State of Connecticut

PUBLIC DOCUMENT No. 47

STATE GEOLOGICAL AND NATURAL HISTORY SURVEY

EDWARD L. TROXELL, Ph.D., Superintendent

Bulletin No. 66

HARTFORD

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State Geological and Natural History Survey of Connecticut

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OF THE

State Geological and Natural History Survey

1941-1942

BULLETIN No. 66

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1942

LETTER OF TRANSMITTAL

Hartford, Connecticut,
December 7, 1942

His Excellency, Robert A. Hurley,
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, in compliance with past custom, the twentieth biennial report of the Survey, covering the two years ending December 31, 1942.

Respectfully submitted,

Edward L. Troxell
Superintendent

TWENTIETH BIENNIAL REPORT

OF THE

GEOLOGICAL AND NATURAL HISTORY SURVEY

TABLE OF CONTENTS

TWENTIETH BIENNIAL REPORT

OF THE

GEOLOGICAL AND NATURAL HISTORY SURVEY

OF CONNECTICUT

EDWARD L. TROXELL, Ph. D., *Superintendent*

"Said Commissioners shall cause to be prepared a report to the general assembly before each meeting of the same."

INTRODUCTION

While the prescribed function of the Survey is broadly the researches into the geology and biology of the State and the promotion of the use of our natural resources, its greatest opportunity undoubtedly lies in the promulgation of information. The Survey stands in large measure for the discovery of new ideas, for the advancement of knowledge in the natural sciences; it has endeavored, with some considerable success we believe, to encourage investigations in various fields and it has brought about the publication of important discoveries. The reputation of the State Geological and Natural History Survey rests largely on its three score and more bulletins.

The State Survey has now been very comfortably housed at Trinity College for some three years; it is deeply indebted to the college for much assistance. Not only in the facilities of an office which it shares with the Department of Geology, but also from every part of the campus it has received help and has profited by cordial existing relations.

Because of the great interest of the Commissioners in the publishing of manuscripts on our natural history, the Survey has sought to draw its information from all possible sources; as a publication medium it has cooperated with and has assisted many individuals and agencies doing research work. This has mutual advantage; while the Survey encourages studies along various lines, it receives many fine manuscripts and in turn offers these for the benefit of the people of the State. In its efforts to widen its sphere of usefulness the Survey has cooperated with and has received the ready assistance of a number of State Agencies, particularly the following:

Agricultural Experiment Station, Defense Council,

Development Commission, Forest and Park Association,

State Library, and the University of Connecticut.

Outside of the State, the Survey has been in contact with:

Association of State Geologists, American Wildlife Institute,

Boston Society of Natural History, New England Council,

United States Bureau of Mines, Coast and Geodetic Survey,

Geological Survey, and War Production Board.

Many of the science departments of the colleges and universities of the State and elsewhere have assisted us in our investigations. The facilities of the State Library have been ours; it acts as distribution and exchange agent and sends out our bulletins and varied information. It is a pleasure to mention the kindly advice and help which we receive from the State Librarian, Mr. James Brewster. Among others who have shared most generously the labors of this office and have made important contributions to the work of the Survey is Dr. Roger B. Friend, State Entomologist. To a considerable extent, Dr. Friend inherited the obligations of our predecessor, the late Wilton Everett Britton, and in so doing has been most generous of his time and energies in promoting the publication of papers inspired by Dr. Britton.

As usual this office serves in many capacities. It carries on correspondence, holds conferences, does proof-reading, makes analyses and identifications; it receives requests for information, maps, bulletins and even for specimens themselves and it has always been our policy to furnish these, when possible, and to make the Survey useful to the greatest degree.

Our Contribution to the War:—The Commissioners of the State Geological and Natural History Survey have been eager to do as much as possible for the victory effort; according to the original plan and expectation this was to be done by having scientists in various parts of the State carry on useful work, but we did not anticipate the drafting of our personnel to other activities. This, however, as confusing and disappointing as it is has in itself been a useful contribution. Some of those listed on our rolls have gone to the armed forces; many have been called to other tasks where they are serving more directly the Federal Government. In some instances our workers, particularly our geologists, have gone to other duties which are precisely the type of investigation carried on here in the State. We feel that this has indeed been an important service on our part; men have been trained, have had practice and experience serving our agency which gives them greater value in their new work. Patterson, who worked in the field with Dr. Cameron has gone to the armed forces; Cameron, Dow, Keppel and Peoples are now serving government agencies.

Connecticut cannot be rated as one of the great mineral producing states even though our non-metals, building stone, gravel and sand, clays, and silica deposits have always been of great use. While we have no extensive mining operations, yet there are products here which, if the war continues long, may be of critical importance; as a result of efforts made we share responsibility in producing in economic quantities: feldspar, magnesium, mica, peat, silica. From the field investigations we find an abundance of other minerals not yet

in production: garnet, iron, kaolin, manganese, soapstone, tremolite-asbestos, etc. There are still other minerals that are valuable, but not abundant: kyanite, nickel, tungsten, etc. Many of these may prove to be strategic minerals before the war has been brought to a successful conclusion.

Promotion of our Natural Resources:—A recent intensive field examination of our peat bogs togther with a study of the literature has led to the further development of a significant industry here in the State. Particularly in connection with the activities of Mr. Leonard O'Neill has the State Survey been working on this important economic product. The peat bogs here in Connecticut have large acreage and some of them are known to have a depth of as much as 30 feet. Peat is well known in its use as a fertilizer and fuel; in this country only in rural districts, however, is it burned to any extent. But peat has a dozen or more other uses and recently it has come to be the basic material for the making of plastics and alcohol; it is even found possible to turn it into gasoline.

Capital and equipment have now been made available and everything points to the production of peat in commercial quantities early in 1943; the first efforts will be devoted to its use for insulation, for fruit storage, as a soil conditioner and fertilizer, and for the making of plastics. One is intrigued by the thought that we have here in the State a material in abundance that can be used as a substitute for metal and that may also provide a source of precious gasoline.

Discovery has also been made recently of a material called "loess"; this is a very fine sand or silt of wind and glacial origin found in many places in and around Hartford. Because of its peculiar origin it was realized that it was exactly like the moulding sands produced in nearby states; tests have been made as to its composition and fitness and it is found to have the right qualities for this purpose. When greater need has developed, the distribution of the loess can be ascertained, and when there are fewer conflicting interests we believe this substance may come to have commercial value.

Progress in Remapping the State:—There is promise that the mapping of the State, following a program under the direction of the United States Army, will be completed in 1943; the misfortune of the war turns to our advantage and profit—it has emphasized the need and importance of accurate maps. To satisfy a possible emergency, the Army has surveying parties here in Connecticut and work in one-third of the area seems to be completed; that is a southern strip along the shore. We are told that the rest of the State is advancing rapidly in its remapping.

These new maps, on the basis of a seven and one-half minute quadrangle, will be approximately two and one-half inches to the mile and will show either the twenty foot contour, in certain areas already surveyed, or a ten foot contour in that part which is being done by the Topographical Branch of the Geological Survey. The accuracy of these maps will be vastly superior to those which are still in common use made fifty or more years ago. Some of the new maps with the large scale and small contour interval are now completed and available; these comprise a half dozen quadrangles in the region of New London.

Unfortunately at the present time the other maps even though finished will not be immediately available to the people of the State; they are made exclusively for the Army and the printing is restricted. After the war is over it will be our privilege and greatly to our advantage to take prompt part in the printing of these new maps. This can be done for approximately $100 or less per quadrangle; some 84 maps will therefore cost about $8,000. At that we will be able to secure the maps at remarkably low cost in view of the great expense carried by the Army in the preliminary work and the original drawing; to be specific, the maps will be less than 2% of the price paid by neighboring states which have in the past shared with the government the financial responsibility in the mapping program.

SUMMARY OF BIOLOGY IN PROGRESS

As we have stated before, it offers a fine opportunity for the State to have such splendid scientific workers, the finest minds of our various boards and agencies, of our colleges and universities, thus turned to its advantage. The State may have the results of their researches usually without cost; sometimes it supports the field work by taking over minor expenses, at times it allows a modest per diem or gives an honorarium.

The investigator is free to publish his findings in any one of many technical journals but it is always more satisfactory to us to present them in our own bulletins and thus render them immediately available to the people of the State for their profit and pleasure. We owe a great debt of gratitude to the investigators who spend months and years at their tasks, without compensation, searching for the truth and writing, in order that we may benefit from their toil.

Cancer and Cambarus:—Early in 1941 Dr. Donald C. G. MacKay of the University of Connecticut began an examination of *Cancer* and *Cambarus* for the State; these are the crabs and crayfish. Shortly after beginning this work, Dr. MacKay took leave from the University to study for a time in British-Columbia, working on the edible crab of the marine waters there, and then he went to Hawaii to teach in the University of Honolulu and to carry on his researches. As a result of his investigations he has published several papers and now comes back with increased knowledge of these crustaceans to begin again his studies in and for the State of Connecticut.

Dr. MacKay had interesting and eventful experiences on that fateful day in December at Pearl Harbor and during the weeks that followed took time off from his biology and teaching to aid the war effort in various ways.

It is the plan of the Survey to encourage Professor MacKay in his further studies here, particularly on the crayfish, *Cambarus*. He will collect specimens, study the life histories, the food, growth, behavior, propagation, etc., of these types so little known to the average person. It appears that there has never been an authoritative investigation of the changes and growth in the larval stages of these animals. Dr. MacKay's important recent publications on the subject give us confidence that the work he will do in Connecticut will be valuable both from the scientific and economic standpoint.

Post Glacial Lake Deposits:—Dr. Edward S. Deevey, Jr. has continued work in Connecticut following the lines of research set forth by him in our Bulletin No. 63 on the lake and pond fishes. During the summer of 1942, encouraged by the State Survey and in collaboration with other scientists at Yale University, Dr. Deevey made a number of tests by boring into the deposits underlying the various lakes in the State. The sample sediments obtained will be useful for study and investigation: 1, as to the post glacial time factor shown by pollen analyses; 2, as to the nature of other microfossils; 3, to give data on the changing lake types; and 4, to furnish information on diatoms and their chemical compositions.

It is hoped this examination into the lake-bottom deposits that lie on top of, and are subsequent in time to, the glacial deposits will be continued during, or surely following, the termination of the war.

Amphibians and Reptiles:—For years studies have been carried on by Lewis Hall Babbitt in herpetology in New England. In 1937, Mr. Babbitt wrote Bulletin No. 57, The Amphibia of Connecticut; since that time he has turned his attention to the Reptilia and the Survey stands ready to assist in this timely investigation.

Mr. Babbitt's work as a collector of toads, frogs and salamanders, as well as reptiles, has made him an authority on the subject; he has been gathering, studying and photographing these animals in their native haunts and he has supplied specimens and varied scientific information to many of our museums and schools. Always alert in his search for new material he now reports the discovery of strange species—he has found lizards in the State which were never before described. He has been cooperating with and will pursue his studies making use of the advantage offered in various museums and he will compile data looking to the writing of a new bulletin on the reptiles to take the place of an older one now completely out of date.

The Hemiptera or the Sucking Insects:—Dr. R. M. DeCoursey of the State University has begun a study on the small, sucking insects of Connecticut. According to his plan this will be a non-technical work that will fill a need where published information is now lacking.

Professor DeCoursey will generalize on some twenty seven families—for which no key now exists—rather than on the details of the genera and species. Much of the preliminary work: collecting material, rearing, and identifying has already been done. Further biological considerations include ecology, geographic distribution, habitat, feeding habits, the economic importance, general morphology, life histories, collecting, and taxonomy.

Particular attention is being paid to the nymphs of this order of insects. Researches have, heretofore, been concerned largely with the adults and nothing comprehensive on the young stages has been accomplished; yet, from the practical standpoint, the recognition of the youthful stages is highly important; they, too, may be very harmful. Practically all of the species and genera are to be found in Connecticut and the collecting of specimens will therefore be an easy procedure.

Forestry and Tree Census:—At the suggestion of the State Forester and under the close supervision of Dr. Raymond Kienholz, this Agency has been supporting a survey of the forest resources of county after county here in the State. It was clear from the beginning in 1941 that this study would have great value and would in all probability produce additional unpredictable results of great importance. Such a survey it was thought would be helpful, for instance, in the investigation of the gipsy moth and its favorite food trees, would be of importance as a basis for ecological studies, would give the range of unusual species, for example, the Southern White Cedar, the Arbor Vitae, the Persimmon, etc., and would to a great extent tie into the past forest history of the State and help to predict future trends. The information on the forests of the State will, it is expected, furnish subject matter for a bulletin in three or four years.

The general plan of the work was to make cross country surveys at two mile intervals, determining, by pacing, the amount of open land, forest, swamp, etc. and for the forest land it would ascertain the amount of hardwood, softwood and other forest types and also the size and age of the trees. This information together with data from other sources would constitute a picture of the volume of timber and cordwood present, and of its nature, more complete than has ever been available heretofore in the State.

This survey was carried on by two diligent young men; first, Harry A. McKusick began the field work and continued it for a month or more. In the Spring of 1942 Donald Tufts took over the work and kept at it energetically until the beginning of the University year. For a while the travel was done by automobile but later it was carried on with bicycle and on foot almost entirely. It is the opinion of Dr. Kienholz that this investigation contributes directly to some of our war needs and, in addition, will have definite post-war value; the results obtained have been highly satisfactory.

Through the endeavors of McKusick and Tufts the following counties have been covered by the survey: Middlesex, Fairfield, New Haven and part of Hartford. The work has progressed satisfactorily, but Hartford (in part), Tolland, and New London Counties remain to be mapped. Litchfield and Windham Counties were surveyed by the Forestry Department in 1930 and the entire State hastily done in 1915. The present studies will bring the information up-to-date and through comparison with previous surveys will make predictions of future trends possible. It is of interest to note that New Hampshire has observed the "strip survey" method used in this State with a view to carrying on a similar study.

GEOLOGICAL INVESTIGATIONS

With the coming of the present Superintendent to the Survey, great difficulty was experienced in giving ready answers to the numerous inquiries about our natural resources, particularly the rocks and minerals. As time has passed. with many workers in the field and as information comes in, the knowledge of our geology increases and we can be more intelligent in our responses.

Early it seemed wise to secure assistance in compiling data along these lines and the services of William E. B. Benson, then a graduate student at Yale, were secured; in part his work was to be a library compilation and in part a field investigation. As a result of his studies we have a fifty-seven page manuscript of valuable information which has proven to be the more useful as we get deeper and deeper into the war. It is now hoped that such a treatment may be expanded into a full report on our economic geology, both metals and minerals, and be published as a bulletin some time in the near future.

Trained geologists have been working in many parts of the State and, during the last year, have concentrated their search on minerals that might be strategic at this time. The following pages will set forth the outstanding results and plans of their investigations, paricularly of the following: Dr. Cameron on the geology of western Connecticut; Dr. Keppel and Mr. Dow in eastern Connecticut; Dr. Flint, supplementary studies on glaciation. This does not include the completed study by Dr. Krynine, mentioned later, nor the general geology, the subject of a bulletin in the making.

Geology in the Western Highlands:—In 1941 Dr. Eugene Cameron,* of Columbia University, took over the task of Dr. William Agar whose extensive studies in the western part of the State has led to much mapping and many publications that treat of our geology. Previous to his entering the service of the State Geological Survey, Dr. Cameron worked on the Mount Prospect gneiss and associated intrusive rocks near Litchfield; that investigation, which included an examination of the old nickel deposits, was supported by a grant from the Penrose Fund of the Geological Society of America. It was possible for Dr. Cameron to continue this work for the State Survey and in the summer of 1941 he mapped an area of 20 square miles, studying the rock structure of this section carefully.

When this work is completed not only will we have a detailed map of that region but new and valuable information on the processes that shaped the rock structures; it will constitute a part of the work in the State which, as a whole, will comprise the manuscript of a new bulletin. Extensive laboratory work during the winter season formed an important part of the general studies; this will lead to independent publications as soon as the present emergency permits.

In the Autumn of 1941 a preliminary examination of the Hartland formations was begun by Dr. Cameron; this covers an area of some 625 square miles. Traverses were made from east to west at frequent intervals across the section; the nature of the rock was noted and samples were taken for laboratory treatment. Several other minor studies and investigations were made during the fall and winter of that year; the feldspar and mica deposits in various places, the kyanite minerals at Judd's Bridge, and the tungsten deposits near Trumbull were examined. Out of this came the employment of Joseph Fisher, graduate student of Columbia University, who, under Dr. Cameron's direction, attempted to determine the workability of the tungsten ore desposits; the full report is in our hands.

*Now with the United States Geological Survey.

The study of the Hartland schist proves to be an extensive, long-time task; it will be worth several seasons of effort, after the war, and will contribute materially to the completion of a geological map of the State. Dr. Cameron recommends that the problem of the Hartland schist be attacked in one of two ways: 1, to map continuously until the work is all done, then to examine the area for results and specific values; or to sub-divide that portion of the State into smaller parts and treat each as a separate problem. This latter seems the better plan because each part can be treated as a unit and covered in a separate publication, leaving the broader summary as a report for the whole area at the end of the investigation. The first plan would call for completion of all the study and mapping before results could be forthcoming and if it were interrupted the fruits of the labor would be largely lost.

With the field season of 1942, Dr. Cameron was able, in addition to other tasks assigned to him, to map approximately 20 square miles of granite-pegmatite in Bethlehem, Woodbury and Watertown; it is well this work is being done for the older studies are badly in need of revision. The internal structure and the relation of the "Bethlehem pegmatite" to other formations, particularly the Hartland schist, were closely examined. During the summer and fall of 1942 the search for critical minerals was intensified; leads were followed up in many parts of the State and here is a partial list of products that have demanded attention: Kyanite, Nickel, Mica, Garnet, Asbestos, Pyrophyllite and Soapstone. The completion of these studies for the State has been interrupted by the war's demands.

Conditions brought on by the emergency have made it necessary for us to let Dr. Cameron go to the United States Geological Survey for a period; he can there serve more closely in cooperation with the government and his work can be more accurately directed in the search for the strategic minerals so much needed. For the present he cannot be counted on to do further work for the State Survey even though he will continue his researches in the State and at times in the very same geological formations. Dr. Cameron has expressed the wish, and it is our hope, that, after the war is brought to a successful completion, he will be able to give attention again to the problem of the geology of the western part of the State.

The Eastern Crystallines:—In 1938 in conjunction with Professor Joe W. Peoples, of Wesleyan University, Dr. David Keppel* began making a structural map of the Glastonbury gneiss, a well known rock of East Central Connecticut. This work was intended to follow the exhaustive field studies of Dr. Wilbur Foye and had for its chief purpose the making of a map of the internal structures, particularly of the Glastonbury gneiss, and the correlation of it with the Monson gneiss of Massachusetts.

It is found that this Connecticut body of rock is an elongated intrusive lying in the western part of the eastern highlands and continues northward across the State line. It is to be noted that, in a similar manner, the Bolton schist of Connecticut, which is intruded by the Glastonbury gneiss, may extend into and be a part of the Brimfield schist of Massachusetts.

*Now with the Colonial Mica Corporation as Geologist, in North Carolina.

Both Drs. Peoples and Keppel have been called away to do other geological work definitely helpful to the United States government. Dr. Keppel's training in our Connecticut geology gives him added value to the Colonial Mica Corporation which was founded to handle the important task of producing mica for the war effort. It is hoped and expected that both Keppel and Peoples will be back to continue the geological work which they began here in the State.

Donald Dow, working under the supervision of Dr. Keppel, carried on field studies in geology during the summer of 1941; Dow is now with the United States Geological Survey. The purpose of the "investigation was to map in detail the structure of the Lebanon gabbro and to conduct a petrologic study". Mr. Dow made a collection of many specimens and from these did a microscopic study of thin sections. The field work was conducted in very difficult terrain, but it was well done and provided the subject matter for a thesis which satisfied the requirements for the Masters Degree in Geology at Northwestern University.

This useful work, we hope, will be incorporated in our exhaustive study of the State to be published later.

A Revision of Glacial Geology:—Dr. Richard Flint, Professor of Geology, Yale University, has been doing work in many parts of the State to supplement his earlier extensive work on glaciation in Connecticut; during the summer of 1941 he made many field trips which he is following up with laboratory work and writing.

Dr. Flint has pressed on with this revision of his earlier work in order to be able to contribute to a full treatment of the general geology of the whole State. His renewed interest was inspired by a meeting of several leading geologists in the State at which all agreed to take part in the compiling of data in their various fields and in the composing of manuscripts for a new bulletin. The first book on the general geology published in 1906 was one of our most valuable bulletins but the supply has long been exhausted.

The work of Dr. Flint in 1941, extending and amplifying his earlier studies, was directed to the sand-and-gravel outwash desposits along the Connecticut valley below Rocky Hill and to other layers made at the same time and of similar origin in the Kensington-Berlin-Meriden district. All of these formations, as well as other scattered desposits, were mapped in detail. An examination was made of the Plainville region and of the sand-and-gravel complex centering at Mansfield.

The making of new excavations always offers the geologist a fine opportunity to see what lies beneath the surface; Dr. Flint took advantage of the occasion offered by the building of the Wilbur Cross Highway and he was also at hand during the construction of the Willimantic Airport to get first-hand information.

Professor Flint reports that his results are well toward completion and will be available when we are able to turn again to the bulletin, delayed by the war's demands, on the geology of the whole State.

NEW BULLETINS PUBLISHED OR IN PRESS

Since we feel that the reputation of the Survey rests largely in our bulletins, it has been a source of great satisfaction to us to know that they have uniformly created a good impression. Weather and Climate of Connecticut published by our predecessor came out in 1940. A number of other bulletins issued since that time are here represented:

A Fishery Survey of Important Connecticut Lakes, Bulletin No. 63:—This unusually interesting bulletin, published in 1942, was written under the direction of Biologist Lyle M. Thorpe of the Board of Fisheries and Game; a number of authors contributed separate manuscripts. The work has for its chief purpose the improvement of the fishing in the impounded waters of the State. While it has thus met the needs and interests of the fishermen and was designed to promote their understanding and cooperation, chiefly, it still deals with the biology of the fishes in a manner that will be of great value to the scientist. The angler may come more fully to realize that science is his friend and benefactor.

The work treats of the physical, chemical, and biological conditions in each pond or lake and gives us the life history and habits of each important fish species. It considers the effect of parasites, the importance of food types, the growth stages, the restoration of pond fish through management, and even the geological background of the lake itself.

The book as a whole is divided into four parts and there is available a limited edition of the separates for each part. The various sections worked out by the different authors are: 1, Fishery management; 2, Limnology—environment; 3, Life histories of principal pond fishes; 4, Studies on the fish parasites.

The first issue of 3000 copies proved to be so popular and was in such demand that it was practically exhausted in the first nine months; a new edition of 2000 copies has been authorized by the Commissioners and is now in press.

Maps of Imporant Lakes:—A supplement to the bulletins on the fishes has been published and may prove to be of great interest to the citizens of the State. It consists of some 63 maps that show the bottom contours of the more important lakes. These maps, (scale 1″ to 600′) are available to scientists, to property owners, to fishermen, to engineers, and others; they may be secured singly or in complete series in a convenient container.

The Diptera or True Flies of Connecticut, Bulletin No. 64:—An impressive volume on the flies of this region is now in press and will be available some time early in 1943. It was written by three different authors, all of them high in their professions: Dr. G. C. Crampton, an eminent insect morphologist, is able through his profound knowledge of their structures to place the morphology of the flies on a sound basis in the present work. The key to the families of the Diptera has been written by Dr. C. H. Curran of the American Museum of Natural History, New York City; he is a renowned authority on taxonomy and is author of a standard work on this subject for North America. The section on the primitive families of flies, the Tipuloidea, was composed by Dr. C. P. Alexander, rated the foremost authority on this subject; he presents a key to over 500 species, together with descriptions, the distributions, and a discussion with illustrations of the important structures; it will be the best work on this group ever published in North America.

This is the first fascicle on the flies and it is hoped that further descriptive literature, the other sections already in manuscript form, will be published as soon as the present great emergency will permit.

This first bulletin will be of great importance to any interested in the Diptera—layman, teacher or scientist; it will comprise about 500 pages and have sixty or more text figures and half-tone plates. The authors of this bulletin have spent much time and labor on their studies: Alexander's work includes five years of collecting in the State and his description covers many new species; it has been said that no other work on the Diptera of this importance and scope exists in this country.

As stated above the present bulletin will include the taxonomic treatment or classification of all families of flies; it therefore treats of a group of insects of tremendous economic importance because it describes those which are injurious to agricultural crops and to domesticated and wild animals; it includes species which are dangerous to man especially because they transmit such diseases as malaria, encephalitis, poliomyelitis, typhoid fever, et cetera.

Researches on the Cottontail Rabbits, Bulletin No. 65:—This manuscript, now in press, embodies the results of a major investigation carried on during the years 1936-1938. It was a project of the Connecticut Wildlife Research Unit and was supported by the American Wildlife Institute, the United States Biological Survey, the State Board of Fisheries and Game, and the University of Connecticut. The field and laboratory activities had for their purpose the determining of the characteristics, the habits, the means of managing the rabbit species and had for their incentive the fact that this is the most important game animal in the State insofar as annual take is concerned.

The studies included an examination of the distinctive skull characters that distinguish the two main species, covered their range in the State as determined by some 300 animals collected, dealt with the various cover types and the sizes of home ranges of individual animals. Both with wild and captive animals an intensive study was also made of the breeding cycle from gonad measurements and histological studies, of breeding habits and rate of growth, of the nature and extent of the moulting of the fur, together with a careful examination of internal parasites. The various lines of investigation combined with reference material offers the basis for a section on management practices.

UNPUBLISHED MANUSCRIPTS

Great satisfaction always attends the completion of a piece of research and the presentation of the results; it is, however, most disappointing if a manuscript must be held for months or years without publication. This comes to be a great misfortune for the people of the State if they are deprived of the benefits of the studies of one of our workers and it is, moreover, a calamity to

the author. There are several manuscripts in our files awaiting the printer and we urge upon the General Assembly or the proper officials of the State the importance of publication at the earliest possible moment.

Studies on the Spiders:—In 1936 Dr. Britton foresaw "an opportunity to obtain a comprehensive paper on the 'Spiders of Connecticut' by Dr. B. J. Kaston, Ph.D. (Yale)". At the time it was realized that this would be a four or five year study but now we have the manuscript in its completed form from the author; not only has he given generously of his own time, but he has received help from many individuals and institutions, and a considerable sum of money has been expended by the Survey in support of his work.

The typed manuscript on the spiders comprises 1000 pages; it includes 140 photographs and drawings and we have available approximately 60 valuable finished cuts furnished from the Emerton Fund of the Boston Society of Natural History for use in our bulletin. Over 600 spider species have been described and their life histories, habits, etc., have been recorded in this important manuscript.

There is promise of an early publication of this paper on spiders because of assistance offered by the Boston Society of Natural History. Not only the cuts but a fair sum of money will be provided from the Emerton Fund, when final authorization is made. Mr. Emerton did so much, many years ago, on the spiders and collected an interesting series of photographs of spider webs; these are ours to use.

The Geology of the Connecticut Valley:—We have in our possession the completed manuscript on a phase of Connecticut geology by Dr. Paul Krynine, now of Pennsylvania State College. The author took his graduate work at Yale University; after completing it he continued his interest in the geology of the State and did his field work and studies under the direction of Professors Knopf, Longwell and others; his is a study and treatment of one of the most extensive continental sedimentary deposits known to science.

This geological problem came to be a detailed petrographic and mineralogical investigation; the field and laboratory work was carried on in the years 1933, 1934 and 1935. The paper discusses certain controversial problems following up faithfully and completely the profound work of Barrell in earlier years; it treats of the climate and geography of pre-historic Connecticut, gives in detail the nature of the sedimentary processes, the source of the fluvial materials, the areas of their origin, the method of their deposition as well as the primary structures that have resulted. The headings of some of the chapters are as follows: Mineralogy; Stratigraphy; Sedimentary petrography; Structural features; Past climate; Sedimentation and genesis, and Paleogeography.

The Mollusca of Connecticut:—This is a basic paper, a check list of clams, oysters, and such of our State compiled by W. J. Clench and R. T. Abbott of Harvard University. The list will serve to facilitate the studies of the mollusks and will be followed by other papers descriptive and theoretical.

The investigation was inaugurated by Dr. Britton some years ago and its completion has been urged by Dr. Roger B. Friend, both of whom appreciated the importance of this study. It brings the nomenclature and records up to date of a group of animals little understood as to their habits, growth, usefulness, etc. It is well known that they are eaten by man; but they also constitute an important food for fishes, game birds, and even small mammals; their destruction might affect the welfare of all of us; the parasites they breed and distribute might have a profound effect on many animals. Snails, for instance, are both carriers of germs in certain stages of their life history and are also indicators of pollution in our lakes and streams.

Here is a paper, a first step in the study of mollusks, that may have great importance in the economy of man.

Other Studies on the Flies:—Investigations are being carried on by various scientists working for the interest of the State, for instance these: Common and Conspicuous Plant Galls, by B. H. Walden; The Acarina or Mites, by Philip Garman.

Of more immediate importance, however, are the completed manuscripts, a dozen of them, on the various families of the flies, worked out largely under the direction of Dr. Britton and Dr. Friend of the Agricultural Experiment Station. This work is supplementary to, or along the same lines as, our First Fascicle on the Diptera, Bulletin No. 64. When it comes to the publication of them, some of these papers may well be combined into one bulletin, but there is a pressing demand and need that they be made available to scientists everywhere.

The following facts may help us in appreciating the importance of the flies to our welfare and the necessity for more knowledge of them. Injury often comes to useful plants by the flies; they bring diseases to man; by them parasites are transmitted to domestic animals; some even carry venom and their bites are painful and poisonous. Many other flies produce galls, cause food to deteriorate, destroy the wheat, apples, cherries; some of them mine into the birch and maple trees; some cause carrot rust, or produce maggots that infest cabbage, seed corn and onions; the crane fly is a pest on the tobacco plant, eating the parts underground.

One of the timely manuscripts ready for publication when funds are available was written by Dr. Matheson; this treats of the Culicidae, the mosquitoes. These insects are always of great importance to us but now there comes word that an outbreak of encephalomyelitis, a kind of sleeping sickness, has appeared in New England, the disease having been spread from horses to man by native mosquitoes hitherto considered harmless.