# State of Connecticut

TWENTY-SIXTH BIENNIAL REPORT
OF THE COMMISSIONERS OF THE

# STATE GEOLOGICAL AND NATURAL HISTORY SURVEY

1953-1954

**Bulletin No. 83**

STORRS

Printed by the State Geological and Natural History Survey

1955

# Twenty-sixth Biennial Report of the Commissioners

OF THE

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# State Geological and Natural History Survey of Connecticut

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## LETTER OF TRANSMITTAL

Storrs, Connecticut
February 1, 1955

His Excellency, Abraham A. Ribicoff
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-sixth biennial report of the Survey, covering the two years ending December 31, 1954.

Respectfully submitted,

JOHN B. LUCKE
*Director*

# TWENTY-SIXTH BIENNIAL REPORT
# OF THE
# GEOLOGICAL AND NATURAL HISTORY SURVEY
# OF CONNECTICUT

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## INTRODUCTION

**Objectives of the Survey.** The Connecticut Geological and Natural History Survey has three inter-related functions, namely: scientific, economic and educational. The first involves study of the geological and biological make-up of the State and the preparation of scientific reports by experts in one or more branches of these sciences. With respect to geology, this involves the determination of the order, succession, composition, and comparative magnitude of the various strata or geological formations within the State; to discover and describe all beds or deposits of mineral and fossil content and to prepare detailed geologic maps, both of the underlying bedrock and all unconsolidated surface deposits.

With respect to biology, this same general objective has been met by exhaustive studies on animal and plant groups, such as spiders, mosquitoes, fish, mammals, flowers and plants of Connecticut.

The economic objectives include the determination of the probable value and extent of ores, clays, rocks, surface and ground waters, and any other mineral substances as may be useful or valuable, and to prepare reports thereon. This applies with equal validity to those animals or plants whose activities or utilization affect the economy of the State.

The educational functions are primarily the publication and wide dissemination of the kinds of information accumulated. Outside of scientific maps and reports, the Survey carries on a constant information service by identifying specimens, answering questions from individual citizens or other State agencies, with regard to all items that fall within the geological or biological sciences, and especially assisting teachers and pupils in the schools in answering such questions.

## SURVEY PERSONNEL

There are no full-time employees of the Survey. The Director and a part-time Secretary have an office at 114 Holcomb Hall at the University of Connecticut. The Commissioners serve without remuneration and direct the activities of, in the past biennium, some fifteen scientists who are employed on a part-time basis, largely in the summer months. In addition, the Survey maintains part-time consultants to advise on bedrock geology, glacial geology and entomology.

During the past biennium, Dr. Edward L. Troxell, who had been Director for fourteen years, retired from both the Survey and the Department of Geology at Trinity College. He was succeeded by Dr. John B. Lucke, Professor of Geology at the University of Connecticut, and the Survey office

was transferred to the latter institution in April, 1954. Dr. Chester R. Longwell, Professor of Geology at Yale University, resigned from the Commission and was succeeded by Dr. G. Evelyn Hutchinson, Sterling Professor of Biology at Yale. Dr. Arthur H. Hughes, Dean of Trinity College, also resigned from the Commission and was succeeded by Dr. Randolph W. Chapman, Professor of Geology at Trinity College.

## FIFTIETH ANNIVERSARY

The Survey had its Fiftieth birthday in June, 1953. This was signalized first, by a biology symposium held in May at Connecticut College, New London, under the chairmanship of Commissioner Goodwin. The following October, the Association of State Geologists held its annual meeting at Trinity College to commemorate the Semi-Centennial anniversary.

## NEW OBJECTIVES AND STATE SERVICE

The major activity of the Survey since World War II, in line with the general objectives previously mentioned, has been the systematic mapping of the geology of the State, quadrangle by quadrangle, in accord with the United States Geological Survey system of topographic mapping. Because of the part-time nature of the experts employed to pursue this program in the past, it has proceeded at a rate far too slow for modern industrial needs. At the invitation of the Chief Geologist of the United States Geological Survey, Connecticut was encouraged to embark on a program of cooperation between the State and that organization. Such a cooperative agreement has been in effect for years in Massachusetts and Rhode Island, with the result that both these neighboring states have far out-stripped Connecticut in available information and, under the cooperative system, half of the total cost has been paid for by the Federal government. The advisability of establishing such a method of accelerating the detailed mapping in Connecticut has been explored since the present Director took office.

The usefulness of detailed geologic maps to the general citizenry, but also to sister State agencies, was determined at a meeting in Hartford in August, 1954. The following attended: Dr. John B. Lucke, Director, Connecticut Geological and Natural History Survey; Dr. G. Albert Hill, Commissioner, State Highway Department; Mr. Craig Belcher, Assistant Highway Engineer, State Highway Department; Mr. James Brewster, State Librarian; Mr. William S. Wise, Director, State Water Commission; Dr. James Horsfall, Director, Connecticut Agricultural Experiment Station; Mr. Thaddeus Burak, Soil Conservation Division, Connecticut Agricultural Department; Mr. Paul D. Collier, Chief, Bureau of Youth Services, Connecticut Department of Education; Mr. I. L. Newell representing the State Board of Registration for Professional Engineers and Land Surveyors; Mr. Sidney A. Edwards, Managing Director, Connecticut Development Commission; Mr. Elmer R. Coburn, Assistant Director, Mr. LeRoy Jones, Chief, Industrial Development Division, Mr. James S. Klar, Planning Engineer, Mr. William Blakey, Planning Engineer, Mr. Lee L. Harding, Field Engineer and Mr. Lloyd J. French, Industrial Research Association, all of the Connecticut Development Commission.



It was the unanimous consensus of the group that (1) detailed geologic maps of Connecticut are of incalculable value to a wide variety of individuals and organizations; (2) in order to pursue the completion of the detailed quadrangle geologic maps within the foreseeable future, the State would be well advised to enter into a cooperative agreement with the United States Geological Survey under which the latter would prepare detailed maps and render such other geologic advice to the State as might be required, at a cost to the State of but one-half the total cost. The suggestion was made that an annual contribution, by the State, of $50,000 would, in ten years' time, result in approximately 80 per cent completion. The United States Geological Survey, however, was unable to assign to Connecticut, on short notice, such a large number of its personnel as would be required by this figure. Consequently, in the coming biennium, a more modest start—an annual expenditure of $20,000 is proposed in accordance with the personnel available to the United States Geological Survey in the next biennium. If the long-range objective of a complete set of bedrock and surficial geologic maps is to be met within a reasonable period of something like the next decade, it is clear that this annual contribution to such a cooperative agreement will have to be increased in the future biennia. Such changes can well be made by mutual agreement between the State Survey and the United States Geological Survey after the cooperative mapping program has begun.

## PUBLICATIONS IN THE LAST BIENNIUM

1. Bulletin No. 81, Triassic Life of the Connecticut Valley (revised), by Richard Swann Lull, Ph.D, Sc.D., was published in 1953.
2. Quadrangle Report No. 3, The Bedrock Geology of the Woodbury Quadrangle, with map, by Robert M. Gates, Ph.D,. was published in 1954.
3. Quadrangle Report No 4, The Bedrock Geology of the Ellington Quadrangle, with map, by Glendon E. Collins, was published in 1954.

   These are available on application to Mr. James Brewster, State Librarian, Distribution and Exchange Agent, State Library, Hartford 1, Connecticut.
4. Quadrangle Report No. 5, The Bedrock Geology of the Glastonbury Quadrangle, with map, by Norman Herz, Ph.D., is in press.
5. Quadrangle Report No. 6, The Bedrock Geology of the Rockville Quadrangle, with map by Janet M. Aitken, Ph.D., is in press.
6. The Surficial Geology of the Middletown Quadrangle, with map, by Roy E. Deane, Ph.D., has been completed but will be published in a larger bulletin embracing the adjoining Hartford South, Glastonbury and Middle Haddam quadrangles, the mapping of which is in progress.

## GEOLOGICAL WORK IN PROGRESS

**Bedrock Geology.** (Quadrangles named herein can be identified by reference to the Index Map on the last page.)

The Danbury Quadrangle, map and report, by James G. Clarke, is very nearly completed. In the coming summer, Dr. Clarke will compile the map of the adjoining Bethel Quadrangle.

The Roxbury Quadrangle, map and report by Robert M. Gates, is nearing completion.

The New Milford and Kent Quadrangle maps and reports by Gerald V. Carroll, are at an advanced state of progress.

The Middletown Quadrangle will be begun in June, 1955, by Elroy P. Lehmann and an assistant.

The Connecticut portions of the Brewster and Peach Lake Quadrangles will be begun in June by Robert M. Sneider.

The Deep River Quadrangle will be undertaken in June by Lawrence W. Lundgren, Jr.

**Surficial Geology.** The surface deposits of the Hartford-South Quadrangle will be completed next summer by Roy E. Deane, who will then proceed to the Glastonbury and Middle Haddam sheets in accord with the plan cited above under Publications.

**General Geology.** A preliminary small-scale geologic map of Connecticut is in preparation. General reports on the Mineral Resources of Connecticut and Ground Water Resources of Connecticut are planned for the coming biennium.

The acceleration of geologic mapping, by means of the cooperative agreement with the United States Geological Survey, is in the hands of that organization which will begin work as soon as possible after budgetary approval is granted in 1955.

## AUXILIARY SERVICES

A collection of rock cores was deemed an important service which the Survey established in 1953, with the cordial cooperation of the Highway Department. This core library is now housed on the University of Connecticut campus at Storrs, and a complete file is kept for the general use of the citizens of the State who are concerned, for any reason, with foundation materials. Any industrial or other organization which has occasion to drill, or cause to be drilled, cores of the bedrock geology, is invited to place them on file with this State core library for general use in the future.

The attractively boxed suites of thirty-six labeled specimens of rocks and minerals of Connecticut, which were prepared by the Survey in 1949 for distribution primarily to schools, with an accompanying printed guide, have been exhausted. This has been an educational service in great demand and will be renewed as soon as budgetary restrictions are eased.

## BIOLOGICAL CONTRIBUTIONS

The Survey continued its support of the long-range vegetation study in the Natural Area of the Connecticut Arboretum, which was initiated in 1952. The vegetation has been mapped in detail on four twenty-foot wide east-west transects traversing the Natural Area. The habitats involved include natural oak forest, second growth, moist ravine, red maple swamp, open bog, rocky ledges and abandoned fields. Photographic records in kodachrome and black-and-white have been made from permanently marked photo stations along the transects. Every effort has been made to put the data in permanent form. It is hoped that periodic re-study of these transects will reveal the dynamic forces at play in these communities.



Mr. K. P. Jansson has nearly completed a detailed set of maps of the woody collections which will be most useful as an aid in keeping the plantings properly labeled and in keeping records of the specimens. Many native species, new to the Arboretum, have been successfully established. All of these botanical studies have been under the direction of Commissioner Goodwin. In addition, a breeding bird census has also been taken as an initial step in describing one portion of the animal population.

**A Natural Areas Program for Connecticut.** As an outgrowth of a recommendation from the participants of the biology symposium commemorating the Fiftieth Anniversary of the Survey, a Committee on Natural Areas was established under the chairmanship of Commissioner Goodwin. This Committee sponsored an open meeting in New Haven in November, 1953, to formulate a program for the establishment and preservation of areas throughout the State where the vegetation and wild life will be left undisturbed by man. The sponsorship of this Committee was taken over in the spring of 1954, by the Connecticut Forest and Park Association, thought to be the most appropriate agency to carry out this program, and the work of the Committee has been progressing well. This is an important and much needed move toward the conservation of our biological resources in a heavily-populated State.

Studies undertaken by Dr. Bernice M. Wheeler, of Connecticut College, with support from the Survey, have now been completed on the species status of the Block Island field mouse, *Microtus provectus*. The mice on Block Island were given species status by Bangs, partly because they were thought to be "giant" in relation to their mainland neighbors, *Microtus pennsylvanicus*. A statistical analysis of size difference does not indicate that a separate species for the Block Island mice is justified. This confirms tthe conclusions drawn from breeding experiments previously reported.

**Entomology.** Bulletins already in print on The Diptera of Connecticut (Fascicles I, II, and V), have covered the families of Tipulidae, Anisopodidae, Trichoceridae, Tanyderidae, Culicidae, Heleidae, Tendipedidae, and Fungivoridae. Out of sequence, a few families of Brachycera (Asilidae, Phoridae, and Tabanidae) were the subjects of Fascicles III and IV.

The manuscripts for Fascicle VI, on the Itonididae or Gallmidges, are on hand—a new one on the sub-family Lestremiinae by Dr. A. E. Pritchard, Berkeley, California, and a very old one on the other itonidids by the late E. P. Felt. The Felt manuscript is being modernized by the Entomological Editor, and when this has been completed, Fascicle VI will go to press.

In Fascicle VII, we will finish the primitive sub-order of the Diptera, the Nematocera. The preparation of this fascicle has been arranged with the several leading authorities of these families, and most of the manuscripts are nearly complete. That for the Bibionidae has already been received from Dr. Hardy. This fascicle with deal with several small families. The Simuliidae (Black-flies) are the responsibility of Dr. Alan Stone of the United States National Museum; Dr. Stone has made a point of collecting in Connecticut during the last two summers. The Bibionidae (March-flies) are being reviewed by Professor D. Elmo Hardy of the University of Hawaii. The Psychodidae (Moth-flies) are being treated by William F. Rapp, Jr., of the Nebraska Department of Health. The Blepharoceridae and the Deuterophlebiidae will be written up by Professor C. P. Alexander of the University of Massachusetts.

Bulletins on the Myriapoda, the butterflies (Rhopalocera), the Apterygota, and the Arachnida are planned. Work on the manuscripts will be started successively, about two years before the respective tentative publication dates.

Investigations on entomology are under the direction of the Entomological Editor, Dr. Charles L. Remington.

**Archeology.** In 1954, the Survey extended support to Mrs. Eva M. Butler for preparation of a report on southern New England as the settlers found it, together with the Indian use of land and trees, specifically in southeastern Connecticut. The report is still in progress, but will prove of wide interest to archeologists, anthropologists and foresters.

**Ecology.** An investigation of Late Wisconsin stratigraphy and ecology in southern New England, by Miss Estella B. Leopold, was supported by the Survey in the past biennium. This study, combining geology and botanical phases of the glacial deposits of Connecticut, is also in progress but will be extremely valuable in increasing our knowledge of the chronology of the events of the last glaciation in Connecticut.

## FUTURE PROSPECTS

**The 1955-57 Biennium.** In view of the consensus of sister State agencies, the United States Geological Survey and many business and professional citizens, the basic geologic mapping urgently needs to be pursued at an accelerated rate. Based on trained personnel now available to the State Survey, funds requested for field work and publication of geologic maps are approximately double those of the last biennium.

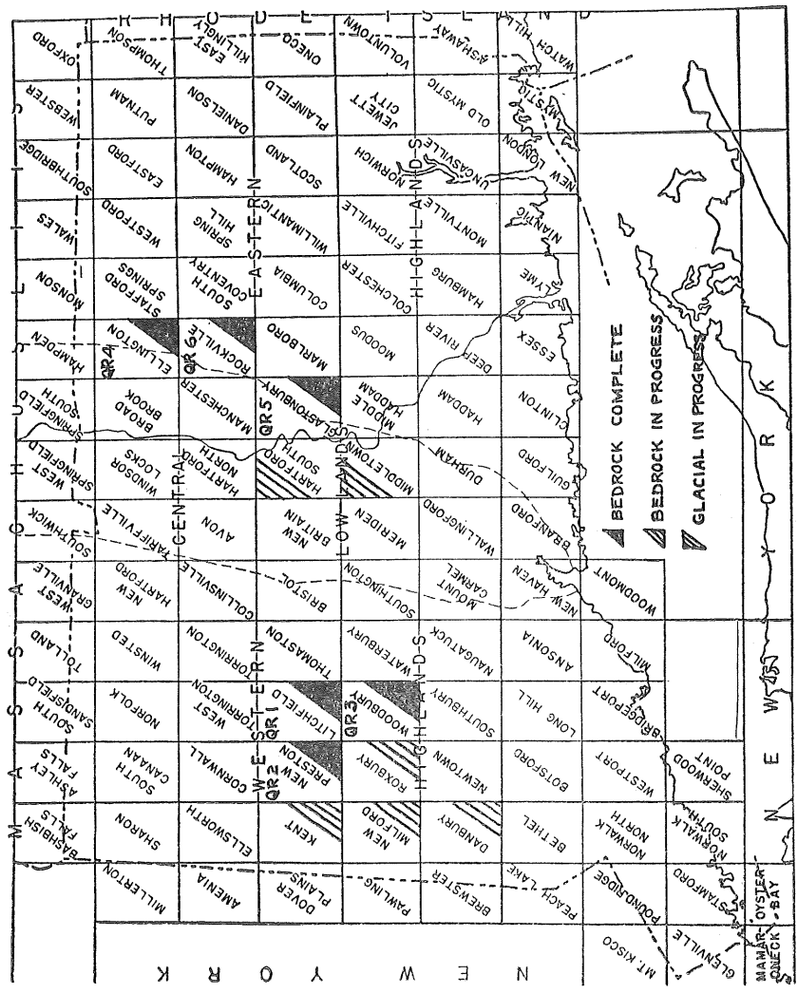
In addition, in order to approach the same objective, the State is asked to contribute $20,000 per year as its *half* of a cooperative mapping project to be pursued by personnel of the United States Geological Survey in Connecticut, similar to the programs already far advanced in Massachusetts and Rhode Island.

Functions of the Survey, such as biological and other research, educational and advisory services, will be maintained as before with no appreciable anticipated increase in funds.

**The Long View.** In the years after 1957, further increases in staff and budget will be needed if the statutory objectives are to be met without undue delay. The University of Connecticut, which provides a rent-free office, has assigned much larger space to the Survey upon completion of its new Physics-Chemistry Building, about 1957. At that time, it is highly likely that at least one full-time geologist will be needed to assist the Director.

If the first biennium's experience (1955-57) with a cooperative mapping program carried out by the United States Geological Survey proves as successful as anticipated, the annual expense to the State should be raised to perhaps $50,000. in order to provide for the rapid (about ten years) completion of this vital compilation of basic data. Geologists, engineers, agriculturists, conservationists, industrialists, utilities, railroads, city planners, realtors, bankers, teachers, students and just plain John and Mary Doe are increasingly aware of the long-unfilled need for these data in Connecticut, particularly in comparison with neighboring states.



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