of the subsoil and the substratum contain free lime or lime nodules in many places.

Two miles northwest of Esperance Station the soil mapped as Schoharie silt loam has a loam surface soil and is more porous and friable throughout than is typical. The surface soil is grayish-brown or light-brown gritty loam containing moderate quantities of small pebbles of sandstone and crystalline rock. The subsurface soil is light-brown or yellowish-brown material of similar texture, generally spotted or stained with gray or rusty brown at a depth of 14 to 16 inches. At varying depths below this is light reddish-brown silty clay loam or light clay, which gives way abruptly to the heavier red clay typical of the prevailing soil.

From some of the slopes leading to drainageways, sheet erosion has removed a large part of the original surface soil, and here the plow now turns up light-red clay. This creates a textural condition rather difficult to manage when the soil is not worked under proper moisture conditions.

Schoharie silt loam occupies level to slightly undulating areas, for the most part, but some of the intermittent drainageways have cut some areas into belts of steep land. External drainage is generally fairly good, but internal drainage is somewhat slow. Some of the areas transitional to Erie silt loam contain deficiently drained springy and seepy spots, and in such places the soil is noticeably darker than elsewhere and the subsoils are mottled and soggy.

By far the largest acreage, probably 95 percent, is cleared and used for crops, hay, or pasture land. The principal crops are hay, oats, and corn. Profitable yields are obtained, generally averaging above

300781—42——4

those for most other soils of the area. Dairying is the main industry, and crops are grown entirely to support this industry. Some commercial fertilizers are used with grain crops, and recognized crop rotations are followed. In places good stands of clover and alfalfa have been established, and most pastures have a good sod of bluegrass and other palatable species. Many farms present a thrifty appearance, and this type of land seems well suited to dairy farms. Some farms, however, are idle.

Gullied, broken, and less favorable areas are covered or bordered by fringes of such hardwood trees as elm, hickory, white oak, locust, and ash.

**Erie silt loam.**—This soil is the dominant upland soil in the western part of Schenectady County south of the Mohawk River and in the northwestern part of Albany County. It becomes increasingly less prevalent southward from Knox Town.

The cultivated surface soil under average conditions consists of medium grayish-brown or dark-brown friable silt loam. Under a forest or established grass cover, the soil is darker than in cultivated areas and the root systems break up the soil, which when dislodged clings to roots in small crumblike aggregates. Below a depth of 5 or 6 inches is light brownish-yellow or brownish-yellow moderately friable silt loam, which within a depth of a few inches generally becomes less friable and paler yellow, mottled with gray and yellowish brown. Darker streaks, marking worm tunnels, and worm casts are common. This material grades at a depth of 12 to 14 inches into compact heavy silt loam or light-gray clay loam, in many places of the consistence of a brittle hardpan, mottled gray, yellowish brown, and rusty brown. This material grades below a depth of 20 to 22 inches into dense medium grayish-brown gritty clay loam with variable streakings or mottlings of gray, rusty brown, and dark brown. The substratum lies about 36 inches below the surface and consists of moderately compact grayish-brown gritty clay loam or less stained and mottled with gray and rusty brown. In some places the soil material is weathered largely from shale fragments. This causes the texture to be heavier than the soil material derived largely from sandstone materials. Variations in profile characteristics range from those of the less well drained Chippewa soils as developed in depressions and on the lower slopes of the many parallel ridges, on the one hand, and those of the Langford soils as generally observed on upper grades of slopes and on some of the low ridges, on the other.

In general the surface layers have an acid reaction, the heavier subsoil is slightly acid or neutral, and the substratum in many places contains accumulations of secondary lime. Throughout the profile are varying quantities of flat angular fragments of sandstone and shale, largely of local origin, in different stages of decomposition, but their size and abundance in few places is sufficient to interfere greatly with cultivation. There are some scattered granite, gneiss, and crystalline cobbles and boulders, but most of them have been removed to fence rows.

Along some of the lower slopes adjoining streams and drainageways the surface soil is deeper and browner than typical and approaches the color of the Langford soils.

The soil occupies the tops and slopes of more or less parallel low ridges, where the surface is smoothly sloping, level, or undulating. Drainage ranges from fair to deficient, and the compact subsoil and parent material make artificial drainage difficult.

Timbered areas include a mixture of hardwoods and conifers. These are hemlock, white pine, hickory, elm, ash, birch, basswood, white oak, beech, quaking aspen (poplar), and maple, with inclusions of hawthorn, seedling apple, chestnut, wild cherry, sumac, and ground hemlock.

This soil is moderately productive and has some agricultural significance. Considerable areas, probably 60 percent of the total area, have been cleared of timber. The greater part of the cleared land is utilized for pasture and mowing. This use fits in with the dairy farming of the section. The main farm crops are corn (mostly for silage), oats, buckwheat, and clover and timothy hay. The shallower soil variations are neither suitable for clover nor satisfactory for other cultivated crops. On some of the variations of deeper soil, alfalfa produces fairly satisfactory stands. Fair success is realized with wheat, millet, and potatoes. Yields vary with seasonal conditions and with the ease of soil drainage. A few fairly thrifty commercial orchards are established on the better drained and deeper parts of the soil, and most farms have some fruit trees, although they generally receive little care. As a whole, Erie silt loam cannot be recommended for orchards or for alfalfa.

**Volusia silty clay loam.**—Volusia silty clay loam is mapped only in the southern parts of Albany County in the towns of Rensselaerville and Westerlo, mainly in association with Canfield and Chippewa silt loams. It occurs in small irregular-shaped areas, ranging from 50 to 100 acres in size, on gentle slopes, in sags, and in slight depressions where there is seepage of water or slow run-off.

The surface soil consists of brownish-gray friable silty clay loam, about 7 inches thick, generally containing moderate quantities of angular sandstone gravel. On drying, the soil assumes a characteristic gray color and in cultivated fields shows surface cracks. The surface soil grades into moderately compact light-brown or yellowish-gray silty clay loam, in many places slightly mottled at a depth of 12 or 14 inches with rusty yellow. This material, in turn, grades into dense compact silty clay loam, of hardpan consistence, mottled gray, yellow, and rusty brown. Below a depth of about 22 inches the material becomes less dense but is decidedly compact and is mottled dull brown, gray, and yellow. This continues to a depth of 3 feet or more. Sandstone fragments of varying sizes are scattered more or less through the solum. The soil is strongly acid in reaction but generally is less so at a depth of 4 feet.

It is not easy to put this deficiently drained and somewhat intractable soil into good tilth, and crop yields are often low. Hay and grass crops seem best adapted, and most of the areas support this kind of cover. Clovers are not well adapted, and, when the land is not regularly cultivated and fertilized, improved grasses soon run out and poverty oatgrass, goldenrod, cinquefoil, and other weedy plants come in. Corn gives indifferent yields and oats and buckwheat but moderate

yields. Probably not over 20 percent of the land is now cultivated. More of it has been cultivated but is now used for pasture or timber lots.

### POORLY DRAINED SOILS

**Chippewa silt loam.**—Chippewa silt loam is associated with the Erie, Langford, Canfield, Volusia, and Lordstown soils of the Appalachian Plateaus.

The character of the soil varies from place to place. In representative areas it has a surface soil of very dark gray or dark brownish-gray moderately friable silt loam or silty clay loam about 8 to 10 inches thick. Beneath this is a much lighter colored, generally light-gray silt loam or silty clay loam, in places varied with rust-colored, yellow, and brown mottles. At a depth of 16 to 20 inches the subsoil is compact and hard and consists of gritty dull-gray silty clay highly mottled with light-gray, rusty-yellow, bluish-gray, and brown variations. The lower part of the subsoil, beginning at a depth ranging from 30 to 40 inches, is brownish-gray or bluish-gray tight gritty silty clay mottled with light gray and rusty brown, but it is not so intensely colored as the layer above. This material continues downward for several feet. Variable quantities of angular and platy sandstone and shale chips, together with scattered chips of granite and crystalline rock, are intermixed through the soil mass. The upper soil layers are prevailingly strongly to medium acid, but the subsoil in many places is neutral to alkaline, especially where the soil adjoins soils containing alkaline constituents.

A shallow variation of this soil is associated with the Lordstown soils, especially in southern Berne Town and northern Rensselaerville Town, where it occurs in scattered poorly drained depressions or basins, generally from 50 to 200 feet wide and ⅛ to 1 mile long. This inclusion is rather variable but generally has a dark-gray heavy silty loam or silty clay loam surface soil, underlain at a depth of 8 to 10 inches by light-gray compact silty clay loam freely mottled with rusty yellow. Below a depth ranging from 18 to 25 inches the material grades into rusty-yellow and gray mottled gritty tight clay, which, at a depth of 30 to 35 inches, rests on beds of sandstone or shale. The entire soil is acid in reaction.

Chippewa silt loam typically occupies flats, depressions, and basins, where it is subject to seepage from surrounding areas or from which surface waters pass very slowly. The compact subsoil restricts ready downward movement of water, and the soil material is saturated for long periods during the year.

For the most part, the soil is allowed to remain idle or is used for permanent pasture. The natural vegetation provides inferior grazing, as it consists mainly of coarse moisture-loving unpalatable grasses and many different weeds. A few areas provide mowing. Some of the broader flats or outer margins are sometimes cultivated for buckwheat and oats, and often corn, but yields are influenced by seasonal conditions controlling local drainage. Despite the good potential productivity of this land, poor drainage limits its profitable utilization.

**Norwich silt loam.**—Several small areas of Norwich silt loam are scattered within larger areas of Culvers silt loam and Lackawanna

silt loam, where they occupy swales that are more or less wet during the entire year. The soil material contains a noticeable quantity of red and brown sandstone. The dark-gray silt loam surface soil is underlain by brown, gray, and yellow mottled silty clay. Except for differences in the parent material, this soil is about the same as Chippewa silt loam. No use is made of these areas aside from the scant pasturage they afford.

**Lyons silt loam.**—Lyons silt loam is developed in only a few small scattered areas associated with areas of the Farmington and Pittsfield soils.

The surface soil to an average depth of about 7 inches is dark grayish-brown or dark-gray moderately friable silt loam. In places more favorable for the accumulation of organic matter the color is more nearly black, and in flatter or more sloping areas the color is lighter. Beneath the surface soil is generally a grayish-brown slightly friable silt loam, which becomes mottled with gray, yellow, and rusty brown and more compact with depth. At a depth of about 20 inches the soil has a silty clay texture. Below this, the material grades into gray or bluish-gray compact silty clay variously mottled rusty brown and light gray. Some limestone, sandstone, and shale chips and gravel occur throughout the soil. The surface layers generally are alkaline, and the subsoil in many places effervesces with acid.

The soil occurs in elongated narrow depressions and indefinite drainageways and small bodies, most of which do not exceed one-half mile in length, although a few strips are as much as 1 mile long. Most of these areas have such poor drainage that they are reserved for pasture or mowing. A few somewhat better drained areas produce fair crops. Corn for silage often yields well in drier seasons. Small grains tend to produce too rank and weak stalks. Good grazing is provided by bluegrass, white clover, and timothy and other grasses. Some areas support more or less timber.

**Allis silt loam.**—Only a few small areas of Allis silt loam are mapped, about 5 miles northwest of Rensselaerville.

The surface soil to a depth of about 6 or 7 inches is grayish-brown or brownish-gray gritty gravelly silt loam. Beneath this is a gray compact plastic silt loam, streaked light gray and yellow, that becomes lighter gray, variously mottled with gray and rusty brown, and more plastic with depth. Bedrock of dense highly mottled shale and sandstone lies from 18 to 24 inches below the surface.

Areas of this soil form narrow strips and small depressed swales within broader bodies of Lordstown silt loam, and they are intermediate in character between the latter soil and Chippewa silt loam. Some areas too small to map separately are included with the Lordstown soil. All this land is in timber or pasture or is idle, as the poor drainage does not encourage better uses. Poor-quality pasture plants and weeds, including much poverty oatgrass, cinquefoil, devil's-paintbrush, buttercup, and briers, and some white clover, redtop, and bentgrass cover much of the soil. The tree growth includes elm, wild cherry, alder, and hawthorn, and there are also various shrubs.

STEEPLY SLOPING SOILS

**Poland silt loam, steep phase.**—In a few places the outer boundaries of Poland silt loam are narrow, broken, and steep and are separated as Poland silt loam, steep phase. Some slopes are considered too steep to clear for cultivation and are allowed to remain in wood lots; others have been placed under cultivation and farmed in the same way as typical Poland silt loam, or maintained in pasture. Because of its steepness, this soil is more difficult to cultivate and handle than the normal soil and yields are lower. Some of the cultivated fields have suffered sheet erosion and in places have developed small gullies.

**Lackawanna stony silt loam, steep phase.**—The steep phase includes areas that are much steeper, somewhat more broken, and more stony than typical Lackawanna silt loam. For this reason the land is unsuited for cultivation and either remains in hardwood timber or is used for pasture. Much of it is idle. The soil is similar to Lackawanna silt loam except that it has more brown and red sandstone fragments on the surface.

**Lordstown silt loam, steep phase.**—The steep phase is distinguished from typical Lordstown silt loam on the basis of relief. The slopes are so steep as to make the land almost entirely unsuitable for agriculture. The soil generally is thin with numerous outcrops of underlying rocks and loose flaggy stone fragments on some of the surface. Here and there a tract is cleared and used for pasture, but most of the land remains forested with second-growth hardwoods and some pine and hemlock.

**Langford gravelly silt loam, steep phase.**—The steep phase of Langford gravelly silt loam occupies steep slopes of the hills and drumlins of the normal soil type, where the slope is so great as to make cultivation difficult and to subject the land to destructive erosion. Many gullies already are present, and eroded spots are common. There is much evidence of hillside soil creep and variable soil character. Small seepy spots are a common feature. Smoother and less steep included areas have soil of about the same value as the normal soil. The steep soil has little value except as pasture, and much of it has about the same pasture value as the typical soil. Considerable areas are covered with hardwood timber and some conifers. In the southeastern part of Albany County this soil occurs in the same general location as does Albia silt loam.

As mapped this soil includes areas of Pittsfield silt loam so steep or of such irregular relief that cultivation is difficult or the soil is subject to serious erosion, and use for other than the growth of pasture or timber would be unprofitable. Except for certain more favorable small spots, land of this character is reserved for these uses. The surface is marked by some gullies and eroded spots and general steepness and unevenness. Fairly good pasture of bluegrass and bentgrass, white clover, and fescues and other grasses are maintained in some places. This included soil occurs mainly south of Berne, and there are a few smaller areas in other places.

**Culvers silt loam, steep phase.**—The steep phase of Culvers silt loam is much the same as the typical soil, but it includes the steeper

slopes, in most places flanking stream courses. These areas are too steep for profitable cultivation and in places include ravines. A few seepy spots are included. Practically all of this soil is in pasture or timberland or is idle.

## SOILS OF THE FLOOD PLAINS

The soils of the flood plains include Genesee silt loam and Tioga silt loam, each with a high-bottom phase, and Genesee fine sandy loam, Eel silt loam, Middlebury silt loam, and Wayland silt loam.

Both the Genesee and Tioga soils are well drained. Genesee silt loam is neutral or alkaline in reaction, and it is more productive than Tioga silt loam. As mapped it includes a fine sandy loam variation, which, near the urban centers, is used for market-garden crops, especially sweet corn. The Tioga soils are well drained and are acid in reaction. The Eel soils differ from the Genesee soils mainly in that they are imperfectly drained. The Middlebury soils differ from the Tioga soils likewise in that they are imperfectly drained. The alkaline Wayland soils are more poorly drained than the Eel soils. Much of the less well drained alluvial soils is either uncleared or used for pasture. Selected better areas are cultivated or used as mowing land.

### WELL-DRAINED ALLUVIAL SOILS

**Genesee silt loam.**—Genesee silt loam is one of the most productive soils in the area. Typically, it consists of a deep surface layer of dark-brown mellow light silt loam, the upper 4 to 6 inches of which are somewhat darker colored as the result of a higher content of organic matter. At a depth of 12 to 18 inches the soil becomes lighter colored and is brown moderately firm but friable and pervious silt loam, only slightly heavier textured than the material in the upper part of the subsoil. Substrata consist of interstratified silty alluvial materials.

This soil has developed from successive deposits of alluvial materials in valley lands. Because of the varying influence of floodwaters, this sedimentary material includes wide color and textural variations within short distances. In some places there are interbeddings of brown loam or fine sandy loam; in others gravelly material is fairly abundant. For the most part, however, the soil is free of stone to a depth ranging from 4 to more than 8 feet. The reaction is generally alkaline from the surface downward, and in this respect the soil differs from Tioga silt loam, which it resembles in color and texture.

In general the soil is well drained and warms quickly in the spring. Within the larger bodies are small narrow depressions, a few feet lower than the surrounding part. These basins generally are somewhat more silty than typical and may remain wetter for longer periods on account of receiving some drainage from the higher land; but this is not a serious factor in their utilization for crops, as such spots do not hold excess water long.

Genesee silt loam is considered an excellent general farming and trucking soil, and practically all of it is cleared and farmed. Its

main, most extensive development is along the Mohawk River near Schenectady and along the Hudson River. Most other areas occur as long, narrow strips along Normans Kill and along Coeymans and Onesquethaw Creeks. This soil has a flat surface and lies from 4 to 15 feet above normal stream level. High floodwaters sometimes hinder early cultural operations, but the good drainage, strong fertility, and easy handling of the soil overcome this temporary handicap.

The original heavy forest growth was removed early in the agricultural development of the area as the productiveness of this soil was quickly appreciated. At present only a few hickory, maple, poplar, willow, and elm trees remain along stream channels. Alfalfa, clover, timothy, corn, oats, buckwheat, potatoes, and vegetables are grown with success and profitable yields.

Alfalfa yields from 2 to 3 tons an acre from two cuttings a season. Clover and timothy yield 1½ to 2½ tons of hay an acre. This is an excellent soil for corn, and this crop responds with yields as high as 100 bushels an acre. Excellent yields of sweet corn are obtained. Vegetables are grown principally for family subsistence, and a small surplus is marketed locally. Certain areas provide excellent pasturage.

**Genesee silt loam, high-bottom phase.**—The high-bottom phase of Genesee silt loam is recognized in two small areas along Normans Kill, one about 1 mile south of Guilderland and another about 1 mile west of McCormack Corners.

This soil has about the same characteristics as the typical soil. Scattered gravel and a few sandy variations modify the soil here and there. The reaction is generally slightly acid near the surface. The surface lies sufficiently high to be above any but exceptional stream overflows. Most of the land is cleared and used profitably for general and specialized crops.

**Genesee fine sandy loam.**—Genesee fine sandy loam occurs in a few rather narrow belts in association with Genesee silt loam and other alluvial soils. It borders principally the Hudson River and, in places, Normans Kill and the Mohawk River where swifter overflow currents along main channels and in bends of the streams have deposited the coarser materials.

The 7- or 8-inch surface layer consists of brown or dark-brown friable fine sandy loam. This grades below into lighter brown fine sandy loam or, in places, loam that may be somewhat firm in place. Below a depth of 28 to 30 inches the material is looser and more friable and in many places contains considerable sand and gravel. Some locations show a somewhat looser condition of the profile, and in others the lower part of the subsoil is slightly mottled because of deficient drainage.

The areas have a smooth surface and are well suited for a variety of crop uses. Some of them are used successfully for corn and a variety of vegetable truck crops.

**Tioga silt loam.**—Tioga silt loam is characterized by a uniform dark-brown or grayish-brown mellow smooth silt loam surface soil that continues downward to a depth ranging from 15 to 22 inches. Below this is a layer of light-brown granular somewhat firm but friable silt loam without any important change to the gravelly or sandy substratum, which lies from 4 to 10 feet below the surface.

The lower part of the subsoil in spots is slightly mottled with light gray—a result of deficient drainage. Generally such conditions are only slightly reflected in the response of crops. The reaction is strongly to medium acid throughout.

Minor color and textural changes are common but are not noticeably reflected in crop yields. The soil shows some stratification and includes layers of slightly heavier or lighter textured material. As mapped, there are small inclusions of very fine sandy loam texture in the surface soil.

A loam or fine sandy loam variation associated with the high-bottom phase of this soil borders the channel of Schoharie Creek. This consists of stratified layers of brown silt loam and fine sandy loam without definite arrangement as to depth or continuity of the several textures. This included soil is loose and porous, and water drains away so rapidly that the soil tends to be droughty. Only a few acres are cultivated, and the greater part is covered with pasture grasses, weeds, and small clumps of trees.

Areas of Tioga silt loam indicated on the map by gravel symbols are readily distinguished by the presence of a large number of stone fragments mixed through the soil material. The 4- to 8-inch surface layer is grayish-brown gritty silt loam or gravelly loam. It is underlain by light-brown or yellowish-brown gritty material of similar texture extending to a gravelly substratum at a depth ranging from about 15 to 30 inches. In places the lower part of the soil profile is slightly stained gray or rusty yellow. Stones are abundant and comprise a large proportion of the soil mass. They include principally rounded, flat, and angular fragments of sandstone and shale but have inclusions of crystalline rocks and limestone varying in size from small pebbles to large cobbles and boulders 6 to 15 or more inches in diameter. In many places the stony fragments greatly hinder cultural operations. This gravelly variation of Tioga silt loam occupies mostly the upper part of narrow valley heads or ravines, which frequently are bordered by steep sides from 20 to 50 or more feet high. This is the principal first-bottom soil of the streams in the southwestern part of Albany County. The soil along Catskill Creek contains a considerable proportion of reddish-brown soil material like that which characterizes the Barbour soils. A few areas of the gravelly inclusion are cleared entirely of native trees, but others are now occupied by elm, beech, maple, and other hardwoods. Its principal agricultural usage is for pasture, although for the most part the growth of native grasses is sparse. Little attempt has been made to remove the stony material and clear the land for cultivated crops. At present, owing to its position and early spring floodings, the best use of this gravelly soil is probably for permanent pasture and wood lots.

Typical Tioga silt loam occurs chiefly in narrow irregular bands bordering stream channels. Interwoven through such areas are narrow, tortuous courses of former streams, too narrow to be shown on the map, that ae below the general level and generally imperfectly drained. Such areas would be mapped as Middlebury silt loam if they were large enough to show on a map of the scale used.

The longer areas of typical Tioga silt loam are in the valley of Switz Kill. The soil occupies level first bottom positions, from 4

to 15 feet above the normal level of the stream. Infrequent overflows of short duration occur. Drainage is good, and excess water soon passes away. The soil has excellent moisture-holding capacity so that crops seldom suffer from lack of water in ordinary seasons.

This soil is of local importance, because it is the only level arable land available on some farms. Approximately 95 percent is cleared of timber and has been farmed for many years. The timber growth includes elm, hickory, birch, maple, willow, alder, beech, and quaking aspen (poplar).

Corn, oats, and hay lead in crop acreage. Wheat is sown infrequently. The crops grown are utilized in connection with the dairy farming that prevails on such land. The main hay crop of timothy yields 1 to 2½ tons an acre. Although the soil is slightly acid, good stands of clover frequently occur on the land. Small fields, usually of 3 to 5 acres, are sown to oats, which yield from 25 to 60 bushels, depending on seasonal factors. Yields of corn reach as high as 100 bushels an acre, though the average range is between 50 and 65 bushels. Practically all of the crops are consumed on the farm where grown. A large part of the land serves as pasture for dairy cattle. Little or no attempt is made to reseed pasture lands, but after several years some of these fields are put into a rotation. Fertilizers are not commonly used, or, when used with oats, applications are small.

**Tioga silt loam, high-bottom phase.**—The characteristics of the high-bottom phase are similar to those of typical Tioga silt loam. The surface soil is deep grayish-brown mellow friable silt loam, which grades into bright-brown friable silt loam, interbedded in places with bright-brown sandy layers from 4 to 6 inches thick. This soil occupies high benches or low-lying terraces along Schoharie Creek. It is rarely overflowed by high floods and is a well-drained, well-aerated soil. The greater part of it is utilized for the production of oats, hay, and corn. Yields are about equal to those obtained on the typical soil, but there is less danger of damage to crops by floods.

### IMPERFECTLY DRAINED ALLUVIAL SOILS

**Eel silt loam.**—Eel silt loam occupies imperfectly drained first bottoms along some of the streams issuing from areas where soil materials are calcareous or at least neutral in reaction. It is associated with the Genesee soils but generally lies somewhat lower. Most of the soil is in the town of Bethlehem.

The surface soil is grayish-brown or dark-brown silt loam, generally friable and granular, grading, at a depth of 8 or 9 inches, into brown or light-brown friable silt loam, which becomes less friable below a depth of 12 to 14 inches. Below this is light-brown firm silt loam or silty clay loam, becoming mottled with gray and rusty brown in the lower part. With increase in depth the color becomes lighter and the mottling more noticeable. In many places, at a depth ranging from 30 to 40 or more inches there are interbedded layers of mixed sand and gravel. Gravelly acid sandy modifications in the soil mass appear in some of the narrower strips. The surface soil may be slightly acid, but the heavier mottled subsoil is neutral or alkaline.

Probably 75 to 80 percent of this land is cleared for cultivation or for pasture. The larger part is used for pasture or for hay land.

Some of the broader and smoother areas are cultivated, and, in seasons that are not too wet, corn gives excellent yields. Kentucky bluegrass and bentgrass, with some timothy and white clover, comprise the important pasture plants.

**Middlebury silt loam.**—Middlebury silt loam is developed from materials similar to those of Tioga silt loam, but they have been subject to less thorough drainage, which has imparted a characteristic mottled condition to the subsoil. A representative vertical section exposes a surface soil of brownish-gray or grayish-brown mellow silt loam from 10 to 14 inches thick. Below this there is a rather abrupt change to a variable lighter colored layer displaying shades of dark gray, light gray, and dull brown in an irregularly mottled combination. In the slightly better drained positions the brown shades predominate over the gray, but the reverse is true in areas where the subsoil is subject to saturation for longer periods. The material is silty in texture and slightly compact in places. This mottled layer rests on a gravelly substratum at a depth ranging from 30 to 50 or more inches. Interspersed through the soil are a few lenses, pockets, or layers of heavier and lighter textured materials. As mapped, the soil also includes small intricately associated patches of Wayland silt loam and Tioga silt loam. Many of the areas mapped in northeastern Albany and eastern Schenectady Counties are more sandy in texture throughout, because they receive wash from the adjacent sandy soils.

A shallow variation of Middlebury silt loam along minor streams just north of Scotia consists of brown silty or loamy alluvium resting on bedrock of sandstone or shale at a depth of less than 30 inches. Areas of this soil are of minor agricultural importance. Some of them are used as pasture in connection with adjoining land or are allowed to remain under a timber cover, but more of them are cultivated.

The materials from which Middlebury silt loam has formed have been deposited in valley areas by stream action. The soil is well distributed along many streams of the area. These alluvial bottoms are narrow, their width ranging from about 50 to 300 feet. In a few places, however, as at the confluence of several streams or in old lake beds through which the streams flow, the belts are somewhat wider. Many of the wider areas are traversed by narrow winding channels of former streams, which are several feet below the general level.

During periods of heavy rainfall or in the spring, much of the land is subject to inundation, and low-lying areas sometimes remain wet for prolonged periods. The water table fluctuates with the seasons and varies with local conditions. The height to which the soil is affected by excessive moisture is related to the point where the mottled subsoil begins. Because of differences in drainage, depth, and texture of materials, the soil color and consistence vary within short distances. The relatively darker colored areas contain more organic matter than do the lighter colored areas.

The original timber growth has been removed from about 90 percent of the land, and a large part of the cleared land is utilized principally as pasture or meadow for dairy cattle. Some patches have been left idle for a few years and are encroached upon by a growth of scrub trees, brush, and weeds. The standing wood lots include alder, willow, hickory, elm, maple, and birch. Only a few of the broader areas are

cultivated for general farm crops such as corn, oats, or hay, but certain small selected patches are utilized the same way or for garden truck. The agricultural value of this soil for cultivated crops depends largely on local drainage conditions. Most of the areas occupy narrow belts in fairly deep trenched valleys having steep or broken valley walls where it is difficult to use heavy farm equipment. These narrow areas serve more conveniently for pasture. The pasture is composed mainly of natural herbage, and farmers seldom seed it. The principal value of the land under present agricultural practices is for pasture or timber.

#### POORLY DRAINED ALLUVIAL SOILS

**Wayland silt loam.**—A few small areas of Wayland silt loam are widely scattered over the central and northern parts of the area. Those near Meadowdale, south of Altamont, and near Glenville Center are representative.

The 10- to 12-inch surface soil ranges from a dark brownish-gray compact and moderately friable silt loam to light silty clay loam, generally mottled faintly in the lower part with rusty brown and gray. Below this is a dark-brown compact somewhat crumbly silty clay distinctly mottled dark gray and rusty brown, and from depths between about 24 and 40 inches the material is dark-gray less friable silty clay highly mottled with gray and rusty brown. Heavy mottled materials make up the substratum. When the soil dries out it cracks and when worked too wet it puddles and becomes cloddy. The surface soil ranges from slightly acid to slightly alkaline, whereas the subsoil layers are distinctly alkaline.

The low, flat areas of this soil are more or less subject to inundations from stream overflow. This hazard, together with the stiff soil material, limits the agricultural use. Much of the land remains in pasture or mowing. Better locations are fairly well suited for corn in drier years, as well as for other farm crops. Some of the most poorly drained areas approach a marshy condition.

### MISCELLANEOUS SOILS AND LAND TYPES

Included in the classification of miscellaneous soils and land types are alluvial soils, undifferentiated, peat, and muck, which are poorly drained and little used; rough stony land, which is suitable only for forestry; and made land, which is of doubtful value except for building sites.

**Alluvial soils, undifferentiated.**—Various alluvial soils on many narrow flood plains of the minor streams are designated as alluvial soils, undifferentiated, as they vary so widely in texture, color, and condition of drainage that they could not well be included with the definitely named alluvial soils. The designation includes small bodies (not mapped separately) of the Genesee, Tioga, Eel, and other soils. Much of this land is more or less timbered, whereas other parts are sufficiently cleared to be utilized conveniently for pasture. A few small patches have been used for tilled crops.

**Peat.**—As mapped in this area, peat consists of only partly decomposed vegetative matter derived from the remains of local trees and plants.

The 3- to 5-inch surface layer consists of loose litter of recently fallen leaves and twigs, together with the remains of dead undergrowth. Underneath this is dark-gray matted or fibrous only partly decomposed organic matter, from 2 to 4 inches thick. This rests on a 4- or 5-inch layer of dark brownish-gray or dark-gray smooth organic matter, most of which has been well decomposed and changed from its original form. Small plant roots thickly ramify the layer.

At a depth of about 9 to 12 inches is a mixture of brown raw fibrous partly decayed vegetable matter containing masses of thin layers of smooth material that has reached an advanced stage of decay. The water table stands near the surface throughout the greater part of the year.

Peat occurs in only a few places in the area. One of the largest bodies is around Featherstonhaugh Lake, another is about 1½ miles southeast of School No. 11 in Coeymans Town, and there are smaller scattered areas in other places. Several well-defined surface layers mark the larger areas of peat.

In some places an inner 10- or 20-foot strip borders an open body of water in which the vegetation is an open treeless growth composed principally of huckleberry, cranberry, sphagnum moss, reeds, rushes, cattail, ferns, and coarse bunchgrasses. In such strips the dead material is but little decomposed and still retains much of its original appearance. Most areas do not contain a body of water, and in such areas the material described as an inner strip forms the central part. On the outer edge of this material trees have encroached. Here, a somewhat lower water table has favored oxidation, and decay of the plant and tree litter has produced a thin layer of dark-gray partly or well decomposed organic matter. Underneath this, however, are saturated layers of raw fibrous material derived from vegetation similar to that now growing on the outer fringe of these areas. The tree growth is principally alder, willow, birch, and some tamarack. Farther back is a third belt in which the water table is still lower and the tree growth is heavier and includes soft maple, hemlock, pine, elm, quaking aspen (poplar), and other hardwoods. Such a belt represents transitional zones between peat and peaty muck or muck. The surface soil in this third belt is dark-gray organic matter, 10 to 18 inches thick, in an advanced stage of decomposition. derived largely from tree litter; but below this is raw organic matter derived from marsh plants.

Peat areas have no immediate agricultural value for cultivated crops, although they have a potential value for the culture of cranberries and huckleberries and for timber crops.

**Muck.**—Muck occurs in comparatively small bodies scattered over the area, mostly on the lowlands, where it occupies depressions once existing as ponds or small lakes. Representative areas are about one-half mile south of Meadowdale, 1½ miles southwest of Princetown, and 1½ miles west of Aquetuck. These deposits consist of brown or nearly black partly disintegrated organic matter derived largely from woody materials, together with some remains of grass and moss and various mineral soil materials. As developed in these counties, muck extends to a depth of 2 to 3 feet, where it rests on less decomposed

and more or less fibrous peat. In many places this peaty material reaches a depth of as much as 10 feet. Most areas have some growth of timber such as maple, ash, alder, willow, pine, canoe or white birch, and yellow birch, in addition to various reedy grasses. Some of the less heavily timbered areas are used for pasture. The deposits on the margins of some areas are shallow and overlie sandy clay or compact fine sandy loam. The area south of Meadowdale, so far as observed, rests on a deposit of marl.

**Muck, shallow phase.**—Muck, shallow phase, occurs in similar positions as typical muck but reaches a depth ranging from only a few inches to less than 3 feet, where it overlies sandy clay or whitish sand beds. Much of it contains a fairly large admixture of mineral matter. Only a few small areas are mapped, chiefly in eastern Schenectady County and northeastern Albany County.

**Rough stony land (Farmington soil material).**—This classification includes those areas of the Farmington soils that occupy steep hillsides or sharp escarpments and bluffs. They offer little or no practical opportunities for cultural operations. Narrow outcrops of limestone are exposed in some areas included within this classification. Practically all of the areas are forested.

These areas present a conspicuous feature of the landscape. For the most part, they represent the eastern fronts of high limestone ridges. In many places the hills stand from 50 to 150 feet above typical Farmington silt loam. In the vicinity of John Boyd Thacher Park a high perpendicular rock escarpment marks the outer edge of the limestone formation and the commencement of one part of Helderberg Hill. Rocks of the Devonian, Silurian, and Ordovician periods are exposed on the escarpment.

**Rough stony land (Lordstown soil material).**—Land included under this heading includes those areas of the Lordstown soils that are too rough, stony, or rocky to be of much agricultural value, such as gorgelike ravines, steep stony slopes, and flatter areas with a very thin soil covering and many rock outcrops. A few areas of deeper soil are covered with slabs and huge blocks of rock. The rocks are principally sandstone, and the more or less thin soil between them is acid in reaction. Most of the areas support a mixed timber growth, and the land type is best utilized for this purpose. Selected areas have some value for pasture. Areas designated as rough stony land (Lordstown soil material) occur in the eastern and southeastern parts of Albany County.

**Made land.**—Made land includes several areas that have had the surface radically altered, in most places by the filling in of marshes and depressions, as along the Hudson River where sand has been dredged from the river and pumped out over marshes and bottom lands. In other areas it consists of deposits of discarded building materials and stony refuse. Excavations for brickyards, as north of Coeymans, and rock quarries at South Bethlehem are included. Most of these areas have little or no agricultural value. Some locations, as in the city of Albany, provide building sites.

## PRODUCTIVITY RATINGS

In table 10, the soils of Albany and Schenectady Counties are listed alphabetically, and estimated average acre yields of the principal crops are given for each soil under the prevailing farming practices.

The estimates in table 10 are based primarily on interviews with farmers, the county agricultural agent, members of the State Experiment Station and College of Agriculture staffs, and others who have had experience in the agriculture of these counties. They are presented as estimates of the average production over a period of years according to the prevailing type of farming. It is realized that these estimates may not apply directly to specific tracts of land for any particular year, inasmuch as the soils as shown on the map vary somewhat, management practices differ slightly, and climatic conditions fluctuate from year to year. On the other hand, these estimates appear to be as accurate information as can be obtained without further detailed and lengthy investigations, and they serve to bring out the relative productivity of the soils shown on the map.

In order to compare directly the yields obtained in Albany and Schenectady Counties with those obtained in other parts of the country, yield figures have been converted in table 11 to indexes based on standard yields. The soils are listed in the approximate order of their general productivity under prevailing farming practices, the most productive at the head of the table.

The rating compares the productivity of each of the soils for each crop to a standard, namely, 100. This standard index represents the approximate average acre yield obtained without the use of amendments on the more extensive and better soil types of the regions of the United States in which the crop is most widely grown. An index of 50 indicates that the soil is about half as productive for the specified crop as is the soil with the standard index. The standard yield for each crop shown in table 11 is given at the head of each respective column. It is to be noted that the standards given here for sweet corn and tomatoes are local for these counties, and it is not to be expected that they will apply equally well in other parts of New York or elsewhere. Soils given amendments, such as lime and commercial fertilizers, or special practices, such as irrigation, and unusually productive soils of small extent, may have productivity indexes of more than 100 for some crops. Lack of sufficient and specific information have led to the use of descriptive terms for the pasture ratings in these counties.

The principal factors affecting the productivity of land are climate, soil (this includes the many physical, chemical, and biological characteristics), slope, drainage, and management, including the use of amendments. No one of these factors operates separately from the others, although some one may dominate. In fact, the factors listed may be grouped simply as the soil factor and the management factor, since slope, drainage, and most of the aspects of climate may be considered characteristics of a given soil type, because the soil type, as such, occupies specific geographical areas characterized by a given range of slope and climatic conditions. Crop yields over a long period furnish the best available summation of the associated factors and therefore they are used where available.

TABLE 10.—*Estimated average yields per acre under prevailing farming practices of the principal crops grown on the soils of Albany and Schenectady Counties, N. Y.*[1]

| Soil (soil types, phases, and land types) [2] | Corn (grain) | Corn (silage) | Wheat | Oats | Rye | Buckwheat | Timothy and clover | Clover | Alfalfa | Potatoes | Tomatoes | Sweet corn | Apples | Pasture [3] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Bushels* | *Tons* | *Bushels* | *Bushels* | *Bushels* | *Bushels* | *Tons* | *Tons* | *Tons* | *Bushels* | *Bushels* | *Bushels* | *Bushels* | |
| Albia silt loam | 30 | 6 | 20 | 35 | 25 | 25 | 1.5 | 1.0 | 1.0 | 125 | | | 125 | Fair. |
| Allis silt loam | 10 | 4 | 12 | 20 | 10 | 15 | .75 | | | | | | | Fair to poor. |
| Alluvial soils, undifferentiated | 25 | 6 | | 20 | | | 2.0 | 2.0 | | | | 25 | | Fair to good. |
| Angola silt loam | 25 | 6 | 18 | 30 | 15 | 25 | 1.5 | 1.0 | | 150 | | | | Poor to fair. |
| Boynton clay loam | 12 | 5 | 12 | 25 | 20 | 20 | 1.0 | 1.0 | | | | | | Fair. |
| Braceville silt loam | 12 | 5 | 12 | 25 | 20 | 20 | 1.0 | 1.0 | | 50 | | | | Do. |
| Canfield silt loam | 30 | 6 | 15 | 35 | 20 | 25 | 1.25 | 1.0 | 1.0 | 150 | | | 70 | Fair to good. |
| Chenango gravelly silt loam | 35 | 7 | 20 | 40 | 20 | 25 | 1.5 | 1.5 | 2.5 | 175 | 175 | 40 | 150 | Fair. |
| Chippewa silt loam | | | | 12 | | 10 | | | | | | | | Do. |
| Claverack fine sandy loam | 35 | 7 | 20 | 40 | 15 | 20 | 1.5 | 1.5 | 2.5 | 150 | | 40 | 150 | Good. |
| Claverack fine sandy loam, deep phase | 30 | 6 | 20 | 35 | 15 | 20 | 1.5 | 1.5 | 2.0 | 100 | 175 | 30 | | Fair to good. |
| Colonie gravelly sandy loam | 15 | 4 | 10 | 10 | 15 | | 1.0 | 1.0 | 1.5 | 75 | 180 | 25 | 100 | Poor. |
| Colonie loamy fine sand | 12 | 3 | | | 10 | | .5 | .5 | 1.0 | 75 | 100 | 20 | 75 | Very poor. |
| Colonie loamy fine sand, broken phase | | | | | | | | | | | | | | Do. |
| Colonie fine sand, rolling phase | | | | | 5 | | | | | | | | | Do. |
| Copake loam | 40 | 8 | 20 | 35 | 20 | 20 | 1.5 | 1.5 | 2.0 | 100 | 150 | 30 | | Fair to good. |
| Copake cobbly loam | 35 | 7 | 20 | 30 | 20 | 20 | 1.0 | 1.0 | 2.0 | 100 | 150 | 30 | | Fair. |
| Copake very fine sandy loam | 40 | 8 | 20 | 35 | 20 | 20 | 1.5 | 1.5 | 2.0 | 150 | 180 | 30 | | Do. |
| Copake fine sandy loam | 35 | 7 | 15 | 35 | 20 | 15 | 1.0 | | 2.0 | 150 | 180 | 30 | | Do. |
| Copake cobbly sandy loam | 25 | 5 | 10 | 20 | 15 | 10 | .5 | .5 | 1.5 | 75 | 100 | 15 | | Fair to poor. |
| Cossayuna silt loam | 35 | 7 | 15 | 35 | 20 | 20 | 1.5 | 1.5 | 2.0 | 150 | 150 | 60 | 100 | Good. |
| Cossayuna silt loam, shallow phase | 20 | 5 | 15 | 30 | 20 | 25 | 1.0 | 1.0 | 2.5 | 150 | | | | Poor. |
| Culvers silt loam | 20 | 5 | 10 | 30 | 20 | 20 | .8 | 1.0 | .5 | 150 | | | 100 | Fair. |
| Culvers silt loam, steep phase | 15 | 5 | | 25 | 10 | 10 | 1.0 | 1.0 | | | | | 75 | Fair to poor. |
| Eel silt loam | 40 | 9 | | 30 | | | 1.5 | 1.0 | | | | 35 | | Good. |
| Erie silt loam | 25 | 6 | 10 | 30 | 15 | 15 | 1.5 | 1.0 | .5 | 75 | | | | Do. |
| Farmington silt loam | 25 | 6 | 12 | 25 | 15 | 20 | 1.0 | 1.0 | 1.0 | 100 | | | | Fair to good. |
| Genesee fine sandy loam | 55 | 12 | 15 | 35 | 15 | 20 | 2.0 | 2.0 | 2.5 | 150 | | 50 | | Good. |
| Genesee silt loam | 55 | 12 | 15 | 40 | 20 | 20 | 2.0 | 2.0 | 2.5 | 125 | | 50 | | Do. |
| Genesee silt loam, high-bottom phase | 55 | 12 | 20 | 45 | 25 | 20 | 2.0 | 2.0 | 3.0 | 200 | 200 | 60 | | Do. |
| Granby loamy fine sand | 30 | 7 | | 30 | | | 1.5 | | | | | | | Fair. |
| Hoosic loamy coarse sand | 12 | 4 | | 12 | 15 | 15 | 1.0 | 1.0 | 1.0 | 100 | 150 | 20 | | Poor. |
| Hornell silty clay loam | 15 | 5 | 15 | 25 | 20 | 20 | 1.0 | 1.0 | | 70 | | | | Do. |
| Hudson silt loam | 40 | 8 | 20 | 35 | 20 | 20 | 2.0 | 2.0 | 3.0 | 75 | | 40 | 125 | Good. |
| Hudson silt loam, broken phase | | | | | | | 1.0 | 1.0 | 2.0 | | | | | Fair to good. |
| Hudson silty clay loam | 30 | 7 | 20 | 40 | 20 | 15 | 2.0 | 2.5 | 3.0 | 40 | | 40 | | Do. |
| Hudson clay | 25 | 5 | 15 | 25 | | | 1.5 | 1.5 | | | | | | Do. |
| Lackawanna silt loam | 20 | 5 | 10 | 30 | 15 | 20 | 1.0 | 1.0 | .5 | 175 | | | 60 | Fair to good. |
| Lackawanna stony silt loam, steep phase | | | | | | | | | | | | | | Poor. |
| Langford gravelly silt loam | 30 | 6 | 15 | 35 | 20 | 25 | 1.5 | 1.5 | 1.5 | 150 | | | 125 | Good. |
| Langford gravelly silt loam, steep phase | 20 | 5 | | 25 | 10 | 10 | 1.0 | 1.0 | | 75 | | | 100 | Poor to fair. |
| Livingston silt loam | | 3 | | 18 | | 15 | 1.5 | | | | | | | Fair. |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Livingston silty clay loam | | 2 | | 18 | | | 1.0 | | | | | | | Do. |
| Lordstown silt loam | 20 | 5 | 12 | 30 | 15 | 20 | 1.0 | 1.0 | .5 | 175 | | | 60 | Poor to fair. |
| Lordstown silt loam, steep phase | | | | | | | | | | | | | | Poor. |
| Lyons silt loam | 25 | 6 | | 20 | | 15 | 1.5 | 1.5 | | | | | | Good. |
| Made land | | | | | | | | | | | | | | Poor. |
| Manlius shaly silt loam | 15 | 4 | 12 | 20 | 15 | 20 | 1.0 | 1.0 | | 75 | | 20 | 75 | Do. |
| Mansfield silt loam | | | | 20 | 10 | 15 | 1.0 | .75 | | | | | | Fair. |
| Middlebury silt loam | 35 | 8 | | 30 | | | 1.5 | 1.0 | | | | 35 | | Good. |
| Muck | 40 | 9 | | | | | | | | | | 40 | | Fair. |
| Muck, shallow phase | 40 | 9 | | | | | | | | | | 40 | | Do. |
| Nassau shaly silt loam | 20 | 5 | 12 | 20 | 10 | | 1.0 | 1.0 | | 75 | | 20 | 75 | Poor. |
| Norwich silt loam | | | | 15 | | 10 | | | | | | | | Fair. |
| Orono silt loam | 20 | 5 | 15 | 25 | 15 | | 1.0 | 1.0 | 1.5 | 50 | | | | Fair to good. |
| Orono silty clay loam | 20 | 5 | 10 | 25 | 15 | | 1.0 | 1.0 | 1.5 | | | | | Good. |
| Peat | | | | | | | | | | | | | | Poor to fair. |
| Pittsfield silt loam | 55 | 12 | 25 | 50 | 20 | 25 | 2.0 | 2.0 | .3 | 175 | | 70 | 150 | Good. |
| Poland silt loam | 55 | 12 | 25 | 50 | 20 | 25 | 2.0 | 2.0 | 2.5 | 175 | | 70 | 150 | Do. |
| Poland silt loam, steep phase | 20 | 5 | 10 | 30 | 15 | 15 | 1.5 | 1.5 | 2.0 | 100 | | 30 | 100 | Do. |
| Rough stony land (Farmington soil material) | | | | | | | | | | | | | | Poor. |
| Rough stony land (Lordstown soil material) | | | | | | | 1.0 | 1.0 | | | | | | Do. |
| Schodack gravelly loam | | | | 15 | 10 | | 1.0 | 1.0 | 2.0 | 75 | 100 | 25 | | Poor to fair. |
| Schoharie silt loam | 25 | 7 | 20 | 35 | 20 | 20 | 2.0 | 2.0 | 2.0 | 75 | | | 30 | Good. |
| Tioga silt loam | 55 | 12 | 15 | 40 | 20 | 20 | 2.0 | 2.0 | 2.0 | 125 | | 60 | | Do. |
| Tioga silt loam, high-bottom phase | 55 | 12 | 20 | 45 | 20 | 20 | 2.0 | 2.0 | 2.5 | 150 | | 60 | | Do. |
| Volusia silty clay loam | 20 | 5 | 10 | 30 | 15 | 15 | 1.0 | 1.0 | | 75 | | | | Fair. |
| Wauseon fine sandy loam | 30 | 7 | | 25 | | | 1.5 | | | | | | | Do. |
| Wayland silt loam | | 5 | | 25 | | 15 | 1.0 | 1.0 | | | | | | Fair to good. |
| Wooster silt loam | 40 | 8 | 20 | 45 | 20 | 25 | 1.5 | 1.5 | 1.5 | 200 | | | 150 | Do. |

[1] Estimates are based on information obtained from farmers during the progress of the soil survey.

[2] The soils are listed in alphabetical order.

[3] Productivity for pasture is given only in general descriptive terms.

300781—42——5

TABLE 11.—*Productivity ratings of the soils of Albany and Schenectady Counties, N. Y., under prevailing practices*

| Soil (soil types, phases, and land types) [1] | Crop productivity index [2] for— | | | | | | | | | | | | | | General productivity grade [6] | Soil grouping as on legend of map |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corn (grain) 100=50 bu. | Corn (silage) 100=12 T. | Wheat 100=25 bu. | Oats 100=50 bu. | Rye 100=25 bu. | Buckwheat 100=25 bu. | Timothy and clover hay 100=2 T. | Red clover hay 100=2 T. | Alfalfa hay 100=4 T. | Potatoes 100=200 bu. | Tomatoes [3] 100=200 bu. | Sweet corn [3] 100=70 bu. | Apples 100=200 bu. | Pasture [4] | | |
| Pittsfield silt loam | 110 | 100 | 100 | 100 | 80 | 100 | 100 | 100 | 75 | 85 | ------ | 100 | 75 | Good | 1 | First grade soils (good to excellent cropland). High inherent fertility, favorable topography, comparatively free of stone and easily managed. |
| Poland silt loam | 110 | 100 | 100 | 100 | 80 | 100 | 100 | 100 | 60 | 85 | ------ | 100 | 75 | do | 1 | |
| Genesee silt loam, high-bottom phase | 110 | 100 | 80 | 90 | 100 | 80 | 100 | 100 | 75 | 100 | 100 | 85 | ------ | do | 1 | |
| Tioga silt loam, high-bottom phase | 110 | 100 | 80 | 90 | 80 | 80 | 100 | 100 | 60 | 75 | ------ | 85 | ------ | do | 1 | |
| Genesee silt loam | 110 | 100 | 60 | 80 | 80 | 80 | 100 | 100 | 60 | 60 | ------ | 70 | ------ | do | 1 | |
| Tioga silt loam | 110 | 100 | 60 | 80 | 80 | 80 | 100 | 100 | 50 | 50 | ------ | 85 | ------ | do | 1 | |
| Genesee fine sandy loam | 110 | 100 | 60 | 70 | 60 | 80 | 100 | 100 | 60 | 75 | ------ | 70 | ------ | do | 2 | |
| Hudson silt loam | 80 | 70 | 80 | 70 | 80 | 80 | 100 | 100 | 75 | 40 | ------ | 55 | 60 | do | 2 | |
| Copake very fine sandy loam | 80 | 70 | 80 | 70 | 80 | 80 | 75 | 75 | 50 | 75 | 90 | 40 | ------ | Fair | 3 | Second grade soils (fair to good cropland). One or more of the favorable characteristics (of fertility, productivity, topography, absence of stone, etc.) are less strongly developed. |
| Copake loam | 80 | 70 | 80 | 70 | 80 | 80 | 75 | 75 | 50 | 50 | 75 | 40 | ------ | Fair to good | 3 | |
| Hudson silty clay loam | 60 | 60 | 80 | 80 | 80 | 60 | 100 | 100 | 75 | 20 | ------ | 55 | ------ | Good | 3 | |
| Chenango gravelly silt loam | 70 | 60 | 80 | 80 | 80 | 100 | 75 | 75 | 60 | 85 | 85 | 55 | 75 | Fair | 3 | |
| Wooster silt loam | 80 | 65 | 80 | 90 | 80 | 100 | 75 | 75 | 35 | 100 | ------ | ------ | 75 | Fair to good | 3 | |
| Claverack fine sandy loam | 70 | 60 | 80 | 80 | 60 | 80 | 75 | 75 | 60 | 75 | ------ | 70 | ------ | Good | 3 | |
| Cossayuna silt loam | 70 | 60 | 60 | 70 | 80 | 80 | 75 | 75 | 50 | 75 | 75 | 85 | 50 | do | 3 | |
| Claverack fine sandy loam, deep phase | 60 | 50 | 80 | 70 | 60 | 80 | 75 | 75 | 50 | 50 | 85 | 40 | ------ | Fair to good | 4 | |
| Copake fine sandy loam | 70 | 60 | 60 | 70 | 80 | 60 | 50 | 50 | 50 | 75 | 90 | 40 | ------ | Fair | 4 | |
| Schoharie silt loam | 60 | 50 | 80 | 70 | 80 | 100 | 100 | 100 | 25 | 35 | ------ | ------ | 15 | Good | 4 | |
| Albia silt loam | 60 | 50 | 80 | 70 | 100 | 100 | 75 | 50 | 25 | 60 | ------ | ------ | 60 | Fair | 4 | Third grade soils (fair cropland). The desirability of these soils for cropping purposes is definitely less than in the above groups. Stoniness, rolling topography, imperfect drainage, low inherent fertility, droughtiness, or shallowness to rock are examples of the limiting factors. |
| Langford gravelly silt loam | 60 | 50 | 60 | 70 | 80 | 100 | 75 | 75 | 35 | 75 | ------ | ------ | 60 | Good | 4 | |
| Canfield silt loam | 60 | 50 | 60 | 70 | 80 | 100 | 65 | 50 | 25 | 75 | ------ | ------ | 35 | Fair to good | 4 | |
| Copake cobbly loam | 70 | 60 | 80 | 60 | 80 | 80 | 50 | 50 | 50 | 50 | 75 | 40 | ------ | Fair | 4 | |
| Angola silt loam | 50 | 50 | 70 | 60 | 60 | 100 | 75 | 50 | ------ | 75 | ------ | ------ | ------ | Poor to fair | 5 | |
| Cossayuna silt loam, shallow phase | 40 | 40 | 60 | 60 | 80 | 100 | 50 | 50 | 60 | 75 | ------ | ------ | ------ | Poor | 5 | |
| Farmington silt loam | 50 | 50 | 50 | 50 | 60 | 80 | 50 | 50 | 25 | 50 | ------ | ------ | ------ | Fair to good | 5 | |
| Hudson clay | 50 | 40 | 60 | 50 | ------ | ------ | 75 | 75 | ------ | ------ | ------ | ------ | ------ | Good | 5 | |
| Lackawanna silt loam | 40 | 40 | 40 | 60 | 60 | 80 | 50 | 50 | 15 | 85 | ------ | ------ | 30 | Fair to good | 5 | |
| Lordstown silt loam | 40 | 40 | 50 | 60 | 60 | 80 | 50 | 50 | 15 | 85 | ------ | ------ | 30 | do | 5 | |
| Culvers silt loam | 40 | 40 | 60 | 60 | 80 | 80 | 40 | 50 | 15 | 75 | ------ | ------ | 50 | Fair | 5 | |
| Orono silt loam | 40 | 40 | 60 | 50 | 60 | ------ | 50 | 50 | 35 | 25 | ------ | ------ | ------ | Fair to good | 6 | |
| Orono silty clay loam | 40 | 40 | 40 | 50 | 60 | ------ | 50 | 50 | 35 | ------ | ------ | ------ | ------ | do | 6 | |
| Copake cobbly sandy loam | 50 | 40 | 40 | 40 | 60 | 40 | 25 | 25 | 40 | 35 | 50 | 20 | ------ | Fair to poor | 6 | |
| Colonie gravelly sandy loam | 30 | 30 | 40 | 20 | 60 | ------ | 50 | 50 | 35 | 35 | 90 | 35 | 50 | Poor | 6 | |
| Hoosic loamy coarse sand | 25 | 35 | ------ | 25 | 60 | 60 | 50 | 50 | 25 | 50 | 75 | 30 | ------ | do | 6 | |
| Colonie loamy fine sand | 25 | 25 | ------ | ------ | 40 | ------ | 25 | 25 | 25 | 40 | 50 | 30 | 35 | Very poor | 6 | |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Eel silt loam [6] | 80 | 75 | | 60 | | | 75 | 50 | | | | 50 | | Good | 5 | Fourth-grade soils (fair to poor cropland or pasture land). Poor drainage or shallowness are the chief characteristics that restrict the uses of most of these soils. |
| Middlebury silt loam [6] | 70 | 70 | | 60 | | | 75 | 50 | | | | 50 | | do | 5 | |
| Granby loamy fine sand [6] | 60 | 60 | | 60 | | | 75 | | | | | | | Fair | 5 | |
| Wauseon fine sandy loam [6] | 60 | 60 | | 50 | | | 75 | | | | | | | do | 5 | |
| Lyons silt loam [6] | 50 | 50 | | 40 | | 60 | 75 | 75 | | | | | | Good | 6 | |
| Erie silt loam | 50 | 50 | 40 | 60 | 60 | 60 | 75 | 50 | 15 | 35 | | | | Good | 6 | |
| Volusia silty clay loam | 40 | 40 | 40 | 60 | 60 | 60 | 50 | 50 | | 35 | | | | Fair | 6 | |
| Nassau shaly silt loam | 40 | 40 | 50 | 40 | 40 | | 50 | 50 | | 35 | | 30 | 35 | Poor | 6 | |
| Hornell silty clay loam | 30 | 40 | 60 | 50 | 80 | 80 | 50 | 50 | | 35 | | | | do | 7 | |
| Boynton clay loam | 25 | 40 | 50 | 50 | 80 | 80 | 50 | 50 | | | | | | Fair | 7 | |
| Manlius shaly silt loam | 30 | 35 | 50 | 40 | 60 | 80 | 50 | 50 | | 35 | | 30 | 35 | Poor | 7 | |
| Braceville silt loam | 25 | 40 | 50 | 50 | 80 | 80 | 50 | 50 | | 25 | | | | Fair | 7 | |
| Alluvial soils, undifferentiated [6] | | 50 | | 40 | | | 100 | 100 | | | | 50 | | Fair to good | 6 | |
| Poland silt loam, steep phase | 40 | 40 | 40 | 60 | 60 | 60 | 75 | 75 | 50 | 50 | | 40 | 50 | Good | 7 | |
| Langford gravelly silt loam, steep phase | 40 | 40 | | 50 | 40 | 40 | 50 | 50 | | 35 | | | 50 | Poor to fair | 7 | |
| Culvers silt loam, steep phase | 30 | 40 | | 50 | 40 | 40 | 50 | 50 | | | | | 35 | Fair to poor | 7 | |
| Allis silt loam [6] | 20 | 30 | 50 | 40 | 40 | 60 | 35 | | | | | | | do | 8 | |
| Muck [6] | 80 | 75 | | | | | | | | | | 60 | | Fair | 8 | |
| Muck, shallow phase [6] | 80 | 75 | | | | | | | | | | 60 | | do | 8 | Fifth-grade soils (pasture and forest lands very low value for cropping). |
| Wayland silt loam [6] | | 40 | | 50 | | 60 | 50 | 50 | | | | | | Fair to good | 8 | |
| Livingston silt loam | | 25 | | 35 | | 60 | 75 | | | | | | | Fair | 8 | |
| Livingston silty clay loam | | 20 | | 35 | | | 50 | | | | | | | do | 9 | |
| Schodack gravelly loam | | | | 30 | 40 | | 50 | 50 | 50 | 35 | 50 | 35 | 75 | Poor to fair | 9 | Steepness of slope or poor drainage are the chief characteristics that restrict the uses of most of these soils. |
| Mansfield silt loam | | | | 40 | 40 | 60 | 50 | 35 | | | | | | Fair | 9 | |
| Hudson silt loam, broken phase | | | | | | | 50 | 50 | 50 | | | | | Fair to good | 9 | |
| Norwich silt loam | | | | 30 | | 40 | | | | | | | | Fair | 9 | |
| Chippewa silt loam | | | | 25 | | 40 | | | | | | | | do | 9 | |
| Colonie fine sand, rolling phase | | | | | 20 | | | | | | | | | Very poor | 10 | |
| Peat | | | | | | | | | | | | | | Poor to fair | 10 | |
| Lordstown silt loam, steep phase | | | | | | | | | | | | | | Poor | 10 | |
| Lackawanna stony silt loam, steep phase | | | | | | | | | | | | | | do | 10 | |
| Colonie loamy fine sand, broken phase | | | | | | | | | | | | | | Very poor | 10 | |
| Rough stony land (Farmington soil material) | | | | | | | | | | | | | | Poor | 10 | Miscellaneous. Chiefly limited to use as forest land. |
| Rough stony land (Lordstown soil material) | | | | | | | | | | | | | | do | 10 | |
| Made land | | | | | | | | | | | | | | do | 10 | |

[1] The soils are listed in the approximate order of their general productivity under the prevailing practices of soil management, the most productive first.

[2] The soils are given indexes that indicate the approximate average production of each crop in percentage of the standard of reference. The standard represents the approximate average yield obtained without the use of amendments on the more extensive and better soil types of those regions in the United States in which the crop is most widely grown. The indexes are based on estimates of yields (see table 10), as yield data are too fragmentary to be adequate.

[3] The indexes for tomatoes and sweet corn refer only to local standards used in this table for Albany and Schenectady Counties.

[4] Productivity for pasture is given only in general descriptive terms.

[5] These numbers indicate the general productivity of the soils for the common crops. Refer to the text for further explanation.

[6] The indexes apply to the naturally better drained sites or to those areas receiving some benefits of artificial drainage. They do not apply strictly to either the more poorly drained or the best drained sites.

General productivity grade numbers are assigned in the column "General productivity grade." This grade is based on a weighted average of the indexes for the various crops, the weighting depending on the relative acreage and value of the crops. If the weighted average is between 90 and 100 the soil type is given a grade of 1; if it is between 80 and 90 a grade of 2 is given, and so on.[7] Since it is difficult to measure mathematically either the exact significance of a crop in the agriculture of an area or the importance or suitability of certain soils for particular crops, perhaps too much significance may be given to the order in which the soils are listed. On the other hand, the arrangement does give information as to the general productivity.

The right-hand column of table 11 gives the grouping of the soils as they appear on the legend for the map. In addition, a few statements are made as to the general characteristics of the soils of each group. The grouping of soils as to general desirability for cropping purposes, it will be noted, does not everywhere coincide with the general productivity grade number. This is to be expected, inasmuch as other characteristics in addition to productivity influence the general desirability of soils in respect to their use for crops. For example, slight differences in productivity may be overshadowed by differences in workability or the maintenance of productivity and the prevention of erosion.

Productivity tables do not present the relative roles that soil types, because of their extent and the pattern of their distribution, play in the agriculture of the county. The tables show the relative productivity of individual soils. They cannot picture in a given county the total quantitative production of crops by soil areas without the additional knowledge of the acreage of the individual soil types devoted to each of the specified crops.

Economic considerations have played no part in determining the crop productivity indexes. They cannot be interpreted, therefore, into land values except in a very general way. Distance to market, relative prices of farm products, and other factors influence the value of land. It is important to realize that productivity, as measured by yields, is not the only consideration that determines the relative worth of a soil for growing crops. The ease or difficulty of tillage, and the ease or difficulty with which productivity is maintained, are examples of considerations other than productivity that influence the general desirability of a soil for agricultural use. In turn, steepness of slope. the presence or absence of stone, the resistance to tillage offered by the soil because of its consistence or structure, and the size and shape of areas are characteristics of soils that influence the relative ease with which they can be tilled. Likewise, inherent fertility and susceptibility to erosion are characteristics that influence the ease of maintaining soil productivity at a given level. Productivity, as measured by yields, is influenced to some degree by all these and other factors, such as moisture-holding capacity of the soil and its permeability to roots and water; and so they are not factors to be considered entirely separately from productivity; but, on the other hand, schemes

[7] Instead of following the usual procedure for weighting the indexes of the individual crops, the general productivity grade numbers in table 11 have been assigned from visual inspection of the indexes, and no mathematical calculations have been used. The placing of the soils results, therefore, largely from an approximation of the average of the indexes, especially those for hay, oats, and corn silage.

of land classification to designate the relative suitability of land for agricultural use must give some separate recognition to them.

## AGRICULTURAL METHODS AND SOIL MANAGEMENT

The dominant type of farming in this region is dairying for the production of milk to be sold as fluid milk on the market. Most crops produced on these farms provide subsistence for dairy cattle and work animals. Farm practices agree generally with those in other dairy sections of the State. Many dairy farms combine in varying degrees the production of truck crops, fruit, and poultry. A few farms in the Hudson Valley, where climate and soil are favorable, are devoted chiefly to the culture of fruit. Likewise, many farms, especially those adjacent to the populous centers, are devoted more or less exclusively to the production of truck crops. On the Appalachian Plateaus also the farms are of dairy and livestock types, but their efficiency generally varies with the kind of soil. Most of the more prosperous farms are on such soils as the Pittsfield, Langford, and better drained soils of the bottom lands, and the less prosperous ones are on the thinner and more rugged Lordstown, Lackawanna, Culvers, and associated soils. In this section, too, are larger wooded tracts, although among the farms having better soils there are wood lots on practically every farm.

Crop rotations vary somewhat, but the prevailing rotation followed on dairy farms is (1) corn, (2) oats, and (3) timothy, then clover for 3 to 5 years. When the land is not intensively cultivated, grassland may be mowed as long as acceptable stands last, or it may be used for pasture. Sometimes wheat follows oats, thus lengthening the rotation. Wheat is often grown on the heavier clayey soils. On some of the sandier soils of the lowlands rye may be substituted for oats, as rye grows better than oats on these soils. Systematic rotations are not so common on the stream bottoms.

Alfalfa does not fit regularly into definite rotations. Where a successful stand is obtained, this crop is continued as long as the stand lasts. The better stands are on soils having alkaline or limy substrata, such as the Pittsfield or the deeper phases of the Farmington soils.

The younger and better producing orchards are cultivated, although some of the older orchards give fair returns without special cultivation. Orchards are cultivated early in the season and are usually planted to a cover crop. Trees are well fertilized and sprayed at proper intervals.

Although erosion on the soils of Albany and Schenectady Counties is not so serious as in some other areas, considerable washing and sheet erosion occur on cultivated slopes. In some places slight gullying causes serious concern. These conditions may be observed on some of the wider slopes with intertilled and often with some close-growing crops, such as oats and buckwheat. Many farmers recognize these tendencies and practice strip cultivation. At the time of the survey (1936) practical cooperative demonstrations in cropping systems to control erosion were being carried out in western Albany County under the supervision of specialists from the headquarters of the Civilian Conservation Corps at Gallupville.

Much of the farm land receives too little manure for best crop results, because too little is produced. In a few instances certain fields have

been manured too heavily. Conclusions of the Cornell University Agricultural Experiment Station indicate that applications of manure in excess of 10 loads an acre are of doubtful value (*7*). Generally the use of phosphates with manure gives better results than the use of complete fertilizers. This is believed to be true of those soils derived from glacial till, especially if suitable lime is applied; but results may be expected to vary with the kind of soil and the quantities and manner of fertilizer applications.

As to the use of potash fertilizer, the Cornell Station concludes (*6*) that such soils as the Pittsfield and Farmington silt loams respond moderately well to the use of potassium but respond more satisfactorily to the use of lime in conjunction with nitrogen and phosphate fertilizers. The use of lime alone showed no benefit. The Volusia and Erie soils in some instances would benefit from potash applications, and this should be true also for the Albia soils; but the inference is that the use of lime, and manures with phosphate, would meet the usual requirements. The heavier Hudson and Orono soils evidently need little or no potassium. The more open leachy sandy soils, such as the Copake, Hoosic, and Colonie soils, require liberal applications of nitrogen, phosphorus, and potash for satisfactory crop growth.

Light-colored soils generally are deficient in humus, which ordinarily means a low nitrogen content. In fact, most of the soils developed from glacial till are benefited from the addition of nitrogen by the growing of leguminous crops or the addition of manures or commercial fertilizers. Likewise, most soils respond readily to applications of phosphorus, and this response is more noticeable in the soils of alkaline parent materials, such as the Pittsfield and Farmington and possibly the Erie soils.

The Cornell Station (*2*) recommends for the Lordstown, Volusia, and Wooster soils a 10-year rotation that is believed suited for most of the acid soils of the area.

For soils of highly alkaline parent materials, such as the Pittsfield soils, the following rotation is recommended: (1) Corn, (2) potatoes, (3) oats or wheat, and (4) clover and timothy or alfalfa.

For soils of moderately alkaline parent materials, such as the Cossayuna, Albia, and Boynton, the following rotations are suggested: (1) Buckwheat, (2) oats, (3) clover, and (4) timothy; or (1) buckwheat, (2) corn, potatoes, or cabbage, (3) oats, (4) clover, and (5) timothy; or (1) corn, potatoes, or cabbage, (2) buckwheat, (3) oats, (4) clover, and (5) timothy.

Most of the corn is grown for silage, although in places some is grown for grain, and considerable sweet corn is grown in market gardens. Most of the manure is applied when the land is plowed for corn, which usually begins the crop rotation. The fertilization is improved by the addition (preferably with the manure) of superphosphate, at the rate of 300 to 400 pounds to the acre. If the supply of manure is small, the station suggests the use of a like quantity of ammoniated superphosphate or suitable quantities of 4–16–4 or 4–12–4 fertilizer. The same authority recommends the Sweepstakes and Oswego Ensilage corn varieties for lower elevations, and on higher elevations Cornell 11 or some of the larger flint varieties for husking. Other suggested varieties are Angel of Midnight and King Philip flint. Suggested sweet corn varieties are Early Evergreen, Hickox,

and Bantam Evergreen. Heavier fertilizer applications are likely to prove profitable for sweet corn.

Oats provide feed for work animals, and during the growing period this crop can be used as a nurse crop for clover and timothy. On productive soils that have been well fertilized for corn, the rate of seeding should be moderate, and the use of phosphorus to balance a large nitrogen supply and lessen the tendency of the crop to lodge is advisable (*3*).

On many soils of the area poor success with red clover is due to lack of lime, or to poor soil drainage, or both. Red clover should be planted on the better drained soils, and alsike clover should be substituted where the soils are not so well drained. On less well drained soils redtop is preferred to timothy. On such acid soils as the Volusia, Erie, and Wooster soils, mammoth clover may be planted, as it has a lower lime requirement than red clover. If clover is seeded with timothy the quality of the hay is improved, and the timothy produces better yields and better quality of hay for 1, 2, or even 3 years after the clover has disappeared. Clover also helps the timothy to resist encroachment of weeds (*3*).

Buckwheat is not an important crop but is grown in many parts of the area, especially in the vicinity of Knox. This quick-maturing crop fits into many situations, as on wet land where other early planted crops have failed or where a wet season has discouraged planting an early crop. Buckwheat on productive land may yield satisfactorily without special fertilization, but on most land better fruiting results if 150 to 200 pounds of superphosphate an acre is applied (*3*). Good yields may be expected on the Pittsfield, Erie, and similar soils. Buckwheat is a convenient crop on the Lordstown, Canfield, and Volusia soils.

Potatoes are not important within this area. They are grown more generally for home use and to only a slight extent for sale, although many market gardeners include them in their cropping. Most well-drained productive acid soils are suited for potatoes. Such soils as the Lordstown, Wooster, Canfield, and Langford generally are satisfactory. Other suitable soils for potatoes are the Albia, Hoosic, and Claverack.

Potatoes grow with better success with the use of commercial fertilizers, as manure seems to favor development of infections. The use of manure is to be preferred with a preceding crop. When careful attention is given for intensive production, the Cornell University Agricultural Experiment Station recommends the application of 600 to 1,000 pounds, or perhaps more, to the acre, of a 5–10–5 fertilizer. These higher applications will usually benefit the succeeding crops in the rotation. Soils should not be limed when planted to potatoes, because lime encourages potato scab (*3*). Green Mountain and Irish Cobbler varieties are grown, and these seem adapted to most of the lighter soils of the lowlands. White Rural and Russet Rural varieties should be better adapted to the heavier soils, such as the Albia, Canfield, and Langford silt loams.

As indicated before, the light-textured soils used in market gardening require liberal fertilization for best production. Fertilizers, of a 5–10–5 analysis are used largely. Some growers use fertilizers analyzing 4–8–4 and 10–20–10. The 10–20–10 fertilizer has twice the

fertilizing value of the 5–10–5 for a given weight of material. The use of the more concentrated form is more economical, as freight and handling costs are cut in half.

Pastures too often receive but little attention. On the Appalachian Plateaus large areas of undesirable cropland are available for pasture, and because of their extent little care is exercised in their maintenance and improvement. Many pasture areas have had their desirable grasses displaced by various weedy growths, such as briers, hardhack, sumac, cinquefoil, and such trees as quaking aspen (poplar), birch, seedling apple, and hawthorn.

Of the desirable pasture grasses growing in the area, bluegrass leads and is especially abundant on such soils as the Hudson, Genesee, and Pittsfield. Rhode Island bentgrass seems suitable for the heavier acid soils, such as the Canfield, Volusia, Lordstown, Culvers, and others. White clover grows well in less well drained areas of these soils. The less productive soils do not favor the retention of the desirable grasses, and much poverty oatgrass, aster, goldenrod, devil's-paintbrush, cinquefoil, and other weeds get a foothold. On the various bottom soils, such as Tioga, Middlebury, and Eel, creeping bentgrass, bluegrass, and white clover provide good grazing. The lowland sandy soils, such as the Copake, Hoosic, and Colonie, are not natural grassland, and satisfactory grazing is hard to establish.

The Cornell University Agricultural Experiment Station regards the addition of phosphate fertilizer, such as superphosphate, basic slag, bonemeal, or rock phosphate, as basic to pasture improvement. Applications of 500 to 800 pounds an acre of superphosphate in the fall is effective where native legumes, for instance white clover, grow. The clover growth is encouraged, and with its spread the palatability of the herbage is enhanced, and the closer grazing encourages a more compact sward. On land devoid of legumes, the addition of lime with some nitrogen carrier may be needed in connection with phosphatic treatment. In general, the Cornell Station recommends the improvement of pastures by fertilization in preference to plowing and reseeding. This would be especially desirable on the steeper slopes and on areas too rough or stony for easy plowing. The use of flexible or light harrows in the fall or winter is advised to improve grassland by spreading droppings, uprooting rejected herbage, loosening mats of partly decayed organic matter, and agitating the soil surface.

## MORPHOLOGY AND GENESIS OF SOILS

Albany and Schenectady Counties lie chiefly within the region of Gray-Brown Podzolic soils (*8*). The soils have developed, therefore, under forested conditions in a humid climate. This accounts for the light color of most of the well-drained soils as a result of leaching, which process through many centuries has also removed from the upper soil layers most of the lime that may have been present originally. True Podzols are rare, and examples of them occur only on some of the upland slopes. Enough forest debris, however, has accumulated in the original forests to give minor and varying darker coloring to most of the surface soils. Brown Podzolic soils are common on the Appalachian Plateaus.

All this region has been glaciated. The moving ice has filled many low positions with deep glacial till, and it has scoured the higher

exposed positions, leaving only a thin mantle of soil-forming material. The soil materials, therefore, range in thickness from a mere film to deposits 100 or more feet thick. Many of the areas of thinner soil have been feebly glaciated, and the soils are essentially residual. The glacial-fluvial deposits take the form of more or less sandy and gravelly outwash and of lacustrine deposits characteristically of heavier textures. The underlying rocks—some hard, some soft—not only have impressed their influence on the soils, but the varying hardness of the different kinds of rocks, such as limestone, sandstone, and shale, explain much of the surface configuration. To some extent the physiographic divisions owe their character to glacial action and weathering. In the eastern parts of this area the Hudson River shales have contributed much material to the soils. Farther up on the Appalachian Plateaus are Onondaga limestones with associated sandstone and shale. Extending westward are flaggy sandstones and dark Marcellus shales; to the north and northwest are alternating shale and sandstone (Schenectady beds); and to the southwest at higher elevations are red and greenish-gray sandstones and shales (Oneonta beds) (*1*, *11*).

Soils developed from deeper glacial till are strongly influenced by the shaly content, have hardpans or claypans at a varying depth, and show different degrees of development. The depth to hardpan, its degree of development, the natural drainage conditions, and the presence or absence of calcium carbonate in the parent material are the important considerations in the identification of these soils.

The soils of the outwash plains, largely sandy, were separated as far as possible on the basis of the kinds of material composing them and the arrangement of the materials in the profile. They are mostly loose rather leachy soils and have undergone considerable eluviation.

The youngest soils of the area are alluvial deposits of the present flood plains and show little soil development or eluviation.

Soils of the Hudson Valley are developed from glacial outwash and lacustrine deposits, from glacial till composed of shaly and slaty materials, and from alluvium. On the Appalachian Plateaus of the western parts of the area are soils mostly with hardpan subsoils, developed from deep glacial till, and extensive areas of shallow soils developed from shallow glacial till and residual materials over the bedrock.

Cossayuna silt loam, shallow phase, represents fairly well the well-developed well-drained soils of the Hudson Valley. As observed 2 miles southeast of Glenville, a profile of this soil shows the following characteristics:

0 to 7 inches, dark grayish-brown or grayish-brown friable silt loam—its friableness enhanced by the presence of many grass roots.
7 to 14 inches, light-brown firm but friable silt loam with color more intense brown in the upper part and diminishing toward the lower part.
14 to 30 inches, yellowish-brown friable silt loam resting on thinly stratified sandstone, which effervesces with hydrochloric acid on freshly broken surfaces.

This profile represents feebly glaciated soil material of sandstone and quartzite materials. The typical Cossayuna silt loam soil is developed from deeper till containing also some limestone and shale and having compact moderately friable fairly well drained subsoils. Some of the soil included with Albia silt loam mapped in the lowland

area has a similar profile. The Albia profile is less well drained, as evidenced by the mottling present above the rather dense subsoil layer.

A profile of Albia silt loam studied one-half mile south of Voorheesville follows. The soil occupies a drumlinlike hill of smooth rounded cutline. It has a mixed grass cover of Canada bluegrass, bentgrass, and timothy, together with such weeds as wild carrot, yarrow, ragweed, and cinquefoil. Nearby timber includes red oak, hickory, ironwood, ash, white pine, hemlock, and some maple.

0 to 7 inches, light-brown or grayish-brown friable silt loam with scattered cobbles and small stones of sandstone quartzite and granite.
7 to 15 inches, yellowish-brown or light yellowish-brown friable silt loam, in the lower part becoming stained with rusty yellow.
15 to 30 inches, compact gritty silty loam, approximating a hardpan. The predominating color is brown, more grayish-brown in the upper part, mottled with yellow, rusty yellow, gray, and brown.
30 inches +, mottled dark-brown, brown, and dull-yellow very dense compact brittle hardpan of gritty silt loam or silty clay loam.

The soil in all horizons is acid in reaction in this sample, but in other areas in the vicinity the reaction is alkaline at a depth ranging from 30 to 45 inches.

Associated generally with the Albia soils and developed from much the same kind of material are the Boynton soils. These soils occupy low hills and lower slopes, and the moderate slopes and compact subsoils retard drainage to a greater degree than in the Albia soils. Mottling in the subsurface layer, generally at a depth of 8 to 12 inches, indicates slow internal drainage.

Mansfield silt loam is the most poorly drained associated soil and is developed here mainly from the shales and miscellaneous materials like those of the Albia and Boynton soils.

The Nassau soils are composed largely of residual materials derived from the underlying metamorphosed shaly rocks. The soil is thin, considerably eroded, and in many places entirely lacking, exposing the bedrock.

The soils included on the outwash plains and terraces are composed predominantly of coarse materials, and the associated lacustrine soils are characterized by heavier materials. These soils differ noticeably in the kinds of materials composing them and in their profile arrangement. Most of them are nearly level and well drained. The characteristic virgin tree growth was white pine and oak, with some locust and birch.

The Chenango soils are developed largely from more or less rounded water-deposited fragments of sandstone and shale. The material of the profile is acid, although in places, at a depth ranging from 5 to more than 8 feet, some limestone gravel or lime-encrusted gravel is present. The Schodack soils are closely associated with the Chenango soils, but differ in their more broken surface, less uniform arrangement of the soil materials, and the presence of limestone materials at less depth.

The Hoosic soils are derived from slaty outwash materials, in addition to sandstone and shale, and the soil types are of the coarser textures. The entire soil is acid. The Copake soils differ from the Hoosic only in containing limestone fragments or lime-encrusted gravel in the subsoil from 6 to 10 feet below the surface.

The Colonie soils are deep, acid sandy soils, with the deep substratum largely of alkaline fine sand containing much dark mineral matter.

The acid Braceville soils, associated with the Chenango soils, differ from them in having a compact layer above the gravelly subsoil that intercepts the downward-moving water and causes imperfect internal drainage.

The Granby soils have dark surface soils and lighter colored sandy subsoils. They occupy low, poorly drained positions. The subsoils are alkaline, and the upper horizons are only slightly acid in reaction.

Soils of the lacustrine deposits have subsoils of fine heavy materials, mostly laminated clay. The Hudson soils are representative. They supported originally a mixed hardwood forest. A description of a profile of Hudson silty clay loam follows. Its location is 1 mile northeast of South Albany, in a good pasture in which Rhode Island bentgrass, Canada bluegrass, and timothy predominate. Elm trees stand in fence rows.

0 to 8 inches, dull-brown friable light silty clay loam modified with some very fine sand. The reaction is acid.

8 to 15 inches, dull grayish-brown granular friable silty clay loam, rather looser in consistence than the material in the surface layer, but, like it, acid in reaction.

15 to 22 inches, light-brown or yellowish-brown acid compact silty clay loam highly mottled yellow, gray, rusty brown, and light reddish brown.

22 to 40 inches, light reddish-brown or faintly ruddy brown compact somewhat plastic silty clay faintly mottled with brown, grayish brown, and gray. The material has irregular fracture, slightly vesicular structure, and alkaline reaction.

The Orono soils are developed from the same kind of parent materials as the Hudson. They occupy flats and depressions where the run-off is slow—a condition favoring the accumulation of organic matter on the surface and much mottling in the subsoil.

The Claverack soils are distinguished by their sandy layers over the lacustrine deposits. The clay subsoil and substratum intercept downward-moving water to the extent that mottling is produced in the lower parts of the sandy layers. Besides a fine sandy loam type, a deep phase of this type is recognized, in which the clay layers are more deeply buried by sandy layers.

The Wauseon soils have dark-colored surface soils and mottled gray and brown calcareous clay subsoils. They occupy low indefinite drainage positions and are more poorly drained than the Orono soils.

In the valleys of the plateau section, the Pittsfield soils are derived from till composed largely of limestone but including much shale and slaty material. Both surface soil and subsoil are friable. The material below a depth of 18 to 20 inches in most places is alkaline.

The Wooster soils are light colored and are derived from sandstone and shale materials. The soil materials are deep, friable, and acid in reaction. As mapped they represent a transition between the Gray-Brown Podzolic and the Brown Podzolic soils. The Poland soils are dark soils derived from dark shales and limestone. The soil mantle is comparatively thin over the rock, but the soil generally has good moisture-holding capacity. The parent material is normally alkaline. This dark soil should probably be classed as Brown Forest soil (Braunerde).

The Farmington soils also are derived from limestone materials but represent a thin feebly glaciated mantle over the limestone. The soil is friable, well drained, and to a large extent residual.

The Langford soils are derived from calcareous glacial till of sandstone and shale rocks. The upper horizons are friable and well drained, and they overlie compact mottled subsoils. The profiles resemble those of the Albia soils. The Canfield soils differ from the Langford mainly in being derived from acid sandstone and shale till.

The Erie soils are developed from the same kind of glacial till as the Langford soils but are more poorly drained. Alternate wet and dry conditions over a long period have resulted in the development of a hardpan and the formation of distinctly mottled upper layers. The Volusia soils have similar profiles but are derived from strongly acid parent material.

The Chippewa soils are Half-Bog soils associated with the Erie and Volusia soils and are almost permanently wet. The surface soil is dark; the subsoil is mottled and normally acid. The Norwich soils resemble the Chippewa in drainage but are derived from glacial deposits of brown and light-red sandstone and shale, whereas the Chippewa soils are derived from glaciated gray sandstone and shale. The Lyons soils associated with the Pittsfield and Farmington soils are likewise poorly drained Half-Bog soils. The surface soils are medium or slightly acid, and the lower part of the subsoil is generally alkaline in reaction.

The Lordstown soils are Lithosols, approaching the Brown Podzolic soils in character and derived from shallow beds of feebly glaciated gray acid sandstone and shale materials.

The Lackawanna soils are Brown Podzolic soils, approaching Lithosols in character. They are almost as shallow as the Lordstown soils, are equally friable, but are derived from the slightly glaciated reddish-brown and light-red gritty sandstones and shales, somewhat broken up by glaciers.

The Culvers soils are derived from the same class of materials as the Lackawanna soils but are deeper and have profiles similar to those of the Canfield soils.

The Schoharie soils of lacustrine origin here are isolated in the plateau section. They are derived from pinkish-brown or light reddish-brown calcareous clayey materials. The surface soils are light brown and the subsoils pinkish brown, with some mottling over the denser subsoil, indicating slow drainage. The subsoil is alkaline and in many places contains free lime.

The soils of the present flood plains are recent alluvial deposits and have young or undeveloped profiles. They are separated on the basis of their composition and their condition of drainage. The best drained soils are the Genesee and Tioga. The former are alkaline and the latter acid. Imperfectly drained soils are represented by the Eel and Middlebury soils. The former are alkaline and the latter acid. The Wayland soils are poorly drained and alkaline. Alluvial soils, undifferentiated, include bottom lands varying widely in texture, drainage, and reaction, but most of the soil so classified has poor drainage.

Muck consists of generally shallow accumulations of more or less decomposed organic matter mixed with some mineral matter. Peat

consists of deeper deposits of slightly decomposed raw fibrous organic matter.

Table 12 gives the results of pH determinations on samples of four soils from this area.

TABLE 12.—*pH determinations of four soil profiles from Albany and Schenectady Counties, N. Y.*[1]

| Soil type and sample No. | Depth | pH | Soil type and sample No. | Depth | pH |
|---|---|---|---|---|---|
| Boynton clay loam: | *Inches* | | Schodack gravelly loam: | *Inches* | |
| 1648147 | 0- 7 | 5.0 | 164807 | 0-6 | 4.9 |
| 1648148 | 7-14 | 4.6 | 164808 | 6-19 | 5.4 |
| 1648149 | 14-24 | 5.4 | 164809 | 19-40 | 5.3 |
| 1648150 | 24-40+ | 7.2 | Tioga silt loam: | | |
| Albia silt loam: | | | 164840 | 0-22 | 5.8 |
| 1648136 | 0- 7 | 5.0 | 164841 | 22-40 | 6.0 |
| 1648137 | 7-15 | 5.0 | | | |
| 1648138 | 15-30 | 5.2 | | | |
| 1648139 | 30-45+ | 5.3 | | | |

[1] Determinations made by E. H. Bailey, assistant soil technologist, by the hydrogen-electrode method.

The mechanical analyses of certain soils are given in table 13.

TABLE 13.—*Mechanical analyses of five soils from Albany and Schenectady Counties, N. Y.*

| Soil type and sample No. | Depth | Fine gravel | Coarse sand | Medium sand | Fine sand | Very fine sand | Silt | Clay |
|---|---|---|---|---|---|---|---|---|
| Hornell silty clay loam: | *Inches* | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* | *Percent* |
| 164826 | 0-2 | 2.0 | 3.3 | 3.2 | 6.4 | 4.2 | 30.4 | 50.6 |
| 164827 | 2-13 | .9 | 3.5 | 3.0 | 6.3 | 4.2 | 39.2 | 42.8 |
| 164828 | 13-25 | 3.8 | 11.8 | 4.5 | 5.5 | 3.5 | 29.2 | 41.6 |
| 164829 | 25+ | .4 | 1.4 | 1.1 | 2.3 | 2.2 | 28.9 | 63.8 |
| Boynton clay loam: | | | | | | | | |
| 1648147 | 0- 7 | 2.3 | 5.3 | 5.6 | 9.0 | 8.2 | 35.3 | 34.4 |
| 1648148 | 7-14 | 1.1 | 3.4 | 2.8 | 6.1 | 5.2 | 28.1 | 53.3 |
| 1648149 | 14-24 | 3.6 | 5.7 | 4.0 | 7.4 | 6.3 | 28.1 | 45.0 |
| 1648150 | 24-40+ | 2.8 | 4.9 | 3.8 | 7.4 | 7.6 | 32.0 | 41.5 |
| Colonie gravelly sandy loam: | | | | | | | | |
| 1648192 | 0- 8 | 4.0 | 15.2 | 18.5 | 25.0 | 7.2 | 14.9 | 15.1 |
| 1648193 | 8-16 | 5.2 | 16.2 | 20.9 | 26.0 | 5.5 | 12.8 | 13.3 |
| 1648194 | 16-40+ | 1.3 | 4.3 | 9.4 | 61.1 | 12.4 | 4.6 | 6.9 |
| Hudson silt loam: | | | | | | | | |
| 1648185 | 0- 7 | .2 | .6 | 1.1 | 2.1 | 1.8 | 67.0 | 27.2 |
| 1648186 | 7-15 | .3 | .9 | 1.5 | 2.9 | 2.6 | 64.5 | 27.2 |
| 1648187 | 15-30 | .2 | .8 | 1.5 | 3.2 | 3.3 | 64.0 | 26.9 |
| 1648188 | 30-45 | .0 | .2 | .4 | 1.5 | .8 | 62.1 | 35.0 |
| Volusia silty clay loam: | | | | | | | | |
| 1648169 | 0- 7 | 2.0 | 2.2 | 1.9 | 7.3 | 8.8 | 43.9 | 33.9 |
| 1648170 | 7-12 | 4.8 | 5.1 | 3.0 | 8.0 | 9.5 | 48.1 | 21.6 |
| 1648171 | 12-22 | 2.7 | 3.6 | 3.0 | 12.1 | 14.4 | 32.5 | 31.7 |
| 1648172 | 22-36+ | 5.7 | 6.0 | 3.4 | 9.1 | 8.6 | 39.9 | 27.3 |

## SUMMARY

Albany and Schenectady Counties are situated in eastern New York and have a total area of 733 square miles.

The area is included in two main physiographic divisions: (1) The eastern part lies in the Hudson Valley, and (2) the western part lies on the relatively high Appalachian Plateaus. The lowland area is undulating to somewhat rolling, ranging from near tidewater to 400 feet in elevation. The Appalachian Plateaus, marked on the eastern border by a well-defined escarpment known as the Helderberg escarpment, has a more variable surface ranging from gently rolling to

hilly and broken. Here, the elevation ranges from about 700 feet to a maximum of over 2,100 feet.

Much manufacturing is carried on in the populous centers about the cities of Albany and Schenectady. Transportation, both by water and by rail, is excellent, and markets are good.

The climate is humid and largely continental, with cold winters and short, warm summers. The average frost-free season on the lowlands varies from 156 to 175 days, and on the highlands the period is shorter. The climate favors the normal growth of grasses, grains, and other subsistence crops needed in dairy and livestock farming, as well as a wide range of vegetables and fruits. Most of the soils of the area are well suited for the production of grasses and clovers, which early encouraged the raising of livestock. Milk has become the chief source of farm income. Poultry raising and fruit growing are important minor enterprises nearer the populous centers. Near these centers considerable soil areas are sandy and gravelly and not adapted for the production of grasses, but many of these soils are used successfully for growing a variety of vegetable crops, which find ready sale on the city markets.

All the surveyed area was at one time glaciated, and the glaciers left a variety of till materials, outwash, and lacustrine deposits. Some alluvium has been deposited recently. The general region is one of the Gray-Brown Podzolic soils, and most of the well-drained soils are light colored.

The soils are conveniently grouped, in general, in two main physiographic divisions. The soils of the Hudson Valley have been formed from glacial till, outwash, and lacustrine deposits. Those from glacial till, the Cossayuna and Albia soils, have fairly good drainage and are productive. The Nassau soil is well drained but thin and droughty. The Hornell and Boynton soils are less well drained and the productivity is low, and the Mansfield soils are rather too wet for use other than for grass or trees.

The soils of the outwash plains generally are gravelly and sandy. The heavier members, such as the Chenango, have value as orchard and general cropland, and the others, the Copake, Hoosic, and Colonie, more generally sandy, are of some use for vegetable crops. The Schodack soils are gravelly and sandy and are too droughty for most crops. The Braceville and Granby soils are poorly drained. Those soils of predominantly silty and clayey materials, such as the Hudson and Orono, are good for grass and small-grain crops, and the Claverack soils, having sandy surface layers, are good for general and vegetable crops. The Livingston and Wauseon soils are poorly drained.

On the Appalachian Plateaus the deeper, better drained, more productive till soils are the Pittsfield soils, influenced by the limestone content; the Wooster, derived from sandstone and shale materials; and Poland silt loam, developed from dark-colored shale material. The Farmington, Lordstown, and Lackawanna soils are rather droughty because the bedrock lies at slight depths beneath them. The Langford, Canfield, Culvers, and Schoharie soils are imperfectly drained and have compact mottled subsoils. They are fairly productive for the general crops. The more poorly drained associated soils

of the Erie and Volusia series are not so productive but are fairly good soils for grass.

The Chippewa, Norwich, Lyons, and Allis soils are poorly drained and are useful chiefly for pasture.

The Genesee and Tioga soils are well-drained productive soils of the flood plains. The Eel and Middlebury soils are less well drained, and their use is limited proportionately. The Wayland soil is poorly drained.

Miscellaneous soils and land types, such as alluvial soils, undifferentiated, and peat, muck, made land, and rough stony land, as well as the steep and broken phases of the Hudson, Colonie, Poland, Lackawanna, Lordstown, Langford, and Culvers soils, have very slight agricultural value.

## LITERATURE CITED

(1) GOLDRING, WINIFRED.
1935. GEOLOGY OF THE BERNE QUADRANGLE. With a chapter on glacial geology by John H. Cook. N. Y. State Mus. Bul. 303, 238 pp., illus.

(2) GUSTAFSON, A. F., BUCKMAN, H. O., and COOPER, H. P.
1930. SOIL AND FIELD-CROP MANAGEMENT FOR CHENANGO COUNTY, NEW YORK. N. Y. (Cornell) Agr. Expt. Sta. Bul. 514, 82 pp., illus.

(3) ———
1932. SOIL AND FIELD-CROP MANAGEMENT FOR CAYUGA COUNTY, NEW YORK. N. Y. (Cornell) Agr. Expt. Sta. Bul. 538, pp. 1–88, illus.

(4) ——— and MUNSELL, JOHN H.
1886. HISTORY OF THE COUNTY OF SCHENECTADY, N. Y., FROM 1662 TO 1886.... 218 pp., illus. New York. (Bound with Bi-Centennial History of Albany. History of the County of Albany, N. Y., from 1609 to 1886.)

(5) HOWELL, GEORGE ROGERS, and TENNEY, [JONATHAN].
1886. BI-CENTENNIAL HISTORY OF ALBANY. HISTORY OF THE COUNTY OF ALBANY, N. Y., FROM 1609 TO 1886. 997 pp., illus. New York. (Bound with History of the County of Schenectady, N. Y. . . .) 2 v.

(6) LYON, T. L.
1931. FERTILIZER TESTS OF SEVERAL SOIL TYPES. N. Y. (Cornell) Agr. Expt. Sta. Bul. 520, 19 pp., illus.

(7) ——— and BIZZELL, JAMES A.
1913. EXPERIMENTS CONCERNING THE TOP-DRESSING OF TIMOTHY AND ALFALFA. N. Y. (Cornell) Agr. Expt. Sta. Bul. 339, pp. [117]–144, illus.

(8) MARBUT, C. F.
1935. SOILS OF THE UNITED STATES. U. S. Dept. Agr., Atlas of American Agriculture, pt. 3, 98 pp., illus.

(9) MORDOFF, R. A.
1925. THE CLIMATE OF NEW YORK STATE. N. Y. (Cornell) Agr. Expt. Sta. Bul. 444, 38 pp., illus. [Revised, 1934.]

(10) NEW YORK STATE DEPARTMENT AGRICULTURE AND MARKETS.
1935. STATISTICS RELATIVE TO THE DAIRY INDUSTRY IN NEW YORK, 1934-1935. N. Y. State Dept. Agr. and Markets Bul. 300, 234 pp.

(11) RUEDEMANN, RUDOLF.
1930. GEOLOGY OF THE CAPITAL DISTRICT (ALBANY, COHOES, TROY, AND SCHENECTADY QUADRANGLES). With a chapter on glacial geology by John H. Cook. N. Y. State Mus. Bul. 285, 218 pp., illus.

(12) SHANTZ, H. L., and ZON, RAPHAEL.
1924. NATURAL VEGETATION. U. S. Dept. Agr. Atlas of American Agriculture, pt. [iv], 29 pp., illus.

U. S. GOVERNMENT PRINTING OFFICE: 1941

# Accessibility Statement

This document is not accessible by screen-reader software. The U.S. Department of Agriculture is committed to making its electronic and information technologies accessible to individuals with disabilities by meeting or exceeding the requirements of Section 508 of the Rehabilitation Act (29 U.S.C. 794d), as amended in 1998. Section 508 is a federal law that requires agencies to provide individuals with disabilities equal access to electronic information and data comparable to those who do not have disabilities, unless an undue burden would be imposed on the agency. The Section 508 standards are the technical requirements and criteria that are used to measure conformance within this law. More information on Section 508 and the technical standards can be found at www.section508.gov.

If you require assistance or wish to report an issue related to the accessibility of any content on this website, please email Section508@oc.usda.gov. If applicable, please include the web address or URL and the specific problems you have encountered. You may also contact a representative from the USDA Section 508 Coordination Team.

**Nondiscrimination Statement**

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotape, American Sign Language, etc.) should contact the responsible Agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the

Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at http://www.ascr.usda.gov/complaint_filing_cust.html and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by:

(1) mail: U.S. Department of Agriculture
Office of the Assistant Secretary for Civil Rights
1400 Independence Avenue, SW
Washington, D.C. 20250-9410;

(2) fax: (202) 690-7442; or

(3) email: program.intake@usda.gov.

USDA is an equal opportunity provider, employer, and lender.