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SIXTEENTH AND SEVENTEENTH BIENNIAL REPORTS OF THE COMMISSIONERS

OF THE

State Geological and Natural History Survey

1933-1936

Bulletin No. 59



HARTFORD

PUBLISHED BY THE STATE

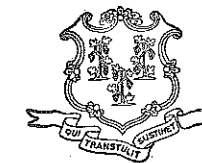
1937

State of Connecticut
PUBLIC DOCUMENT No. 47

State Geological and Natural History Survey

W. E. BRITTON, Ph. D., D. Sc., Superintendent

Bulletin No. 59



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HARTFORD

Printed by the State Geological and Natural History Survey

1937

State Geological and Natural History Survey
of Connecticut

COMMISSIONERS

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JAMES ROWLAND ANGELL, President of Yale University

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KATHARINE BLUNT, President of Connecticut College for Women

SUPERINTENDENT

W. E. BRITTON, Ph. D., D. Sc.

Agricultural Experiment Station, New Haven

DISTRIBUTION AND EXCHANGE AGENT

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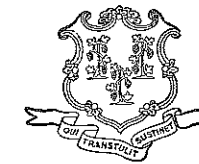
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LETTER OF TRANSMITTAL

New Haven, Conn., January 22, 1937.

His Excellency, Wilbur L. Cross,
Governor of Connecticut,
Hartford, Connecticut.

Sir:

I have the honor to transmit to you herewith, in behalf of the Commissioners of the State Geological and Natural History Survey, for the General Assembly, as required by Section 2229 of the General Statutes, the sixteenth and seventeenth biennial reports of the Survey, covering the four years ending December 31, 1936.

Respectfully submitted,

W. E. BRITTON,
Superintendent.

SIXTEENTH AND SEVENTEENTH BIENNIAL REPORTS
OF THE GEOLOGICAL AND NATURAL HISTORY
SURVEY OF CONNECTICUT

W. E. BRITTON, Ph. D., D. Sc., Superintendent

Because of the stringent financial conditions prevailing in 1933, the General Assembly of that year felt it was necessary to economize and therefore omitted from the budget the usual appropriations of a few of the state commissions whose activities, in the opinions of the legislators, would least affect the welfare of the State. Although the Superintendent was not consulted in the matter, the appropriation for the Geological and Natural History Survey was eliminated for the biennial period from July 1, 1933, to June 30, 1935. Consequently all work had to stop. No salaries, expenses, or other bills could be paid during this period because there was no appropriation.

However, the lack of appropriation did not stop the letters of inquiry from being sent to the office. Because of the great lack of employment, many men became interested in the old mines and mineral sites previously abandoned, presumably thinking that they might obtain a small income through their efforts in collecting minerals or working the old mines. Consequently there were an increased number of inquiries on the subject. It seemed only proper that most of these letters should be answered.

From the unexpended balance, a supply of postage stamps and printed post cards explaining the lack of funds was obtained prior to June 30, 1933. With the help of the stenographers in the Department of Entomology of the Agricultural Experiment Station, we were able to answer most of these letters.

Although Section 2229 of the General Statutes provides that a report showing the progress and condition of the Survey be prepared and presented to the General Assembly before each meeting, Governor Cross advised by letter that this would not be necessary for the General Assembly of 1935, as the appropriation had been eliminated. Consequently the present report is called the Sixteenth and Seventeenth Biennial Reports in order to cover all of the 34 years since the Survey was established. Otherwise the reader might think that these biennial reports cover only a portion of this time.

GEORGE SEYMOUR GODARD

George Seymour Godard was born in Granby, June 17, 1865, and died in Hartford, February 12, 1936.

Mr. Godard was graduated from Wesleyan University in 1892, and from Yale Divinity School in 1895. He received the honorary degree of Master of Arts from Wesleyan in 1916, and from Trinity College in 1919, and Doctor of Letters from Wesleyan in 1935.

He was appointed assistant to the State Librarian in 1898, and, after Mr. Hoadley's death in 1900, was appointed State Librarian, a position in which he continued until his death.

The State Geological and Natural History Survey was established in 1903. From the beginning Mr. Godard served as the Distribution and Exchange Agent of the Survey, and he effected exchanges with other state surveys and important scientific and reference libraries in the United States and many foreign countries. This arrangement resulted not only in placing the bulletins of this Survey in such libraries where they would be of great value, but in return the State Library, which is the repository of the Survey, procured many valuable publications which otherwise would have been impossible to obtain.

Although he had known Mr. Godard for 30 years, after the writer became Superintendent of the Survey in 1925, he was in closer touch with him through constant correspondence and frequent conferences over Survey matters. Mr. Godard was always most helpful and cooperative, and ever made all reasonable efforts to aid each one in obtaining the information he or she desired.

As State Librarian, Mr. Godard rendered outstanding service to the State and the Nation in the preservation of the early Colonial records and the records of towns, church and other societies, and genealogical, historical and military records, indexing them for ready reference.

Mr. Godard served as a Trustee of Wesleyan University from 1919 until his death. He was a member of many library, historical and patriotic organizations, president, National Association of State Librarians, 1904-1905; Connecticut Library Association, 1906-1907, and American Association of Law Libraries, 1909-1911; member, American Library Association; American Library Institute; American Historical Association; Connecticut Historical Society; New England Historical and Genealogical Society; Founders and Patriots of America; Connecticut Society, Sons of the American Revolution; (president 1926-1928) Connecticut Society of Colonial Wars, and the Connecticut Society of Cincinnati. He was editor of the Connecti-



George Seymour Godard

cut State Records from 1901; in charge of Connecticut State Military Census, from 1917; chairman, Commission on Historical Records, Connecticut State Council of Defense, 1918-1919; director, Connecticut Department of War Records from 1919; chairman, Connecticut Sesquicentennial Commission, Philadelphia, 1926.

Mr. Godard presented many papers and addresses before public meetings on bibliographical, historical, genealogical and patriotic subjects. The beautiful State Library and Supreme Court Building with its wonderful collections and equipment is largely the results of his persistent efforts, and will stand as a monument to his memory. May the systems and methods that he inaugurated and developed, be continued for the benefit of the people.

RECENT BULLETINS

During the four-year period covered by these reports, five bulletins have been published, which may be described, briefly, as follows:

Bulletin No. 52. Fifteenth Biennial Report of the Commissioners of the State Geological and Natural History Survey, 1931-1932. This is a report of progress and mentions four bulletins recently published, gives a list of manuscripts on hand, cites investigations in progress, other investigations needed, gives a list of all bulletins published and their classification according to subjects, method of distribution, inventory of Survey publications, the law establishing the Survey, financial statements and appropriations. 24 pages, 1933.

Bulletin No. 53. The Reptiles of Connecticut, by George H. Lamson. This bulletin gives general information about the snakes and turtles, with keys to each group, and descriptions and habits of 15 species of snakes, one lizard, and 13 species of turtles. 35 pages, XII plates, 1935.

Bulletin No. 54. The Mammals of Connecticut, by George G. Goodwin. This bulletin gives an idea of the classification of mammals, with much detailed information regarding the appearance and habits of 101 species, including the seals, whales and dolphins. 221 pages, 19 figures, XXXIII plates, 1935.

Bulletin No. 55. The Petrology of the Prospect Porphyritic Gneiss of Connecticut, by Lincoln Stewart. This bulletin contains a geological description of the peculiar rock formation that extends in a narrow strip from Fairfield in a northeasterly direction to Marion, and called the Prospect Gneiss. 40 pages, 1 figure, 1 folded map, VIII plates, 1935.

Bulletin No. 56. Marbles and Limestones of Connecticut, by Fred H. Moore. This bulletin contains a discussion of the geologic relations, origin and character of marbles and limestones, together with detailed descriptions of marble localities in the State. It also gives several chemical analyses, production and uses of marble and limestones, a publication that has long been needed. 56 pages, XIV plates, 1935.

UNPUBLISHED MANUSCRIPTS ON HAND

Several manuscripts are now on hand. Some are complete and ready for publication. Others require additional work or revision. The first two are ready to be published and authorization has already been granted by the State Board of Finance and Control.

The Amphibia of Connecticut. During the present fiscal biennium, Mr. Lewis H. Babbitt was engaged to prepare a paper on the toads, frogs, newts and salamanders of the State. This has now been completed and is ready for publication. The manuscript contains 74 typed pages, and is illustrated by four figures and XX plates. This manuscript contains keys for the separation of the species, descriptions, and notes on the life history and habits of each. Mr. Babbitt has included many notes of his own observations, and when published the bulletin should prove of great interest to all lovers and students of nature. (Now published as Bull. No. 57.)

The West Wall of the New England Triassic Lowland, by Girard Wheeler. This paper of 81 typed pages, 43 figures, VII plates, all line cuts, has been furnished to the Survey as a thesis for the doctorate at Columbia University. It is a comprehensive study of the lines of faulting along the west side of the Triassic Lowland area which extends northward across the middle of Connecticut and nearly across Massachusetts. When published, this paper will be of much interest to geologists and teachers. (Now published as Bull. No. 58.)

Higher Crustaceans of Connecticut, by the late Professor A. E. Verrill. This manuscript was submitted several years ago and contains about 600 typed pages and nearly 100 pages of illustrations. Since Professor Verrill's death, the paper has been submitted to specialists who seem to agree that it should be revised before publication. A rather large figure was mentioned as the cost of revision, so no action has been taken. It is hoped, however, that this paper may soon be revised and published for the benefit of the people of Connecticut.

Stegocephalian Amphibia of the Triassic, by Roy L. Moodie. Though few, if any, fossil Amphibia have actually been found in Connecticut, material is much more abundant from adjacent territory, and it is fair to assume that they occurred in Connecticut. Mr. Moodie, an authority on the subject, has submitted a brief paper of about 44 typed pages, 10 figures and 14 plates, which will be of interest chiefly to geologists and paleontologists.

Additions to the Check-List of the Insects of Connecticut, by W. E. Britton, with the assistance of members of the Department of Entomology at the Agricultural Experiment Station. This manuscript now contains about 150 typed pages and is constantly being revised and enlarged. At an early date it should be issued by the Survey as the First Supplement to the Check-List of the Insects of Connecticut (Bulletin No. 31) though numbered as a separate bulletin.

Clays of Central Connecticut, by G. T. Wickwire. This is a report of the re-examination of the larger areas in the central portion of Connecticut where brick clays occur, and contains estimates of the probable quantities of brick clays in these areas and the number of years that the supplies will last at the present rate of exploitation. It is now 32 years since Doctor Loughlin's more comprehensive report was published as Bulletin No. 4 of this Survey. Mr. Wickwire's paper contains 28 typed pages.

INVESTIGATIONS NOW IN PROGRESS

Connecticut Weather and Climate. Several years ago Mr. Leonard M. Tarr, formerly local forecast official of the New Haven office of the United States Weather Bureau, was engaged to prepare a report on the weather and climate of Connecticut. With his official duties, Mr. Tarr did not find time to prepare this report, but after his retirement in 1931, it seemed probable that he could go ahead with it. After a long illness, Mr. Tarr died September 13, 1935. A few weeks after his death I wrote to his widow to inquire if he had completed the report. She sent me all the papers that she could find on the subject, but they contained only a few scattered notes. Mr. J. M. Kirk, the present official in charge of the New Haven Weather Bureau, was then approached and he consented to prepare such a paper. Good progress has been made and the manuscript will probably be completed by early summer. This paper will contain tables of precipitation and will discuss the amount and distribution of rainfall, temperatures, storms, sunny and cloudy days, humidity, direction

and velocity of air currents, all of which contribute toward what we know as the climate of Connecticut. When published, this report should prove of interest to all residents of Connecticut.

Metamorphic or Crystalline Rocks of Connecticut. The late Professor W. G. Foye, of Wesleyan University, studied the rocks of the eastern highlands over a period of several years. It was expected to use the information gathered in revising the Manual of Geology (Bulletin No. 6). After Professor Foye's illness prevented further field work, though he was still able to work in the office, he offered to write a report of his studies, for the Survey. Many of these have never been published. At the time of his death, this manuscript had been nearly but not entirely completed. His successor in geology, Professor J. W. Peoples, with the help of Mr. C. J. Cederstrom, has gone over the manuscript and checked it with Professor Foye's field notes and brought it to completion. It will soon be ready for publication.

For several years Dr. William M. Agar, formerly of Yale University, and of Columbia University, has been engaged during his summer vacations in studying the rocks of the western highlands, and probably would have completed the work in 1934, if the elimination of the Survey appropriation had not made it necessary to stop all work on June 30, 1933. In 1935, he accepted temporarily the headmastership of the Newman School, Lakewood, N. J., and since then he has been unable to continue the studies, because his school duties require all of his time. Probably one, or perhaps two, more summers' work will be necessary to complete these studies of the western highlands.

The Land and Fresh Water Mollusks of Connecticut. Several years ago Mr. William J. Clench, of the Museum of Comparative Zoology, Cambridge, Mass., was engaged by the Survey to prepare a paper with illustrations on this subject. Mr. Clench has gathered nearly all available material and records in this group from Connecticut, and when time permits, probably within a year or two, he will be able to complete this work.

The Thysanura of Connecticut. Some four or five years ago, Dr. Arthur P. Jacot was engaged to prepare a manuscript for the Survey on the Thysanura, the lowest Order of insects. Dr. Jacot writes that he has prepared keys to the genera, and written a portion of the bristletails. The Collembola are mounted in balsam on about 200 microscope slides and work on determination has begun. The members of this group are nearly all of small size, and although a few species are of

economic importance, most of them subsist on decaying vegetable matter. Dr. Jacot is now with the United States Forest Service, and expects soon to be moved to New Haven. Then, no doubt, he will be able to collect more Connecticut material. It is hoped that he may be able to complete his paper at an early date.

The Diptera or Two-winged Flies of Connecticut. With the assistance of Dr. R. B. Friend, Assistant Entomologist of the Connecticut Agricultural Experiment Station, and himself a dipterist, the Superintendent of the Survey has projected a rather ambitious work on the Diptera similar to that on the Hemiptera, Bulletin No. 34, and to be a part of the same series, Guide to the Insects of Connecticut. Like the Hemiptera, it must be the joint work of a large number of specialists, each treating the family or group in which he is a specialist. Because of the size, it seems advisable to publish this work in about three parts, each part to be numbered as a separate bulletin. The first part will probably begin with the Family Tipulidae and end with the Syrphidae. The manuscripts have been completed for most of the families, and only four or five have not yet been received. It is expected that these will be finished within a few months, perhaps early next summer. Once completed and published, such a work on the Diptera is bound to prove exceedingly useful.

The Spiders of Connecticut. Recently Dr. B. J. Kaston, a student of spiders, has been engaged to prepare a report on the subject for publication as a bulletin of the Survey. Dr. Kaston has collected a vast amount of material (probably 10,000 specimens) in all regions of the State, during the past two years. It will probably take three or four years to examine all collected material, and prepare keys, descriptions and illustrations for publication.

Common and Conspicuous Plant Galls of Connecticut. The Department of Entomology of the Connecticut Agricultural Experiment Station at New Haven has collected and photographed plant galls for many years. The Superintendent of this Survey and Mr. B. H. Walden, Assistant Entomologist of the Station, are preparing a manuscript on plant galls and a portion is already in typed form. It can soon be completed and will then be published as a popular bulletin. If authorization can be obtained for printing a larger edition, of, say 10,000 copies, such a bulletin will undoubtedly have a considerable educational value for use in schools and libraries.

The Acarina or Mites of Connecticut. For several years, Dr. Philip Garman, Assistant Entomologist of the Connecticut Agricultural Experiment Station, has collected and studied

the mites occurring in Connecticut, many of which are of economic importance. Some species annoy, or live upon, animals, some injure plants, and many species are found in decaying organic matter. Already Dr. Garman has discovered in Connecticut several European species not before known to occur in the United States. Recently much material has been collected from elm, in connection with the Dutch elm disease investigations, and from other sources, by Dr. B. J. Kaston and others, and Dr. Garman is now at work on this material. Inasmuch as additional literature, especially European, has recently been procured for the library of the Department of Entomology at the Experiment Station, it should be possible to make good progress on this project. As little is known about these minute animals, it will probably be some time before a comprehensive treatise can be prepared on the subject, but it is hoped that a preliminary report may be submitted at an early date.

Fungi of the Trees and Shrubs of Connecticut. Doctors G. P. Clinton, Botanist of the Connecticut Agricultural Experiment Station, and Rush P. Marshall, Forest Pathologist, Bureau of Plant Industry, United States Department of Agriculture, stationed at New Haven, have made studies and observations, and collections of the fungi found on the native and introduced trees and shrubs in Connecticut. Some of these fungi are strongly parasitic and of considerable economic importance, and others may be only slightly parasitic or saprophytic, and of little or no economic importance. However, it is obvious that a paper will be of interest to all botanists and all growers of trees and shrubs, and may well be published as a bulletin of this Survey. Probably it will be at least six months before this paper can be completed for publication.

Rusts of Connecticut. Doctors G. P. Clinton, Botanist of the Connecticut Agricultural Experiment Station, and W. R. Hunt, author of Bulletin No. 36, are planning to prepare another paper on the rusts that will supplement Bulletin No. 36, and will contain keys and illustrations to the genera, and also list the species occurring in the State.

OTHER NEEDED INVESTIGATIONS

In addition to the investigations enumerated above, in geology, there may be need of studies of quartz, feldspar, trap rock, sandstones, sand and gravel, all of considerable economic importance in Connecticut.

In zoology, there is need of bulletins on the fishes, sponges, zoophytes, and annulata. Smaller groups of birds of great

economic importance might well be given detailed treatment in Survey bulletins. There still remain many orders of insects not covered in Survey publications.

In botany, there are several groups of fungi, such as the downy mildews, which should be studied and reports issued regarding them. There should also be a publication dealing with the native trees and shrubs of Connecticut.

PUBLICATIONS

The Survey has now published 56 bulletins containing 8,180 pages, 529 plates, 782 figures and 21 maps, not counting the list of bulletins in the back of each publication. Of this number, 14 bulletins, Nos. 1, 9, 12, 17, 21, 25, 27, 28, 32, 35, 38, 45, 50, and 52, totaling 324 pages, are administrative reports and contain little or no scientific matter. Altogether, 42 bulletins containing scientific matter have been published, with a total of 7,856 pages. Nineteen bulletins, Nos. 4, 6, 7, 8, 13, 18, 23, 24, 29, 30, 33, 40, 41, 44, 46, 47, 51, 55, and 56, deal with geology and contain 2,330 pages, 191 plates, 320 figures, and 8 maps, many small maps being numbered as figures. Eleven bulletins, Nos. 3, 5, 10, 11, 14, 15, 36, 37, 42, 43, and 48, deal with botany and contain 1,739 pages, 156 plates and 55 figures. Eleven bulletins, Nos. 2, 16, 19, 20, 22, 26, 31, 34, 39, 53, and 54, deal with zoology and contain 3,636 pages, 174 plates and 399 figures. Five of the zoology bulletins, Nos. 16, 22, 31, 34, and 39, are devoted to insects and contain 2,528 pages, 63 plates and 267 figures. One bulletin, No. 49, does not belong in geology, botany or zoology and it is here placed under geography. It contains 151 pages, 6 figures, and 13 maps.

The following list gives the number, title, author, number of pages and illustrations of each bulletin which the Survey has published up to this time:

BULLETINS

Any of the following bulletins that are not out of print will be sent postpaid on receipt of the price.

1. First Biennial Report of the Commissioners of the State Geological and Natural History Survey, 1903-1904; 18 pp., 23 cm., 1904. (Out of print).
2. A Preliminary Report on the Protozoa of the Fresh Waters of Connecticut: by Herbert William Conn, Ph.D.; 69 pp., 34 pls., 23 cm., 1905. (Out of print).
3. A Preliminary Report on the Hymeniales of Connecticut: by Edward Albert White, B.S.; 81 pp., 40 pls., 23 cm., 1905. (Out of print).

4. The Clays and Clay Industries of Connecticut: by Gerald Francis Loughlin, S.B.; 121 pp., 13 pls., 23 cm., 1905. .35
5. The Ustilagineae, or Smuts, of Connecticut: by George Perkins Clinton, S.D.; 45 pp., 55 figs., 23 cm., 1905. .20
6. Manual of the Geology of Connecticut: by William North Rice, Ph.D., LL.D., and Herbert Ernest Gregory, Ph.D.; 273 pp., 31 pls., 22 figs., (10 maps), 23 cm., 1906. (Out of print).
7. Preliminary Geological Map of Connecticut: by Herbert Ernest Gregory, Ph.D., and Henry Hollister Robinson, Ph.D.; 39 pp., 2 maps (1 in pocket), 23 cm., 1907. (Out of print).
8. Bibliography of Connecticut Geology: by Herbert Ernest Gregory, Ph.D.; 123 pp., 23 cm., 1907. .20
9. Second Biennial Report of the Commissioners of the State Geological and Natural History Survey, 1905-1906; 23 pp., 23 cm., 1906. .10
10. A Preliminary Report on the Algae of the Fresh Waters of Connecticut: by Herbert William Conn, Ph.D., and Lucia Washburn (Hazen) Webster, M.S.; 78 pp., 44 pls., 23 cm., 1908. .40
11. The Bryophytes of Connecticut: by Alexander William Evans, Ph.D., and George Elwood Nichols, B. A.; 203 pp., 23 cm., 1908. (Out of print).
12. Third Biennial Report of the Commissioners of the State Geological and Natural History Survey, 1907-1908; 30 pp., 23 cm., 1908. (Out of print).
13. The Lithology of Connecticut: by Joseph Barrell, Ph.D., and Gerald Francis Loughlin, Ph.D.; 207 pp., 6 tables, 23 cm., 1910. (Out of print).
14. Catalogue of the Flowering Plants and Ferns of Connecticut Growing Without Cultivation: by a Committee of the Connecticut Botanical Society consisting of Charles Burr Graves, A.B., M.D., Edwin Hubert Eames, M.D., Charles Humphrey Bissell, Luman Andrews, Edgar Burton Harger, Ph.B., and Charles Alfred Weatherby, A.M., 569 pp., 23 cm., 1910. .90
15. Second Report on the Hymeniales of Connecticut: by Edward Albert White, B.S.; 70 pp., 28 pls., 23 cm., 1910. .40
16. Guide to the Insects of Connecticut, prepared under the direction of Wilton Everett Britton, Ph.D. Part I. General Introduction: by Wilton Everett Britton, Ph.D. Part II. The Euplexoptera and Orthoptera of Connecticut: by Benjamin Hovey Walden, B.Agr.; 169 pp., 11 pls., 16 figs., (1 map), 23 cm., 1911. (Out of print).
17. Fourth Biennial Report of the Commissioners of the State Geological and Natural History Survey, 1909-1910; 31 pp., 23 cm., 1910. .10
18. Triassic Fishes of Connecticut: by Charles Rochester Eastman, Ph.D.; 78 pp., 11 pls., 8 figs., 23 cm., 1911. .30
19. Echinoderms of Connecticut: by Wesley Roswell Coe, Ph.D.; 152 pp., 32 pls., 29 figs., 23 cm., 1912. .50
20. The Birds of Connecticut: by John Hall Sage, M.S., and Louis Bennett Bishop, M.D., assisted by Walter Parks Bliss, M. A.; 370 pp., 23 cm., 1913. .60
21. Fifth Biennial Report of the Commissioners of the State Geological and Natural History Survey, 1911-1912; 27 pp., 23 cm., 1912. .10

22. Guide to the Insects of Connecticut, prepared under the direction of Wilton Everett Britton, Ph.D. Part III. The Hymenoptera, or Wasp-like Insects, of Connecticut: by Henry Lorenz Viereck, with the collaboration of Alexander Dyer MacGillivray, Ph.D., Charles Thomas Brues, M.S., William Morton Wheeler, Ph.D., and Sievert Allen Rohwer; 824 pp., 10 pls., 15 figs., 23 cm., 1916. 2.15
23. Central Connecticut in the Geologic Past: by Joseph Barrell, Ph.D.; 44 pp., 5 pls., 23 cm., 1915. .20
24. Triassic Life of the Connecticut Valley: by Richard Swann Lull, Ph.D.; 285 pp., 3 maps, 12 pls., 126 figs., 23 cm., 1915. .70
25. Sixth Biennial Report of the Commissioners of the State Geological and Natural History Survey, 1913-1914; 24 pp., 23 cm., 1915. .10
26. The Arthrostraca of Connecticut: by Beverly Waugh Kunkel, Ph.D.; 261 pp., 84 figs., 23 cm., 1918. .85
27. Seventh Biennial Report of the Commissioners of the State Geological and Natural History Survey, 1915-1916; 17 pp., 23 cm., 1917. .10
28. Eighth Biennial Report of the Commissioners of the State Geological and Natural History Survey, 1917-1918; 21 pp., 23 cm., 1919. (Out of print).
29. The Quaternary Geology of the New Haven Region, Connecticut: by Freeman Ward, Ph.D., 80 pp., 9 pls., 17 figs., 23 cm., 1920. .60
30. Drainage Modifications, and Glaciation in the Danbury Region, Connecticut: by Ruth Sawyer Harvey, Ph.D.; 59 pp., 5 pls., 10 figs., 23 cm., 1920. .55
31. Check List of the Insects of Connecticut: by Wilton Everett Britton, Ph.D.; 397 pp., 23 cm., 1920. 1.60
32. Ninth Biennial Report of the Commissioners of the State Geological and Natural History Survey, 1919-1920; 18 pp., 23 cm., 1920. .10
33. Geology of the Stonington Region, Connecticut: by Laura Hatch Martin, Ph.D.; 70 pp., 1 map, 8 figs., 23 cm., 1925. .60
34. Guide to the Insects of Connecticut, prepared under the direction of Wilton Everett Britton, Ph.D. Part IV. The Hemiptera or Sucking Insects of Connecticut: by Wilton Everett Britton, Ph.D., with collaboration of James Francis Abbott, Ph.D., Arthur Challen Baker, Ph.D., Harry Gardner Barber, A.M., William Thompson Davis, Dwight Moore DeLong, Ph.D., William Delbert Funkhouser, Ph.D., Harry Hazelton Knight, Ph.D., Asa Chandler Maxson, Herbert Osborn, D.Sc., Howard Madison Parshley, Sc.D., Edith Marion Patch, Ph.D., Louis Agassiz Stearns, M. Sc., José Rollin de la Torre-Bueno, F.E.S., Edward Payson Van Duzee, Harley Frost Wilson, M.S.; 807 pp., 20 pls., 169 figs., 23 cm., 1923. 2.15
35. Tenth and Eleventh Biennial Reports of the Commissioners of the State Geological and Natural History Survey, 1921-1924; 17 pp., 23 cm., 1924. .10
36. The Uredinales or Rusts of Connecticut and Other New England States: by Willis Roberts Hunt, Ph.D.; 198 pp., 2 figs., 23 cm., 1926. 1.00
37. Catalogue of the Lichens of Connecticut: by Alexander William Evans, Ph.D., and Rose Meyrowitz, M.S.; 56 pp., 23 cm., 1926. .60
38. Twelfth Biennial Report of the Commissioners of the State Geological and Natural History Survey, 1925-1926; 23 pp., 1 pl., 23 cm., 1927. .10

39. Guide to the Insects of Connecticut. Part V. The Odonata or Dragonflies of Connecticut: by Philip Garman, Ph.D.; 331 pp., 22 pls., 67 figs., 23 cm., 1927. 2.00
40. The Geology of the Shepaug Aqueduct Tunnel, Litchfield County, Connecticut: by William Macdonough Agar, Ph.D., with a chapter by Robert A. Cairns; 38 pp., 8 pls., 2 maps, 3 figs., 23 cm., 1927. .50
41. Guide to the Geology of Middletown, Connecticut, and Vicinity: by William North Rice, Ph.D., LL.D., and Wilbur Garland Foye, Ph.D.; 137 pp., 3 pls., 33 figs., 23 cm., 1927. 1.00
42. The Algae of Connecticut: by Clarence John Hylander, Ph.D.; 245 pp., 28 pls., 23 cm., 1928. 1.50
43. The Life Forms of Connecticut Plants and Their Significance in Relation to Climate: by Beulah Ennis, Ph.D.; 100 pp., 20 pls., 23 cm., 1928. .75
44. Report on the Water Resources of Connecticut: by Roscoe Henry Suttie, C.E.; 163 pp., 7 figs., 23 cm., 1928. 1.00
45. Thirteenth Biennial Report of the Commissioners of the State Geological and Natural History Survey, 1927-1928; 32 pp., 23 cm., 1929. .10
46. The Physical History of the Connecticut Shoreline: by Henry Staats Sharp, Ph.D.; 97 pp., 8 pls., 28 figs., 23 cm., 1929. .75
47. The Glacial Geology of Connecticut: by Richard Foster Flint, Ph.D.; 294 pp., 64 pls., 42 figs., 1 map (in pocket), 23 cm., 1929. 2.00
48. Additions to the Flora of Connecticut (First Supplement to Bulletin No. 14): by a Committee of the Connecticut Botanical Society consisting of Edgar Burton Harger, Ph.B., Charles Burr Graves, A.B., M.D., Edwin Hubert Eames, M.D., Charles Alfred Weatherby, A. M., Richard William Woodward, A. B., and George Henry Bartlett, Ph.B.; 94 pp., 23 cm., 1930. .75
49. Public and Semi-Public Lands of Connecticut: by Philip Laurance Buttrick, M.F.; 151 pp., 13 maps, 6 figs., 23 cm., 1930. 1.00
50. Fourteenth Biennial Report of the Commissioners of the State Geological and Natural History Survey, 1929-30; 26 pp., 23 cm., 1931. .10
51. The Minerals of Connecticut: by John Frank Schairer, Ph.D.; 121 pp., 14 figs., 23 cm., 1931. .75
52. Fifteenth Biennial Report of the Commissioners of the State Geological and Natural History Survey, 1931-1932; 24 pp., 23 cm., 1933. .10
53. The Mammals of Connecticut: by George Gilbert Goodwin; 221 pp., 33 pls., 19 figs., 23 cm., 1935. 2.00
54. The Reptiles of Connecticut: by George Herbert Lamson, M.S.; 35 pp., 12 pls., 23 cm., 1935. .50
55. The Petrology of the Prospect Porphyritic Gneiss of Connecticut: by Lincoln Stewart, M. A.; 40 pp., 8 pls., 2 figs., 23 cm., 1935. .50
56. Marbles and Limestones of Connecticut: by Fred Holmsley Moore, M.A.; 56 pp., 14 pls., 23 cm., 1935. .60
57. The Amphibia of Connecticut: by Lewis Hall Babbitt; 50 pp., 20 pls., 4 figs., 23 cm., 1937. .50
58. The West Wall of the New England Triassic Lowland: by Girard Wheeler; 73 pp., 7 pls., 43 figs., 23 cm., 1937. .60

BOUND VOLUMES

A few hundred copies of each bulletin of the foregoing list have been reserved for binding, and these have been assembled and bound in the following order:

Volume	Contains Bulletins	Price Prepaid
I	1-5	Out of print
II	6-12	Out of print
III	13-15	Out of print
IV	16-21	\$2.50
V	22	2.75
VI	23-32	4.15
VII	33-35	3.75
VIII	36-42	5.00
IX	43-48	5.00

Correspondence concerning projects, and subject matter of the bulletins, should be sent to

W. E. Britton, Ph.D., D.Sc., Superintendent,
Agricultural Experiment Station,
New Haven, Conn.

Requests for bulletins should be made to

James Brewster,
Distribution and Exchange Agent,
State Library, Hartford, Conn.

CLASSIFICATION OF SURVEY BULLETINS

From the beginning the Survey bulletins have been of two kinds as follows:

1. Administrative reports.
2. Scientific bulletins.

The former give an account of the organization and policy of the Survey and a report of the progress of the Survey work but contain little or no real scientific matter.

The scientific bulletins have dealt with geology, botany and zoology, and whether consciously or unconsciously have been somewhat evenly divided between these three subjects. Now geography has been added to the list of subjects. The classified list of bulletins by numbers is as follows:

Administrative reports: Bulletins 1, 9, 12, 17, 21, 25, 27, 28, 32, 35, 38, 45, 50, and 52.

Geology: Bulletins 4, 6, 7, 8, 13, 18, 23, 24, 29, 30, 33, 40, 41, 44, 46, 47, 51, 55, and 56.

Botany: Bulletins 3, 5, 10, 11, 14, 15, 36, 37, 42, 43, and 48.

Zoology: Bulletins 2, 16, 19, 20, 22, 26, 31, 34, 39, 53, and 54.

Geography: Bulletin 49.

DISTRIBUTION OF SURVEY PUBLICATIONS

All bulletins issued by the Survey are distributed by the State Librarian, Mr. James Brewster, who is the Distribution and Exchange Agent for the Survey. These publications are distributed liberally to colleges and universities, geological and natural history surveys, scientific societies and public libraries.

Many important scientific books and papers are received by exchanges and otherwise. These are deposited in the State Library at Hartford and help to form a most valuable reference collection, which is constantly being increased.

These bulletins have also been sent rather freely on request to scientists that specialize in the subjects covered by the bulletins, and to teachers and other residents of Connecticut. Other persons have been able to purchase them at prices that barely cover the cost of printing and transportation.

Mr. Brewster writes as follows:

"The Connecticut Geological and Natural History Survey must be congratulated on the standard established and the subjects covered in the several bulletins published. The wide and persistent demand which comes from all parts of our country and abroad for certain of these bulletins indicates that the publications are meeting a real need.

"As Distribution and Exchange Agent of the Survey, I am in a position to note how general this demand is. I find that we receive at the State Library an average of over three letters a day requesting copies of the bulletins. In the course of a month, we received requests from Argentina, England, Brazil, and Canada.

"It will be noted that Bulletins 1, 2, 3, 6, 7, 11, 12, 13, 16, and 28, and Bound Volumes I, II, and III are out of print. In several other cases, the stock is very low, and we are advising individuals from outside the state that free distribution is no longer permissible.

"It is to be hoped that some of the bulletins which are out of print will be soon available in a new edition. This especially applies to Bulletin 6 for which there has been an insistent demand for several years. Among the most popular of the bulletins are perhaps Number 14, Catalogue of the Flowering Plants and Ferns of Connecticut, Number 20, The Birds of Connecticut, Number 42, The Algae of Connecticut, Number 47, The Glacial Geology of Connecticut, Number 49, Public and Semi-Public Lands of Connecticut, and of the more recent bulletins, Number 51, The Minerals of Connecticut, Number 53, The Mammals of Connecticut, and Number 54, The Reptiles of Connecticut."

INVENTORY OF PUBLICATIONS

The following table shows the date of issue, size of edition, and the number of copies now on hand at the State Library of each bulletin and bound volume published by the Survey, from figures kindly supplied by Mr. Brewster. It will be noted that Bulletins Nos. 1, 2, 3, 6, 7, 11, 12, 13, 16, and 28, and Bound Volumes I, II, and III, are already out of print and cannot be supplied. That there is a constant demand for the scientific bulletins is shown by the number of copies on hand, in the right-hand column.

BULLETINS			
Number	Year of Issue	Size of Edition	Copies on Hand
1	1904	3,000	Out of print
2	1905	3,500	Out of print
3	1905	3,500	Out of print
4	1905	3,500	182
5	1905	3,500	273
6	1906	4,000	Out of print
7	1907	3,500	Out of print
8	1907	3,500	238
9	1906	3,000	394
10	1908	3,500	113
11	1908	3,000	Out of print
12	1908	3,000	Out of print
13	1910	3,500	Out of print
14	1910	4,000	211
15	1910	3,500	838
16	1911	3,500	Out of print
17	1910	3,000	697
18	1911	3,500	936
19	1912	3,500	1,070
20	1913	4,500	239
21	1912	3,000	1,156
22	1916	3,500	156
23	1915	4,000	1,017
24	1915	4,000	681
25	1915	2,900	234
26	1918	3,000	249
27	1917	2,900	1,102
28	1919	2,500	Out of print
29	1920	2,500	804
30	1920	2,500	246
31	1920	3,000	491
32	1920	2,900	504
33	1925	2,500	1,648
34	1923	3,000	198
35	1924	2,500	1,430
36	1926	3,000	1,522
37	1926	3,000	974
38	1927	2,500	381
39	1927	3,000	882
40	1927	3,000	1,283
41	1927	3,000	519
42	1928	3,000	1,058
43	1928	3,000	1,261
44	1928	3,000	1,360

45	1929	2,500	963
46	1929	3,000	1,380
47	1930	4,000	1,958
48	1930	4,000	1,426
49	1930	4,000	1,756
50	1931	2,500	779
51	1931	4,000	1,405
52	1933	2,500	792
53	1935	3,000	1,355
54	1935	3,000	1,342
55	1935	3,000	2,080
56	1935	3,000	1,787

BOUND VOLUMES

Volume	Year of Issue	Size of Edition	Copies on Hand
I	1905	600	Out of print
II	1908	600	Out of print
III	1910	600	Out of print
IV	1914	600	180
V	1916	600	211
VI	1921	400	172
VII	1926	300	172
VIII	1928	300	155
IX	1931	300	163

APPROPRIATIONS

At the start in 1903, the Survey appropriation was \$3,000 for the biennial period, and the work was conducted on this basis until 1917, when the General Assembly increased the biennial appropriation to \$6,000. This appropriation was renewed by each General Assembly until 1927, when it was raised to \$8,000, \$6,500 being for scientific work and \$1,500 for office expenses. In 1927 and for 1929, \$10,000 was requested, but not granted nor even recommended by the State Board of Finance and Control. The same amount (\$10,000) was requested of the General Assembly of 1931 and received the support of the recommendations of the State Board of Finance and Control. Nevertheless, this increase was not granted by the General Assembly. In view of the financial situation the Budget Committee in 1932 requested that the appropriation be reduced to \$6,000 for the biennial period from July 1, 1933, to June 30, 1935, and the budget items were submitted accordingly. However, the appropriation was eliminated altogether for the biennial period, July 1, 1933, to June 30, 1935, and all the work of the Survey had to stop. The General Assembly reinstated the Survey appropriation to the amount of \$7,740 for the biennial period, or \$3,870 each year, beginning July 1, 1935. This is \$8,000 less certain salary cuts as were made in all departments. A request has been made for the full \$8,000, to the General Assembly of 1937. (This amount was granted.)

LEGISLATION ESTABLISHING THE STATE
GEOLOGICAL AND NATURAL HISTORY SURVEY

The State Geological and Natural History Survey was established in 1903 by act of the General Assembly (Chapter 133, Public Acts of 1903) and amended in 1915 (Chapter 185, Public Acts of 1915) to include as one of its commissioners the president of the Connecticut College for Women.

This act as amended is now Sections 2227-2230, Chapter 122, page 759 of the General Statutes, revision of 1930, and reads as follows:

STATE GEOLOGICAL AND NATURAL HISTORY SURVEY

Sec. 2227. Appointment and duties of commission. The State Geological and Natural History Survey shall continue to be under the direction of a commission composed of the governor, the president of Yale University, the president of Wesleyan University, the president of Trinity College, the president of the Connecticut Agricultural College and the president of the Connecticut College for Women, or so many of them as shall accept such office, each of whom shall serve without compensation, but shall be reimbursed for expenses incurred in the performance of official duties; and said commissioners shall have general charge of the survey, and shall appoint as superintendent of the same a scientist of established reputation, and such assistants and employees as may be necessary; and they shall also determine the compensation of, and may remove, all persons employed by the commission.

Sec. 2228. Objects of survey. Said survey shall have for its objects: (1) An examination of the geological formation of the state, with special reference to such economic products as building stones, clays, ores and other mineral substances; (2) an examination of the animal and plant life of the state, with special reference to its economic and educational value; (3) the preparation of special maps to illustrate the resources of the state; (4) the preparation of special reports, with necessary illustrations and maps, which shall embrace both a general and detailed description of the geology and natural history of the state.

Sec. 2229. Reports; distribution and sale. Said commissioners shall cause to be prepared a report to the general assembly before each meeting of the same, showing the progress and condition of the survey, together with such other information as they may deem useful or as the general assembly may require. The regular and special reports of the survey, with illustrations and maps, shall be prepared for publication, and, when printed, the reports shall be distributed or sold by the commissioners as the interests of the state and of science may demand, and all moneys obtained by the sale of the reports shall be paid into the state treasury.

Sec. 2230. Disposition of material collected. All material collected, after having served the purpose of the survey, shall be distributed by the commissioners to the educational institutions of the state in such manner as to be of the greatest advantage to the educational interests of the state, or, if deemed advisable by said commissioners, the whole or any part of such material shall be put on permanent exhibition.

FINANCIAL STATEMENT

BIENNIAL PERIOD FROM JULY 1, 1931 to JUNE 30, 1933

Receipts

Appropriation for biennial period ending June 30, 1933 \$8,000.00

Expenditures

Salaries and wages	\$5,429.70
Printing and illustrations	35.75
Stationery and office supplies	42.80
Postage	32.15
Telegraph and telephone	2.56
Express	3.42
Scientific supplies	1.50
Chemical analysis and rock sections	115.00
Traveling expenses	1,716.83
Miscellaneous	52.09
Total expenditures	<u>7,481.30</u>
Balance, June 30, 1933	\$568.70

There was no appropriation granted for the biennial period July 1, 1933 to June 31, 1935.

ANNUAL PERIOD JULY 1, 1935 TO JUNE 30, 1936

Receipts

Appropriation for year ending June 30, 1936 \$3,870.00

Expenditures

Salaries and wages	\$1,759.82
Printing and illustrations	43.85
Stationery and office supplies	44.51
Postage	23.42
Telegraph and telephone	1.14
Express	1.28
Traveling expenses	26.06
Miscellaneous	12.26
Total expenditures	<u>1,912.34</u>
Balance, June 30, 1936	\$1,957.66

SIX-MONTHS' PERIOD JULY 1, 1936 TO DECEMBER 31, 1936

Receipts

Appropriation for year ending June 30, 1937 \$3,870.00

Expenditures

Salaries and wages	\$688.53
Traveling expenses	22.15
Miscellaneous	3.00
Total expenditures	<u>713.68</u>
Balance on hand December 31, 1936	\$3,156.32