

State of Connecticut

TWENTY-FIFTH BIENNIAL REPORT
OF THE COMMISSIONERS OF THE

STATE GEOLOGICAL AND NATURAL HISTORY SURVEY

1951-1952

Bulletin No. 82



HARTFORD

Printed by the State Geological and Natural History Survey

1953

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of Connecticut

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LETTER OF TRANSMITTAL

Hartford, Connecticut
February 1, 1953

His Excellency, John Davis Lodge,
Governor of Connecticut
Hartford, Connecticut

Sir:

I have the honor to transmit to you herewith on behalf of the Commissioners of the State Geological and Natural History Survey, in compliance with past custom, the twenty-fifth biennial report of the Survey, covering the two years ending December 31, 1952.

Respectfully submitted,

EDWARD L. TROXELL,
DIRECTOR

**TWENTY-FIFTH BIENNIAL REPORT
OF THE
GEOLOGICAL AND NATURAL HISTORY SURVEY
OF CONNECTICUT**

INTRODUCTION

The Connecticut Geological and Natural History Survey will be fifty years old in June, 1953. To quote the language from the first biennial report, "Three distinct aims should be regarded as the work of the Survey; first, that advancement of our knowledge of the geology, botany and zoology of the State as a matter of pure science; second, the acquisition and publication of such knowledge of the resources and products of this State as will serve its industrial and economic interests; third, the presentation of the results of investigations in such form as to be useful in the educational work carried on in the various schools of the State." These three aims, the purely scientific, the economic, and the educational have remained during its fifty years of existence as the primary purposes of the Survey. The Survey has never had full-time personnel. The Director and his secretary are part-time employees and the Commissioners serve without compensation. The investigations of the Survey are carried out by part-time workers. To January 1, 1953, eighty bulletins and five publications of the miscellaneous series had appeared. This list of publications represents an important contribution to the geology and natural history of the State. Considering the facts that the Survey has always operated with part-time personnel and with a very modest budget the record is an impressive one. But considered from the standpoint of the needs of a highly populated industrial area self-satisfaction is out of place. The President's Materials Policy Commission has emphasized the need for basic geology mapping and has pointed out that for the country as a whole not over 11% has been mapped geologically on a scale of 1 mile to 1 inch or larger. Only a very small part of Connecticut is covered by modern geologic maps on an adequate scale.

In reviewing the accomplishments of the last fifty years, it is obvious that the economic aim of the Survey has been less adequately cared for than the purely scientific and educational aims. In the future efforts should be made to make up some of this deficiency.

GEOLOGICAL RESEARCH

Geologic Map of the State. The geologic map published in 1906 has long been out of print and as indicated by its title it was "provisional." Dr. Reuben J. Ross compiled a map from existing data of the central part of the State in 1952. Dr. Cameron had already prepared a map of the Western Highlands and recently Dr. John Rodgers has agreed to compile the geology of the Eastern Highlands. It is expected to have by September a manuscript map of the geology of the whole State ready for publication. This map will represent another step in the progress of knowledge of the basic geology of the State, but the compilers have pointed out great deficiencies in our geologic data. The publication of this map should be a stimulus to detailed work upon which to base a much better map in years to come.

Geologic Quadrangle Maps. The publication of the first of the series of geologic quadrangle maps was announced in the last biennial report, Bulletin No. 79. This is part of a plan to make geologic maps of Connecticut on a scale of one half mile to the inch. At the present rate of progress it will take a long time to accomplish this purpose, but a start has been made. There should be two maps of each quadrangle, one showing the bedrock geology and the other, the surficial deposits. The index map on page 12 summarizes the progress to date showing the published maps for which the field work is essentially done and others which are in progress. The status of the individual quadrangles is briefly discussed below.

NEW PRESTON QUADRANGLE—(Misc. Series No. 5—The geology of the New Preston quadrangle by Dr. R. M. Gates and W. C. Bradley, with colored geologic map which also may be obtained separately.)

The New Preston quadrangle lies west of the Litchfield quadrangle previously mapped. It is underlain by igneous and metamorphic rocks which are covered locally by glacial deposits. The bedrock consists of hornblende and dioritic gneisses, schist, quartzite, dolomitic marbles, granite and granitic gneiss. In the northeast corner of the quadrangle norite and related rocks of the Mt. Prospect complex occur. These rocks have been described in Bulletin 76. Although the rocks strike northeast and dip to the northwest over most of the map area except in the northeast corner where they are much deformed, the oldest rocks are in the northwest and overlie the younger rocks to the southeast. This inverted relationship may be due to an overturned fold or thrusting.

The effects of glaciation are described. The movement of ice was dominantly in a direction S 20° E with a minor fluctuation S 2° E. Several drainage changes have resulted from the glaciation. A

black and white map shows the glacial features including the aqueo-glacial deposits which have been worked locally for sand and gravel.

WOODBURY QUADRANGLE—Dr. R. M. Gates completed the field work on the Woodbury quadrangle in 1952 and expects to submit his report and map for publication in June, 1953, before starting field work on the adjacent Roxbury quadrangle. The study of this area will make an important contribution to an understanding of the formation of the granite bodies of western Connecticut. It also furnishes important basic data for any mineral studies or for appraising water resources or planning engineering projects.

ROCKVILLE QUADRANGLE — Dr. Janet Aitken has completed the field work on the Rockville quadrangle and is preparing the map and report for publication. On the western margin of this quadrangle the Triassic rocks of the Central Lowland are separated from the crystalline rocks of the Eastern Highlands by a large fault which is covered by glacial deposits. But in spite of this glacial cover the fault has been rather closely delimited by detailed work. The map will add greatly to the knowledge of the distribution of rock formations and to an understanding of the structure of the crystalline rocks which underlie much of the quadrangle.

Sand and gravel are the chief mineral resources of the quadrangle though flagstone was formerly quarried near Bolton Notch.

ELLINGTON QUADRANGLE—Mr. Glendon Collins has mapped part of the Ellington quadrangle for a master's thesis at Brown University. It is planned to have him finish the mapping of the remainder of the quadrangle in June, 1953.

NEW MILFORD QUADRANGLE—The field work for a bedrock map of the New Milford quadrangle was completed in 1952 by G.V. Carroll. Dr. Carroll hopes to complete a report on the area by September, 1953.

The bedrock of the New Milford quadrangle consists of feldspathic gneisses, quartzites, dolomitic and calcitic marbles, mica schists, and mica quartzites. These rocks appear to be compressed into an anticlinorium of fan fold type, broken by steep faults. This structure is of special interest with regard to the geology of western Connecticut as a whole because it separates terranes that differ in lithology and structure; on the east, a wide expanse of the Hartland formation has folds overturned to the east; on the west, diverse Pre-Cambrian and Cambro-Ordovician metasedimentary rocks are folded and overturned in the opposite direction. The relation of the anticlinorium in the New Milford quadrangle to structures on the east and west serves also to place limits on many speculations about the role of overthrusting in the orogenic history of westernmost Connecticut and adjacent parts of New York state.

Attention will be drawn to materials, particularly marbles, that have potential industrial value.

SOUTH COVENTRY QUADRANGLE—Dr. Janet Aitken has largely completed the field work on the South Coventry quadrangle and will complete her map and report on this quadrangle after the completion of the Rockville quadrangle.

GLASTONBURY QUADRANGLE — Dr. Norman Herz completed the field work on the Glastonbury quadrangle during 1951, but he left for Greece immediately afterward and has been unable to complete his map and manuscript for publication. He hopes to complete the manuscript and map by July, 1953.

GUILFORD QUADRANGLE—Drs. Mikami and Digman have as yet been unable to complete their manuscript on the Guilford quadrangle but it is hoped that they can do so in the near future.

Other Geological Projects

TRIASSIC LIFE OF CONNECTICUT—The report by Dr. R. S. Lull on the Triassic Life of Connecticut is being printed and it is expected that it will be available for distribution as Bulletin 81 in May, 1953. This will be an important contribution to an understanding of the dinosaurs and other forms which lived in the Connecticut Valley in the Triassic period. It will be well illustrated and will be useful both as a scientific contribution and for educational purposes.

GEOLOGY OF THE PRESTON GABBRO—Dr. Charles B. Sclar has promised to submit his revised manuscript on the Preston Gabbro for publication within the coming biennium. This is an important contribution to the basic geology of southeastern Connecticut.

BIOLOGICAL RESEARCH

Botanical Investigations at the Connecticut Arboretum. Three lines of work on the Connecticut flora now in progress at Connecticut College have been supported during the biennium. The first of these has been further collection of living specimens of native trees and shrubs to be added to the Arboretum plantings. This work has been done by Mr. K. P. Jansson. The extensive collection of native blackberries and brambles, belonging to the genus *Rubus*, has received intensive study by Dr. Katherine Heinig, who has been determining chromosome numbers and cytological behavior in an attempt to clarify relationships in this notoriously difficult group. This work is not yet ready for publication.

In 1952 one hundred acres of the Arboretum woodland were set aside as a "natural area"—an exhibit of wild land where plants and animals are left completely undisturbed, but available for scientific study, and for cultural and educational purposes. A long-range

study of the flora of this area has been undertaken in order to record the changes which may occur in the vegetation within the next century. The Survey has given initial support to this project by financing the beginning of a careful field survey which was carried out by Connecticut College students under the direction of Commissioner Goodwin.

Entomological Publications. The Survey has encouraged research in entomology largely through sponsoring the publication of the "Guide to the Insects of Connecticut." Manuscripts on various groups have been prepared by world authorities at no expense to the State and have then been published with funds in the Survey budget. We have been fortunate in having the assistance of Dr. Charles L. Remington of the Department of Zoology at Yale University in arranging for the preparation of new manuscripts and in other editorial matters pertaining to this series. He replaces Dr. Roger B. Friend of the Connecticut Agricultural Experiment Station, who served in this capacity for a number of years.

Fascicle V of the Diptera appeared during this biennium as Bulletin No. 80 and Fascicle VI, dealing with the gall midges (Itonididae) is essentially ready for publication. Arrangements are now being made for the preparation of Fascicle VII, which will complete the treatment of the suborder Nematocera. It is proposed that subsequent parts to the guide be prepared on the Myriapoda and the butterflies (Lepidoptera).

Bulletin No. 80. Midges and Gnats, by O. A. Johannsen, Henry K. Townes, Frank R. Shaw and Elizabeth G. Fisher. This publication represents the fifth fascicle of part VI on the Diptera or true flies in the distinguished series of monographs started by Dr. W. E. Britton in 1911 with Bulletin No. 16 under the title "Guide to the Insects of Connecticut." The insects considered in this newest addition to the series include: the midges belonging to the family Tendipedidae (Chironomidae) which may have their greatest importance as a part of the food chain in our lakes and streams; the "punkies" or "no-seeums" belonging to the family Heleidae (Ceratopogonidae), many species of which are only too well known for their minute size, blood-sucking habits and irritating bite; and the fungus gnats belonging to the family Fungivoridae (Mycetophilidae), insects living on fungi on or in decaying vegetation and humus. The treatment of these insects has been prepared by internationally known specialists and includes descriptions of the species found in Connecticut together with drawings of diagnostic parts and keys to their identification.

Studies on Small Mammals. The studies undertaken by Dr. Bernice M. Wheeler of Connecticut College on the species status of the Block Island field mouse, *Microtus provectus*, which were supported by the Survey during the previous biennium, have reached the stage where some conclusions may be drawn. These have appeared as a brief note in volume 6 of the journal "Evolution". The larger Block Island mice have, in a few instances, been successfully bred in the laboratory with the smaller mainland mice, indicating a lack of genetic isolation between these strains. These results suggest that the Block Island mice should not enjoy the status of separate species. Further anatomical studies are still in progress.

MISCELLANEOUS

Highway Cores

Due to the fact that the Old Opera House at East Haddam is to be sold, a new storage place of the Highway Department cores has to be obtained. President Jorgensen has agreed to make space available at the University of Connecticut. It is expected that the cores will be moved in the spring of 1953. This core library should be of increasing value as it becomes larger. It will be important to have the material indexed as it is received.

New England-New York Interagency Committee

From April, 1951, to September, 1952, Commissioner Peoples served as representative of the U. S. Geological Survey, and coordinator of the Mineral Resource Study and Report Group. He resigned as coordinator in September, 1952, but has continued to serve as a representative of the Connecticut Geological and Natural History Survey. Mr. Coburn of the State Planning Commission has also represented Connecticut on the Mineral Resource Study and Report Group.

50th Anniversary

The annual meeting of the Association of State Geologists will be held in Hartford in September, 1953, in honor of the 50th Anniversary of the Survey. Field trips are being planned to show the visiting geologists some of the geological features of Connecticut.

A meeting is planned in May to review the accomplishments of the Survey in the field of biology during the first half century. A panel will also discuss the functions and program of the Survey for the future.

Mineral Resources of Connecticut

The problem of mineral raw materials has been placed prominently before the people with the publication of the report of the President's Materials Policy Commission in June 1952. This report

among other things, has pointed out the deficiency of the country as a whole in basic mapping. It has also pointed out the effects of changing technology on raw materials.

It is abundantly clear that the knowledge of the basic geology of New England is not as well known as is generally assumed, and, therefore, at this stage no final appraisal of mineral resources can be made. New England is lacking in mineral fuels unless research can demonstrate ways of using peat and/or Rhode Island coal economically.

Most of New England's mineral potential is in the non-metallic field which everywhere is expanding. Connecticut's chief mineral products from the point of view of value are clay products, stone, sand and gravel, lime, feldspar and in recent years magnesium has been produced. Production of mica is starting up again. Connecticut has important pegmatite deposits which have produced feldspar and mica in the past. They have been mapped by the Federal Geological Survey and it is hoped the published report will soon appear. Further studies may be needed in the future. Research is developing uses of minerals which were never used a few years ago and new uses for other minerals. The materials in Connecticut which need study are the carbonate rocks (the marbles) of western Connecticut, the varved clays of central Connecticut, shales which might be suitable for bloating shales, for lightweight aggregate and various minerals such as kyanite and sillimanite which are used in the ceramic industries. This is an age of research and Connecticut is far behind in research on its mineral raw materials.

RECOMMENDATIONS

1. It is very important that studies be published promptly and therefore an increase in appropriation is requested to publish the reports listed in the appendix.

2. It is recommended that mapping of the geology of the State by 7½ minute quadrangles be continued, that surficial as well as bedrock maps be made.

3. Since the field work and publication of the bedrock geology of a quadrangle costs about \$5000 and there are about eighty quadrangles in the State a twenty-year program to complete the bedrock mapping of the State would cost about \$20,000 per year and surficial mapping would cost at least as much. It is recommended that the budget of the Survey be materially increased and that consideration be given to a cooperative mapping program with the U.S. Geological Survey.

4. It is recommended that the budget of the Survey be increased to permit the hiring of a full time geologist to devote most of his time to accumulating data for studies of economic and engineering geology.

INDEX MAP OF CONNECTICUT
SHOWING PROGRESS OF BED ROCK MAPPING

1. Litchfield Quadrangle. Misc. Series No. 3, 1951.
2. New Preston Quadrangle. Misc. Series No. 5, 1952.
3. New Milford Quadrangle. Field work completed, 1952.
4. Woodbury Quadrangle. Field work completed, 1952.
5. Glastonbury Quadrangle. Field work completed, 1951.
6. Guilford 15' Quadrangle. Field work completed.
7. Rockville Quadrangle. Field work completed, 1952.
8. Oneco and Voluntown Quadrangles. Field work completed, 1951.
9. Ellington Quadrangle. Field work in progress, 1953.
10. South Coventry Quadrangle. Field work nearly completed.
11. Pegmatite area mapped by U.S.G.S.
12. Preston Gabbro Area. Field work completed.

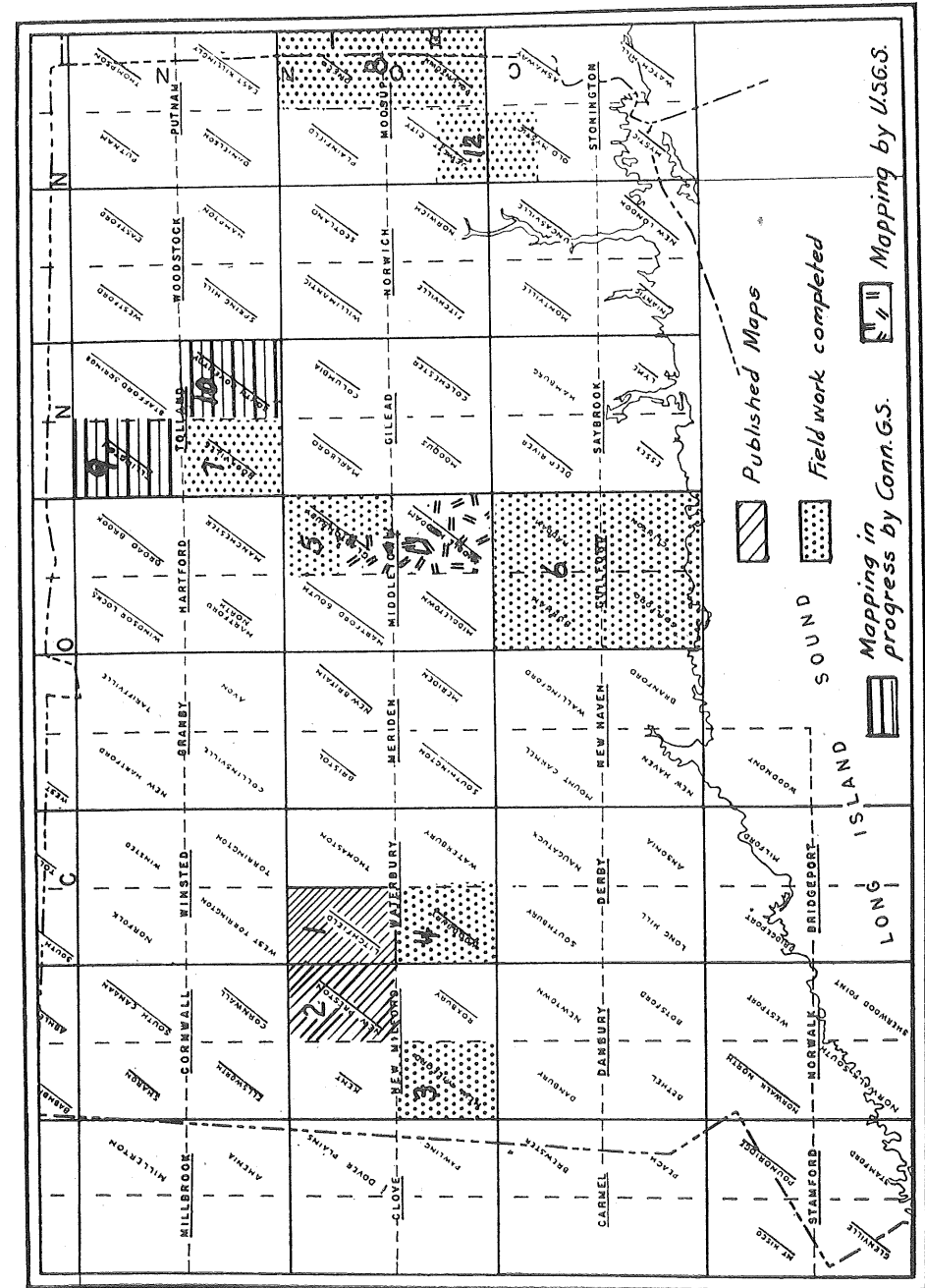


FIGURE 1. INDEX OF CONNECTICUT