Ashley Falls 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.

This map set contains unpublished maps, cross- sections, and related information archived by the State Geological and Natural History Survey of Connecticut as part of the Survey Library Collection.

These materials have not been reviewed for accuracy, consistency, or completeness. For many geographic areas, more current information exists, either in published or unpublished form.

These materials were developed under research and mapping agreements between the State Geological Survey and individual scientists, academic institutions, or graduate students. The veracity of the information contained within these documents is the responsibility of the authorship. The State Geological and Natural History Survey of Connecticut, does not promote or endorse this content, nor does the State Survey attest as to its level of accuracy.

These materials have been preserved under a cooperative agreement between the State Geological Survey and the US Geological Survey as part of the National Geological and Geophysical Data Preservation Program. www.datapreservation.usgs.gov

These materials are offered in the spirit of open government. Reproduction of these manuscripts was conducted to the highest practical degree, within the parameters of the funding mechanism. Original documents are available for inspection by contacting the Connecticut State Geologist.

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH
THE COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS
AND
THE STATE OF CONNECTICUT GEOLOGICAL AND NATURAL HISTORY SURVEY

GEOLOGIC QUADRANGLE MAP
SURFICIAL GEOLOGY
ASHLEY FALLS QUADRANGLE, MASS.-CONN.
GQ-936

INTRODUCTION

The main topographic elements of the Ashley Falls quadrangle include parts of the Berkshire Hills on the east and the Housatonic Valley and the Taconic Mountains on the west. Many of the valleys and ridges appear to be controlled by the structure and lithology of the bedrock, although glaciation has modified the landscape. Features associated with glaciation include drumlinoid hills, a large delta, kames and kame terraces, and lake-floor deposits. There is no evidence in this quadrangle for more than one glaciation; this glaciation, on the basis of regional evidence, is probably late Wisconsinan in age. During deglaciation, wastage of stagnant ice proceeded generally from south to north, and glacial melt water was temporarily impounded in the Blackberry and Housatonic River valleys. Features that formed in late glacial and (or) Holocene time include stream-terrace deposits, alluvial-fan deposits, landslide debris, and talus.

QUATERNARY HISTORY

During at least the final episode of ice movement, glacial ice crossed the ridges and valleys in a southeasterly direction, as shown by striae and grooves whose orientations range from S.25°E. to S.61°E. This southeasterly direction of ice movement is also indicated by the orientation of a few drumlinoid hills and the distribution of erratics from unique bedrock sources within or immediately north of the quadrangle. One source of erratics is June Mountain where the garnet schist facies of the Walloomsac Formation of Ordovician age crops out northeast of Sheffield Center in the Ashley Falls and Great Barrington quadrangles. Large erratics of the June Mountain facies lie in a crude fan-shaped area southeast of their source outcrops. East of Smith Hollow, blocks lie on both sides of the road in a well-defined train. Blue-quartz gneiss, another locally unique erratic source, occurs on Brush Hill. Southeast of this outcrop area are scattered boulders of gneiss which have been traced across the Konkapot River south of Mill River (N. M. Ratcliffe, written commun., 1968).

Till-fabric determinations support in part these data on ice movement. Two till-fabric determinations, at points *C* and *D* on the map, suggest ice movement from the north-northwest and from the west-northwest, respectively. At two other points, *A* and *B*, till fabrics are oriented generally north and east-northeast, respectively. The latter two apparently anomalous orientations may have been the result of mass movement on the till slopes. Thus, it appears that ice flow, at least during the last phase of active movement, was in a general southeasterly direction, which agrees with indications of ice movement throughout the Berkshire Hills and Taconic Mountains of Massachusetts.

Evidence of glacial scour and erosion is minimal on the present topographic surface. However, the valley fill in the Housatonic Valley includes glacial-lake deposits to depths of 242 feet; no wells along the river reach bedrock (R. L. Melvin, written commun., 1968; Norvitch and Lamb, 1966, p. 29). This thick valley fill suggests that the Housatonic Valley may have been overdeepened by ice movement before the valley was filled with glacial-lake sediments.

Deposition of till (Qt) was fairly continuous over most of the area, except at higher elevations, on steep slopes, and on summits of some lower hills. Maximum till thickness, as indicated by well data, is as much as 50 feet. Most of the exposed till is sandy, nonindurated, and similar to the upper, younger till of southern New England. However, Taylor (1910, p. 752) found evidence of a lower, indurated drift in the gorge of the Housatonic River about 8 miles north of Sheffield in the Stockbridge, Mass., quadrangle. Future deep excavations in the Ashley Falls area may reveal that the older indurated drift occurs here too, as it does in many areas in southern New England.

Wastage of the ice in the Konkapot and Blackberry Valleys occurred in several stages, as recorded by a series of stagnant ice features. Melting of the ice in the Housatonic Valley took place without forming stagnant ice features on the valley sides, or if these features were formed they were eroded or buried by lake sediments and alluvium.

Perhaps the first area free of ice was in the southeast corner of the quadrangle in the Blackberry Valley. Subsequently, melt water flowed into this part of the valley from the upper Blackberry drainage, from the Whiting River, and from ice associated with the large kame delta in the lowland southeast of Rattlesnake Hill (the East Canaan delta). This melt water was impounded and locally formed a lake whose highest shoreline was slightly more than 883 feet above sea level, which is the elevation of the topset-foreset interface in the East Canaan kame delta. The direction of melt-water flow, at least during the later phase of construction of this kame delta was toward the east, as indicated by the dip of the foreset bedding. The western limit of this lake is unknown, but probably was in the Housatonic Valley or near the mouth of the Blackberry River. No corresponding delta or shore features occur in the Housatonic Valley to the south or southwest, as indicated by reconnaissance studies in that area and by tracing the contours of the topographic maps adjacent to the Ashley Falls quadrangle. If the western limit of this small lake had been blocked in the lower Blackberry Valley, a spillway may have operated through the prominent notch on the northwest end of Canaan Mountain. The eastern, southern, and northern boundaries of this lake were formed by topographic barriers. Probably by coincidence, deltas formed in the Stockbridge quadrangle at about the same level as the East Canaan lake (fig. 1). However, there is no persuasive evidence at present that the East Canaan lake was related to the lake in the Stockbridge area.

Later a long narrow lake (the Falls Village lake) filled the Housatonic Valley (fig. 1) as shown by the distribution of lake-floor deposits in wells. The hypothetical outline of the maximum extent of these lake sediments is projected on the assumed tilt rate in this area (about 5 feet per mile). The hypothetical outline of the sediments is outside the known distribution of lacustrine sediments indicated by well records (fig. 1). The minimum height of this lake was controlled by the bedrock threshold in the Housatonic River valley at Great Falls near Falls Village, Conn., presently about 630 feet above sea level (see profile *A-A'*). This minimum level of the lake is about 30 feet above the maximum level of the nearby Lime Rock glacial lake (fig. 1), and about 140 feet below the maximum level of the East Canaan glacial lake. Therefore, two lake phases existed in the Ashley Falls quadrangle, the relatively extensive Falls Village lake, somewhat higher than the Lime Rock glacial lake, and the East Canaan lake, about 140 feet higher than the Falls Village lake level.

After the lake waters in the East Canaan area drained, gravel, sand, and boulders (Qst_1) were deposited in the upper Blackberry and Whiting Valleys. The source of the deposits was probably from melt water in the headwaters of the streams beyond the quadrangle boundary.

During or possibly somewhat after the construction of the East Canaan delta, a body of stagnant ice remained in the vicinity of Mill River at a relatively high level, creating a sandy kame complex (Qcd_2), including a small side-hill esker (Qic). Although no large exposures of deltaic bedding were observed in the generally slumped exposures of the Mill River deposits, the deposits appear to consist of about 5 feet of horizontally bedded medium gravel overlying several tens of feet of medium sand, similar to the composition of the East Canaan delta. Part of this kame complex may have been built into a local pond. Stagnant ice in the Mill River area also produced valley-train sediments at relatively high levels on the Konkapot River and its tributaries; these are mapped as stream-terrace deposits (Qst_2).

The next recorded ice-front position is in the Konkapot Valley about 2 miles north of the Massachusetts border and just south of Konkapot crossroads. Here a small ice block lay at the head of a kame terrace, kame (Qcd_3), outwash (Qo), and stream-terrace (Qst_3) sequence which extends uninterruptedly from an elevation of about 700 feet above sea level in a broad arc to the Housatonic Valley. Textures of this sequence of deposits decrease in size down valley from coarse gravel to sand, and collapsed and uneven bedding gives way to uncollapsed and even bedding. The downstream edge grades to a sandy, silty composite stream terrace in the Housatonic Valley, which in turn is graded to the Great Falls bedrock threshold near Falls Village, Conn. This relationship implies that during or before the deposition of this sequence, the main Housatonic Valley was drained of lake water, and stream-terrace deposits formed more or less concomitantly with the outwash deposits of the sequence.

As stated above, stream-terrace deposits were laid down in the Housatonic Valley while stagnant ice features formed in the tributary valleys. Some of these Housatonic deposits are complex. Their lower sections locally are lacustrine in origin, and the surface material, mostly sand, is derived from glaciofluvial material of various ages from the tributary valleys and from the upper Housatonic Valley in the Great Barrington and Stockbridge areas. Subsequently, these deposits were trenched about 20 feet. Stream-terrace deposits on minor streams are composed of gravel and, locally, boulder gravel and have been incised 10 to 20 feet.

Modern flood-plain alluvium (Qal), mostly silt and fine sand, was deposited in the Housatonic Valley after trenching of the stream-terrace deposits. Alluviation is a continuing process, as major floods every few decades inundate the flood-plain alluvium, reaching or barely exceeding the level of the stream-terrace deposits. As suggested by profile *A-A'*, net accumulation is minor, and downcutting is limited by the bedrock threshold at Falls Village, Conn. Along smaller streams, recent alluviation is minimal and is mostly confined to reworking of the stream-terrace deposits during major floods.

Organic deposits have developed in postglacial time in poorly drained areas, resulting in widespread but thin deposits of peat mixed with silt and clay-size material. Postglacial solution in carbonate rocks, such as on the west slope of Benton Hill, has formed sinks and solution-enlarged joints. Solution has also produced sinks and disappearing and reappearing streams in the area north of Brewer Branch Road.

Mass movement formed talus sheets on Toms Hill, small landslides on Rattlesnake Hill, and scattered talus blocks (unmapped) on the slopes of Canaan Mountain. Most of this material appears to be stabilized, and hence it probably was deposited during the waning phases of glaciation.

ECONOMIC GEOLOGY

The gravel and sand resources of the quadrangle can be conveniently separated into several groups according to origin and location. Delta deposits (Qd) near East Canaan consist of an estimated 47 million cubic yards of sand and 5 million cubic yards of gravel. Much of the gravel has been removed in the southern and eastern part of the deposit, primarily from the topset beds, but additional large supplies of gravel may occur in the northern part. The deposit contains about 5 percent silt, but the quality of gravel is otherwise high, consisting of more than 70 percent quartzite fragments. Pebble lithology of selected surficial deposits of possible economic value is summarized in the explanation and presented in more detail in table 1.

Water-laid ice-contact (Qcd) deposits occur mostly in the Konkapot drainage and include a broad kame terrace south of Konkapot crossroads and the kames at Mill River. Together these units contain an estimated 7 million cubic yards of sand and about 2 million cubic yards of gravel. Again, much of the desirable gravel in the upper part of the deposits has been removed. The percentage of silt is probably 5 percent or less, and the quality of gravel is fairly high; quartzite averages about 50 percent of the pebble and cobble fraction, and the carbonate rock percentage is very low.

Outwash deposits (Qo) occur in a broad fan which topographically extends from the Konkapot kame terrace into the main valley of the Housatonic River. This outwash has an estimated 17 million cubic yards of sand and about 2 million cubic yards of gravel. Here, too, much of the gravel has been removed at the pits, and exploitation is restricted by the water table and conflicts with other land use, such as agriculture. Quality of the gravel is high, quartzite averaging nearly 70 percent and silt composition about 2 percent.

Stream-terrace deposits (Qst) are very extensive; the surface material consists mostly of sand or silty sand. Gravel represents less than 10 percent of the deposit and consists mostly of small pebbles. Stream-terrace deposits have been used only where quality requirements are low, or where quantity and transport distance are cost factors. Moreover, much of the best agricultural land and many settlements are on stream-terrace deposits.

Till has been used for road fill in rare instances, and at one locality (near Canaan Valley) was used with weathered bedrock for dam fill. The abundance of sand and gravel generally precludes use of till except for special purposes, such as sealing pond basins or dams.

Clay resources are not now exploited, although potential use is high. Surface exposures along the Konkapot River northeast of Clayton were used in the past, and bedded clays occur in the streambank south of Konkapot crossroads. Well and auger data show that the thick, extensive clay of the Housatonic Valley occurs near the surface in the Sheffield area; this is also suggested by occurrence of clay at a pottery pit just north of the quadrangle boundary in Sheffield Town.

Peat is widespread, but quality is low, and the recoverable amount is generally small. However, it would be valuable locally for agricultural purposes, and excavation of the peat beds would provide certain benefits of land reclamation, such as the creation of recreation ponds.

TABLE 1. *Pebble lithology of selected surficial deposits (in percent)*

Delta deposits (Qd)

Locality	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Quartzite	76	76	69	70	66	65	71	68	82
Sandstone, conglomerate	1	2	7	0	6	3	4	2	3
Carbonate rock	2	7	4	2	5	6	5	4	4
Igneous rock	2	4	6	8	7	5	6	8	4
Gneiss	6	3	5	0	1	0	1	1	1
Schist	8	3	5	12	10	11	7	12	5
Quartz	2	3	0	4	2	5	3	3	0
Miscellaneous	3	2	4	4	3	5	3	2	1

Till (Qt)

Locality	(2)	(4)	(5)	(7)	(8)	(11)
Quartzite	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Sandstone, conglomerate	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Carbonate rock	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Igneous rock	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Gneiss	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Schist	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Quartz	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Miscellaneous	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Water-laid ice-contact deposits (Qcd)

Locality	(1)	(3)	(9)	(10)	(26)
Quartzite	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Sandstone, conglomerate	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Carbonate rock	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Igneous rock	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Gneiss	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Schist	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Quartz	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Miscellaneous	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Outwash (Qo) and stream-terrace (Qst_3) deposits

Locality	(6)	(21)	(22)	(23)	(24)	(25)
Quartzite	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Sandstone, conglomerate	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Carbonate rock	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Igneous rock	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Gneiss	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Schist	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Quartz	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Miscellaneous	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

ACKNOWLEDGMENTS

The authors are indebted to the Connecticut Department of Highways for some of the resource data; to Nicholas M. Ratcliffe and H. Robert Burger, U.S. Geological Survey, for data on bedrock, boulder trains, glacial striae, and karst features; and to Robert L. Melvin, U.S. Geological Survey, for subsurface information.

REFERENCES CITED

Norvitch, R. F., and Lamb, M. E. S., 1966, Housatonic River basin: U.S. Geol. Survey Massachusetts Basic-Data Rept. 9, Ground-Water Ser., 40 p.

Taylor, F. B., 1910, Richmond and Great Barrington boulder trains: Geol. Soc. America Bull., v. 21, p. 747-752.

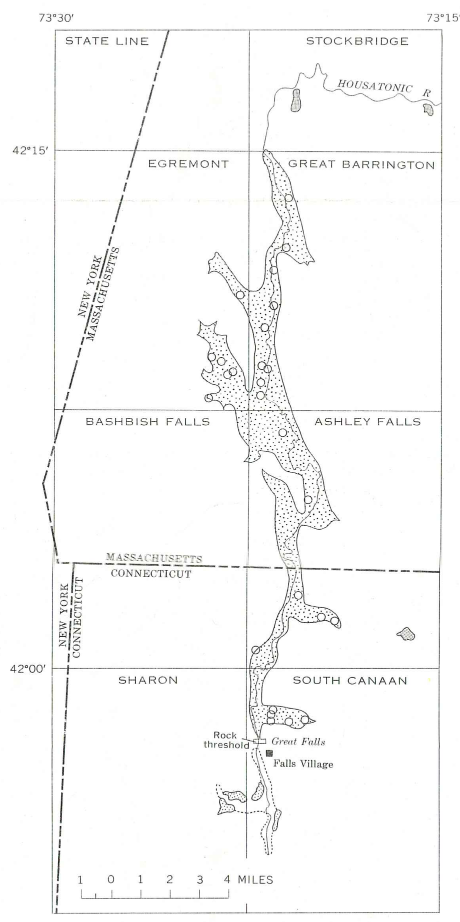


FIGURE 1.—*Sketch map showing regional relations of lacustrine deposits.*

Base by U.S. Geological Survey, 1958

SCALE 1:24 000

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

QUADRANGLE LOCATION

EXPLANATION

A layer of windblown silt and sand, locally mixed with frost-disturbed rock fragments, covers part of the surficial deposits but is not shown

Qal — Alluvium

Qf — Alluvial-fan deposits

Qs — Swamp deposits

Qcd — Water-laid ice-contact deposits

Qst — Stream-terrace deposits

Qd — Delta deposits

Qo — Outwash deposits

Ql — Lake-floor deposits

Qt — Till

Bedrock outcrop or area of closely spaced outcrops

Artificial fill

Contact

Strike and dip of foreset bedding in delta

Striation or groove

Summit of well-formed drumlin or drumlinoid hill

Spillway for glacial melt water or temporary glacial lake

Landslide

Talus

Areas of erratics from unique point sources

Karst features

Inferred shoreline of temporary East Canaan glacial lake

Textures: Clay-size material, Silt, Sand, Gravel, Boulders

Till-fabric locality

Pebble-count locality

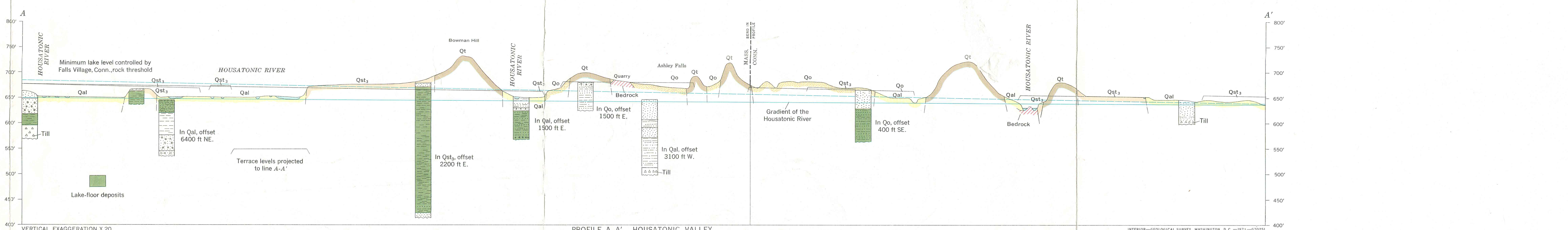
Stratigraphy of surficial material

Well or test boring

Auger hole or test pit

Construction materials pit

Holocene — Pleistocene — QUATERNARY



SURFICIAL GEOLOGIC MAP OF THE ASHLEY FALLS QUADRANGLE, MASSACHUSETTS-CONNECTICUT

By
G. William Holmes and Walter S. Newman

1971