Thomaston Rodgers Bedrock Compilation Sheet 2 (paper)

Map

NOTICE !

Bedrock quadrangle 1:24,000 scale compilation sheets for the Bedrock Geological Map of Connecticut, John Rodgers, 1985, Connecticut Geological and Natural History Survey, Department of Environmental Protection, Hartford, Connecticut, in Cooperation with the U.S. Geological Survey, 1:125,000 scale, 2 sheets. [minimum 116 paper quad compilations with mylar overlays constituting the master file set for geologic lines and units compiled to the State map, some quads have multiple sheets depicting iterations of mapping]. Compilations drafted by Nancy Davis, Craig Dietsch, and Nat Gibbons under the direction of John Rodgers.

Geologic unit designation table translates earlier map unit nomenclature to the units ultimately used in the State publication.

JL 19 July 1975

Generalized dips & strikes of foliation

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
STATE OF CONNECTICUT
GEOLOGICAL AND NATURAL HISTORY SURVEY

GEOLOGIC QUADRANGLE MAP
SURFICIAL GEOLOGY
THOMASTON QUADRANGLE, CONNECTICUT
GQ-984

INTRODUCTION

Most unconsolidated (surficial) material in the Thomaston quadrangle is sandy till, deposited by ice probably of two or more separate glacial advances during the Pleistocene Epoch, and much of the rest is Pleistocene stratified drift. Most areas not underlain by glacial drift consist of bedrock outcrops or artificial fill.

The distribution of swamp and marsh deposits was partly inferred from an unpublished soil map of Litchfield County kindly made available by George F. Sweeney of the Soil Conservation Service, U.S. Department of Agriculture. The distribution of areas of abundant bedrock exposures was inferred partly from the soil map and partly from an unpublished bedrock map by Robert M. Cassie (1965). The Connecticut State Water Commission provided information on water wells. The Corps of Engineers, U.S. Army, provided information on two dam sites.

GLACIAL EROSION

Glacier ice picked up almost all preglacial unconsolidated materials in the quadrangle. Glacial or postglacial deposits generally rest directly on hard, fresh bedrock, though weathered rock, probably preglacially weathered, is present at a few places.

Exploratory drilling at the Thomaston Dam demonstrated overdeepening in the main channel of the Naugatuck River and a closed rock basin farther west. Both features probably result from glacial erosion, but at most places erosion of fresh bedrock was probably slight.

TILL

Sandy till, locally known as "hardpan," is the most extensive and probably, on the average, the thickest map unit in the quadrangle. Till also underlies other map units in many places.

The till in the borrow pit one-half mile northeast of the Thomaston Dam is hard, compact, jointed, and in part fissile. Though it is sandy, its content of fines (silt, clay, and rock flour) is apparently higher than that of the tills in many other exposures in the area. Weathering discoloration and oxide accumulations on joints extend irregularly downward. This compact, relatively clayey till is at least 45 feet thick, and underlies about 7 feet of looser, unjointed material, which Pessl and Schafer (1968, page 15, locality 3) identify as colluvium.

Similar compact till was recognized in the borrow pit north of the corner of Northfield and Babbitt Roads, and Schafer (written commun., 1969) has reported other localities (materials symbol *tl*). Thus this material, which Pessl and Schafer (1968) call lower till, is widespread in the area, though it is generally overlain by less compact till and is not known to occur at the surface in areas of mappable size.

The till in many other exposures is loose to moderately compact, contains only a small proportion of fines, and shows little postdepositional oxidation or staining. This till Pessl and Schafer (1968) call upper till. The contrast in degree of oxidation suggests that the lower till was oxidized before the upper till was deposited over it.

The lower till is assigned a pre-Wisconsin age, based on a tentative correlation with a probable pre-Wisconsin till at West Cornwall, some 15 miles northwest of this quadrangle (Warren, in press).

The upper till is of Wisconsin age. In the Litchfield quadrangle to the west, the upper-till ice came from the northwest (Warren, 1970). In the Bristol quadrangle to the east, the last ice movement was from the northeast (Simpson, 1961), although the streamline form of Chippen Hill, in which Simpson reports till 100 feet thick, shows that earlier movement was from west of north. In the eastern part of the Torrington quadrangle (Colton, 1971) to the north, Pessl and Schafer (1968) infer from till fabrics that the lower part of the upper till may have been deposited by ice from the northwest, and the upper part by ice from the northeast.

Probably no late ice from the northeast reached the Thomaston quadrangle, for no till was found with stones of Triassic lithology. The only possible exception to this generalization was in the pit 0.6 mile north of Tolles, where a 6-foot face exposed till-like material with red stones in a red clay matrix. However, this till-like material differed sharply from the sand in other faces in the pit, and may have been rafted down Hancock Brook by ice.

Striae at the quadrangle border northeast of Tolles bear west of south. Perhaps, as Schafer (written commun., 1969) suggests, the southwest-moving ice at Bristol was near the southwest margin of a lobe or short tongue of ice that extended a few miles down the Connecticut Valley, beyond the main line of the front of active ice, during the northward retreat of the front. If so, the widest part of such a lobe, at its head, might have produced striae oriented like those northeast of Tolles without bringing in stones from the Connecticut Valley.

STRATIFIED DRIFT

Much stratified drift was deposited in the Thomaston quadrangle during deglaciation. Most of this is fluvial sand and gravel; deltaic sand and gravel are present near Black Rock Pond and Hancock, but no lacustrine silts and clays are known.

Probable early deposits.——Because the ice front probably retreated northward, the oldest stratified drift deposits are believed to be ice-contact deposits on uplands in the south. Those southeast of Hancock Brook (Qcdt) are in places entirely sand but locally contain much gravel. The gravel contains scattered pebbles of red arkosic sandstone from the Triassic rocks of the Connecticut Valley. The deposits reach elevations of more than 900 feet, and are partly deltaic, dropped by streams that flowed from ice to the east or southeast into a high-level lake. Ice must have covered much of the area to impound the lake.

Smaller upland deposits of stratified drift essentially without stones of Triassic provenance (Qcd) were probably also deposited in contact with ice. The deposits near Wilton, Wilson, and Northfield Ponds and on Steel Brook are predominantly sandy; those south of Campville are gravelly but thin. These deposits undoubtedly differ considerably in age.

The ice-contact deposits in the southern part of the (Qcd) area along South Main Street in Terryville are graded to the spillway to the south, which Simpson (1961) describes as a "mile west of Pequabuck village." They are higher and somewhat older than the deposits to the north along Poland River (Qcd) and the fill to the south along Hancock Brook (Qgft). The fan south of the spillway (Qgf) is probably contemporary with them.

Hancock Brook valley deposits.——Along Hancock Brook, stratified drift containing stones derived from Triassic rocks of the Connecticut Valley (Qgft) was aggraded to a profile that apparently sloped from approximately 620 feet near the Bristol quadrangle border to 600 feet southwest of Terryville Tunnel, 555 feet near Tolles, 525 feet near Hancock, and 480 feet near the Waterbury quadrangle border. The proportion of stones of Triassic lithologies decreases irregularly from more than 20 percent in the Bristol quadrangle to less than 5 percent in the Waterbury quadrangle. Presumably the decrease is caused partly by dilution (inmixing of other stones) and partly by rapid wear of the weak Triassic rocks.

The Hancock Brook deposits vary in grain size. Near Tolles, silt and, locally, clay are present. Yet the fan built into the preglacial Todd Hollow Brook valley, farther downstream, contains well-rounded Triassic sandstone boulders as much as 2 feet in diameter and granitic boulders more than 4 feet in diameter. This variation might suggest a head-of-outwash between Hancock and Tolles. However, the Triassic stones were probably brought by melt water from farther east, for apparently no ice carrying Triassic rock debris ever reached the Thomaston quadrangle.

The Hancock Brook stratified drift fill was apparently deposited under conditions intermediate between those of typical ice-contact deposits and those of outwash. Simpson (1961) delineated the upstream extension of these deposits in the Bristol quadrangle as outwash, but Schafer (written commun., 1969) considers their downstream continuation in the Waterbury quadrangle to be of ice-contact origin.

Much of the valley was probably free of ice, for no kettles were recognized. The fill-surface remnant southwest of the Terryville Tunnel is irregular, with poorly integrated and graded drainage that suggests collapse, but the swales could reflect stream-bed relief developed by a deep flood; the large boulders present suggest torrential conditions.

Ice probably filled the area mapped as alluvium 0.5 mile west of Tolles; the topography there is difficult to account for if outwash filled the valley to the inferred profile. Ice was probably also present in the preglacial valley of Todd Hollow Brook. The westward slope of the Hancock Brook fan should have crowded Todd Hollow Brook against the western wall of the valley, and the most obvious mechanism for shifting it eastward to its present coarse is collapse resulting from melting out of ice buried under the fan. Moreover, considerable ice was apparently present in the Todd Hollow Brook valley at the time the deposits there (Qcd) were accumulated, and these deposits are very likely contemporary with the Hancock Brook deposits.

The Hancock Brook fill was apparently thick enough to reverse the preglacial drainage from a point 0.4 mile east of the quadrangle to a preglacial divide west of Tolles. The tributary from the south at Tolles is barbed to the present Hancock Brook, and the preglacial ancestor of the Buttermilk Falls brook probably flowed northwest and was similarly barbed. The Hancock Brook valley widens northward except where narrowed by till. Thus the preglacial drainage was probably northward from Tolles to a junction with the Pequabuck River in the Bristol quadrangle. If so, Simpson's "spillway . . . half a mile south of the northeast portal of the Terryville Tunnel" is merely the head of a valley fill, against ice that stood in the Pequabuck valley. The true spillway, where melt waters spilled across a bedrock divide, lies west of Tolles. It may have been 0.3 mile southwest of Tolles, where anastomosing rock gorges as much as 20 feet deep imply torrential erosion.

Deposits along Poland River and Todd Hollow Brook.———The Poland River valley contains sand and gravel deposits, parts of which have rolling collapsed topography of ice-contact origin (Qcd). The melt-water streams that deposited this material were graded to an accordant junction with contemporary streams that were building a kame terrace on the southeast side of Chippen Hill, in the Bristol quadrangle to the east (Simpson, 1961). Both deposits appear to be graded to Simpson's "spillway" southeast of the Terryville Tunnel, at the head of his valley train which extends into this quadrangle as the Hancock Brook deposits (Qgft). Thus the Poland River deposits are probably contemporary with at least the uppermost part of the Hancock Brook deposits, though they lack pebbles from the Triassic rocks of the Connecticut Valley. The Triassic pebbles evidently came from the streams that were depositing the Chippen Hill kame terrace (Simpson, 1961); some of the gravels at Chippen Hill contain more than 40 percent of such pebbles.

The stratified drift along Todd Hollow Brook (Qcd) is largely sand. It is partly of ice-contact origin, with collapsed topography, and partly deltaic, with foresets that dip south. It is very possibly contemporary with the Hancock Brook deposit (Qgft), deposited in response to damming by the fan from Hancock Brook, though it may be older.

Naugatuck Valley deposits.— Stratified drift (Qgf) is present at many places along the sides of the Naugatuck Valley. The grain size decreases irregularly downstream; the material near the north edge of the quadrangle is coarse, with many rounded boulders 1 to 4 feet across, and that in the south is sand and pebble gravel, with only scattered cobbles. Material of similar nature and origin underlies parts of the alluvium on the valley floor. The age of these deposits relative to that of the Hancock Brook-Poland River deposits is not known.

In places the stratified drift forms distinct terraces, and the highest of these, in various protected reentrants on both sides of the valley, fall on a profile that stands about 50 feet above the present river in the north and about 70 feet above it in the south. Though thin gravels, interpreted as of ice-contact origin (Qcd), extend above this profile south of Campville, nearly all the stratified drift in the valley lies at or below it. The terraces apparently record an episode of widespread deposition that aggraded to this profile. The present profile of the Naugatuck River, however, is at least as low as the preglacial one, for bedrock is exposed both in the river bed and at close intervals across the valley at three places about 0.4 mile above the mouth of Leadmine Brook, below the site of Reynolds Bridge, and near the south edge of the quadrangle.

This aggradation may have occurred either as outwash (a valley train that filled the entire width of the valley to depths of 50 to 70 feet) or as ice-contact deposits (a series of kame terraces and collapsed deposits accumulated beside and over stagnant ice). The outwash hypothesis gets some support from the irregular southward decrease in grain size, which may suggest an ice-contact head-of-outwash in the north and a valley train to the south. On the other hand, the outwash hypothesis requires that the Naugatuck River has subsequently removed a volume of material that may seem improbably large; this may give some support to the ice-contact hypothesis.

The aggradation in the Naugatuck Valley ponded Branch Brook. The Naugatuck River spilled across the divide near the intersection of State Route 109 and U.S. Route 6, building a delta foreset westward into this pond. Deltas were also built into the same pond from the west (by melt waters coming down Branch Brook) and from the south. A fourth delta was presumably built from the southeast, by the Naugatuck River, but no exposures of it were found.

The aggradation in the Naugatuck Valley also caused Nibbling, Northfield, and Spruce Brooks to aggrade in their lower courses. Stratified drift along Leadmine Brook and its tributary Rock Brook (Qcd) may be graded to the same fill, or may be even younger; most of it is sand.

POSTGLACIAL AND POSSIBLY LATE-GLACIAL DEPOSITS AND ARTIFICIAL FILL

Less than 5 percent of the Thomaston quadrangle is underlain by postglacial deposits and artificial fill. The areally and volumetrically most important of these materials have been emplaced by man rather than by water or ice. Such materials, delineated as artificial fill (af), include many pits and rock cuts that have been partly filled or graded. Other deposits are alluvium (Qal) and swamp and marsh deposits (Qsm). A small landslide northwest of Thomaston (Qls) and four small fans (Qf) may be postglacial or may date from late-glacial time.

ECONOMIC AND ENVIRONMENTAL CONSIDERATIONS

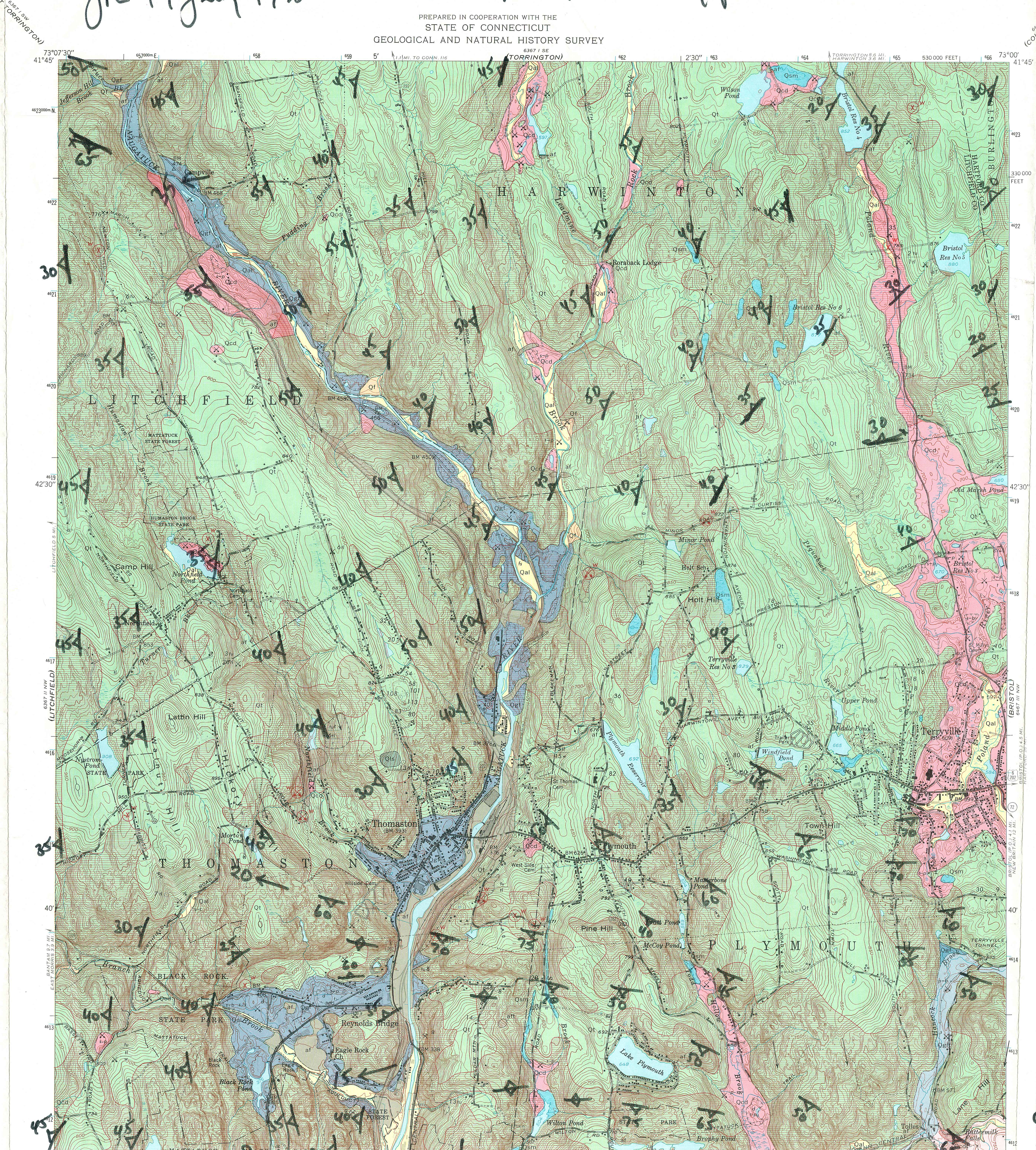
Economically significant products in the surficial materials of the Thomaston quadrangle include till, sand and gravel, water, and possibly peat. Till is available in large quantities in many parts of the quadrangle. Fills of properly compacted till are generally stabler than those of sand and gravel, though till is somewhat more difficult to dig and handle, and is more susceptible to frost damage where the water table is high. Areas mapped as till without abundant bedrock exposures are generally the areas best suited for sanitary-land-fill waste-disposal operations.

Reserves of sand and gravel near the confluence of Hancock and Todd Hollow Brooks are probably large, and their exploitation could produce a pond of fair size. Sand and some gravel are also available in the ice-contact deposits east of Hancock (Qcdt), and possibly in the Hancock Brook deposits (Qgft) north of Tolles. Reserves elsewhere appear to be small. Most stratified drift areas are poorly suited for waste disposal, but the sand hills southeast of Buttermilk Falls may be geologically suitable for disposal of liquid wastes. Tests should be made to determine the depth to the water table; if the water table is deep, the sands should provide not only good filtration, but also aeration to reduce biologic oxygen demand.

Water is obtained in considerable quantities from wells in gravels along Branch Brook. Stratified drift deposits along Poland River, Todd Hollow Brook, and Hancock Brook would probably yield water also.

Peat is present in several swamps in the area, and some of it is probably of commercial quality for use as a soil conditioner in gardens. However, quantities are small.

The landslide area northwest of Thomaston is underlain by an unusual clayey material, which has undoubtedly facilitated the sliding. Further sliding may be expected where this material is present, but it was not found in other parts of the quadrangle, and in most places soil stability presents no unusual problems.



EXPLANATION

Holocene

Qal — Alluvium

Gravel, sand, silt, and clay in flood plains along streams

Qsm — Swamp and marsh deposits

Undecomposed to partly decomposed organic matter, generally mixed or interbedded with varying amounts of clay, silt, and sand

Qf — Fan deposit

Sand and gravel, in part tabular fragments of schist. Possibly of outwash origin, possibly postglacial

Qls — Landslide deposit

Till with hummocky surface believed to be caused by slumping

Pleistocene

Qcd, Qcdt — Ice-contact stratified drift

Sand and gravel, generally with scattered angular boulders which may be as much as 25 feet in diameter, deposited by one or more melt-water streams adjacent to stagnated glacier ice. Collapse structures present in places; east of the Naugatuck Valley, collapse topography common, in places with kettles. One red shale pebble was found at the pit north of Wilton Pond, and one red arkose pebble at the large pit near Todd Hollow Brook

Qcdt, *deposit containing as much as 2 percent of red arkose, sandstone, and shale pebbles from the Triassic rocks of the Connecticut Valley, to the east*

Qgf, Qgft — Glacio-fluvial deposits, undifferentiated

Sand and gravel, generally with scattered angular boulders, deposited by a melt-water stream, possibly beyond areas of significant amounts of residual ice. Includes redeposited material on cut terraces and slump and colluvial material on slopes. Coarse texture of Qgf *in the Naugatuck Valley near north edge of quadrangle suggests proximity to ice-contact head of deposit*

Qgft, *deposit containing red arkose, sandstone, and shale pebbles from Triassic rocks of the Connecticut Valley; proportion decreases irregularly downstream from more than 20 percent south of the Terryville Tunnel to about 5 percent north of Tolles and less than 5 percent at the border of the Waterbury quadrangle. The* Qgft *deposit heads in the Bristol quadrangle (Simpson, 1961)*

Qt — Till

Mixture of sand and silt with rounded to angular pebbles and cobbles, some rock flour, clay, and boulders; dominantly nonsorted, but commonly with pockets, lenses, and irregular bodies of stratified sand and gravel that may be contorted, faulted, or standing on edge. Most of the till is loose to moderately compact, unoxidized, and without rusty staining except where it incorporates stained lower till. Such till, the upper till of Pessl and Schafer (1968), is of Wisconsin age; most of it, but not all, is older than Qcd. *Locally till is hard, compact, jointed, and apparently higher in fines; such till, the lower till of Pessl and Schafer (1968), is generally oxidized and stained rusty to yellow brown, with oxides deposited along the joints, and may be fissile; it is probably of pre-Wisconsin (Illinoian?) age*

QUATERNARY

Area of abundant bedrock exposures

The unconsolidated material between the rock exposures is generally less than 10 feet thick. Small swamps commonly present. Scattered bedrock exposures occur in many additional places

af, aft — Artificially graded or filled area

Material emplaced by man. Most fills consist chiefly of till material, except along the new State Route 8, where fills include subgrade of sand and gravel and many include much broken rock

aft, *trash fill (dump)*

Contact

Dashed where approximately located

Glacial grooves, striae, or both

Arrow shows inferred direction of ice movement. Point of observation is at tip of arrow

Long axis of streamline till deposit

Hill of till, with or without rock core, whose long axis is inferred to indicate the direction of ice movement; includes drumlins

w w

Weathered bedrock

Exposure where the upper part of originally hard bedrock is friable, so disintegrated that it crumbles in the hand. Where symbol is combined with pit symbol, exposure is in a till pit

Melt-water channel

Dry channel inferred to have been carved by a melt-water stream or the outlet of an ice-dammed lake (generally omitted in areas of abundant bedrock exposures). Arrow indicates inferred direction of stream flow

s-p d g

Pit — Large or multiple pit — Abandoned pit — Abandoned quarry

Pits and quarries

Pits and quarries identified as abandoned appear not to have been worked for several years. Letter symbols are: d, *deltaic (lake) deposit;* i, *ice-channel filling.* g, *granitic-rock quarry;* m, *marble quarry;* sc, *schist quarry*

6tu — s-c — $\frac{5tl}{15w}$ — 20

Surficial materials

Materials in pit or at point indicated are identified as follows: b, *boulder gravel;* c, *cobble gravel;* p, *pebble gravel;* s, *sand;* fs, *fine sand;* ṡ, *silt;* t, *till;* tu, *upper till, and* tl, *lower till, of Pessl and Schafer (1968);* af, *artificial fill;* r, *bedrock;* w, *weathered bedrock. Numeral denotes exposed thickness in feet. Read a dash between symbols as "to". Superposition of symbols indicates superposition of materials. Numeral alone indicates reported depth to bedrock, in feet, in a selected well or test boring; well-log data of varying reliability*

45

Generalized dip + strikes of various foliation

Vertical foliation

20

Prominent lineation

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SURFICIAL GEOLOGIC MAP OF THE THOMASTON QUADRANGLE, LITCHFIELD, NEW HAVEN, AND HARTFORD COUNTIES, CONNECTICUT

By
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1972

#49