122d ANNUAL REPORT

of the

NEW YORK STATE MUSEUM AND SCIENCE SERVICE

July 1, 1959—June 30, 1960

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MUSEUM BULLETIN NUMBER 385

The University of the State of New York
The State Education Department
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THE UNIVERSITY OF THE STATE OF NEW YORK

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The Staff

State Museum and Science Service

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ROBERT E. FUNK.....Junior Scientist (Archeology)

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PAUL CONNOR.....Scientist (Zoology)
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LEO M. HALL.....Scientist (Geology) (Temporary)
Y. WILLIAM ISACHSEN.....Associate Scientist (Geology)
W. LYNN KREIDLER.....Senior Scientist (Geology)
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Marion B. Bender.....Clerk
Joan A. Creech.....Stenographer
Emily W. Dixon.....Typist
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Roselle Lithgow.....Clerk
Marjorie R. Schmidt.....Principal Clerk
Margaret Slater.....Senior Stenographer
Mary C. Stearns.....Stenographer
Eileen A. Wood.....Senior Stenographer

Guards

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Francis J. Lynch.....Museum Guard
William C. Zimmer.....Museum Caretaker

Photographer

John Heller.....Museum Photographer

Nelson D. Powers.....Maintenance Helper
Jacob Smallenbroek.....Carpenter
James Wiedemann.....Maintenance Man (Carpenter) (Temporary)

General Statement

I HAVE THE HONOR TO SUBMIT a report of the major activities and accomplishments of the New York State Museum and Science Service for the year ended June 30, 1960. The activities of the year covered by the 122d Annual Report are best expressed in the individual reports of the scientists and Museum curators, the exhibits and the educational staff. My own report of stewardship of these activities reiterates programs that I have proposed in staff conferences and accomplishments reported to the Commissioner.

Because I believe that research museums such as ours are essentially communities of scholars, considerations of the staff take first precedence. As I have written elsewhere, it is the essential character of the research museum that collections accumulate as a byproduct and directly reflect the research interests of scientists. As the years go by and scientific collections grow, they then become a resource for research, the museum attracts scientists, and it attains stature proportionate to its resources and its publications. A public museum is, moreover, an outgrowth of its own services. Reputations of museums are ephemeral and must be constantly validated. As long as a museum maintains a research program and continues to publish, it will hold its staff and its reputation in the scientific community. It is important, therefore, that we give some consideration to the labor market for museum scientists.

Salaries are rising for academic posts in universities having similar qualifications as curators in the State Museum and scientists in the Surveys of the State Science Service. We can no longer meet the competition for new personnel nor are we promoting seasoned scientists so rapidly as the universities. Recently, the directors of 22 leading science museums have urged the adoption of standards for classification and salaries of curatorial positions in research museums equivalent with academic grades and titles in nearby colleges and universities, so that curators equal full professors; associate curators, associate professors; and assistant curators, assistant professors. For two years a plan has been advanced to the Department requesting that our top professional positions be raised to meet the competition of full professors who are chairmen of departments in universities, and our top research scientists should equal the salary level of teaching professors.

The Establishment

The Department has taken a long stride forward in providing new laboratories for the scientists of the State Science Service. The addition of the wing to the Education Department is, for the Museum, the first extension of its facilities since the Museum was originally opened in the present building. The new laboratories occupy the ninth floor of the wing and are connected to the fifth floor of the Education Building at the back of Biology Hall by a bridge. The arrangement of the laboratories and offices is the work of a committee which was headed by Dr. John G. Broughton, State geologist, who spent a considerable part of three years in planning the laboratories and selecting suitable equipment. The laboratories which were nearing completion in June were entirely financed and furnished by the State of New York. Grateful acknowledgment is made to Deputy Commissioner E. B. Nyquist for advancing our claim and to the Division of the Budget for awarding the funds. Elsewhere in the report we express regret that a team from the National Science Foundation which looked over our facility did not make us an additional grant from its facilities fund to purchase cases for the collections that have been dislocated by the move and to provide subprofessional help for the curators. They did, however, express admiration and approval of what we had accomplished with our own resources.

The Museum

Attention is called to the report of the Museum which indicates that attendance has declined from a high of 175.000 last year by some 16½ percent. Various theories have been advanced for this decline: It has been ascribed to a shift in statistical methods, it has been ascribed to a change in travel patterns of the American public, and it may be owing to other factors beyond our ken. One thing is certain: In the next year we must undertake a survey of our visitors to ascertain their origins, whether they come back repeatedly, what age groups of the population they represent and what sectors of the taxpayers are being served by the Museum as an educational facility.

Visitors returning to the Museum after several years remark on the very real progress with exhibits. This section of the report speaks for itself.

We are particularly proud of the new herbarium which was created at the rear of Biology Hall adjacent to the new wing. This gain in research space meant a loss of exhibit space, but it was accompanied by an improvement in the bird and mammal exhibits. Although the workspace

may not be the botanists' ideal, at least we have the only herbarium in the civilized world that has glass cases filled with domestic poultry visible to both guests in the exhibit halls and to botanists within the herbarium!

State Museum Advisory Council

The plight of cities is reflected in the inability of the present tax base to support educational programs of city museums over and above the need of the public schools, and the museums in our large metropolitan centers are serving wider audiences of school children than the narrow area of municipal tax support. This situation was called to the attention of the reading public last winter in a series of editorials in the *New York Times*. At its spring meeting, the State Museum Advisory Council recognized this problem and recommended three things: a new set of regulations for chartering museums, a definition of "museum" to serve as the basis for new legislation to protect educational establishments from encroachment by the entertainment industry, and the establishment of a Commissioner's Committee on Museum Resources. Simultaneously, the council and its invited guests, who were directors of representative museums in all parts of the State, commenced a movement to form a New York State Association of Museums to seek these ends.

State Science Service

Within the next year we may look for a change in the kind of work that the Science Service will undertake in its new laboratories, equipped with the latest devices. Immediately, there will be a shift from 19th century methods of observation to quantitative research and the more accurate identification of materials with new instrumentation. Look also for increased visitation and use by scientists from nearby universities who have already applied to use the new facilities. In the future the museums will do more of the nation's research as universities fill up, teaching loads increase and professors have less time for work in their own laboratories. They will want permission to work in Museum laboratories. We do have some available bench space.

The work of the scientific surveys is detailed in the reports that follow. In 1956 we stimulated work on the Iroquoian languages of New York, and Dr. Wallace L. Chafe, who was then a graduate student at Yale University, undertook a study of the Seneca language. He has since gone on to join the staff of the Bureau of American Ethnology, Smithsonian Institution, and has completed the work in the present year. To extend supervision and advisory services over a much wider area of the State, the State archeologist has been joined by a junior scientist to

work on highway salvage archeology. He will also work cooperatively with the Department of Public Works and the Federal Bureau of Roads.

Biological research moved ahead on three fronts. After two and a half years of intensive study and trial, the State botanist has discovered a way of tagging ragweed pollen so that he can count it by the introduction of radioisotopes into the sap stream. To do this, he has designed and constructed new pollen samplers which are perhaps the best in the world. In entomology, research is continuing on the white pine weevil which is the primary enemy of an important native tree. A report of these investigations has been completed for publication. In the Adirondacks punkies continue to be a nuisance insect, and attempts to control them in the past have failed for want of knowledge of their biology. With a grant of $7.000 from an anonymous donor. our entomologists have now worked out the life cycle of these insects and have some ideas about control. The State zoologist has completed editing the first volume of the *Bird Handbook*, a manuscript of over 1,000 pages for publication by the American Ornithologists' Union. A bulletin on the small mammals of Otsego and Schoharie Counties summarizes our participation in an interdepartmental project to investigate the disease rabies.

The major effort of the Geological Survey during 1959-60 was directed toward the compilation of its new State Geological Map. This project is now in the compiling stage which has entailed a great deal of final fieldwork and use of the literature. Our oil and gas geologists in Albany and in the Wellsville office made two significant contributions to the industry by publishing two reports: *Selected Deep Wells and Areas of Gas Production in Eastern and Central New York* and *Correlation of the Silurian Rocks of New York State*. A third interesting development has been the participation of the State geologist in the work of the State Office of Atomic Development.

Cooperation

The Museum was host to the American Folklore Society in August. an event which gave the community pleasure and was the occasion of a special exhibit in the Museum for which we prepared a special brochure. Albany is a good community in which to hold meetings of small learned societies. With the new seminar rooms in our new laboratories, we are planning to bring meetings of 50 to 100 people in the several sciences which we represent in an effort to give leadership to hitherto uncoordinated efforts.

It is always pleasant to go abroad to cooperate with one's colleagues in other museums. At the invitation of the Royal Ontario Museum, I

appeared on the CBC program "Who Knows?" on August 14, and visited an anthropological field party near Toronto.

Our visitor of the year was our colleague, the director of the Rijksmuseum, Amsterdam, Holland, Dr. T. H. Van Luttervelt, who accompanied an exhibit of Flemish paintings, a feature of the Hudson-Champlain Celebration, to the Albany Institute of History and Art.

Because we believe that research in anthropology should carry over into the improvement of the quality of teaching in the social studies, we met and addressed the State supervisors of citizenship education at their Albany conference. We also cooperated in the preparation of an educational TV program that ran for two successive weeks on WPIX in New York. This effort entailed many hours of tutoring and planning with Harvey Zorbaugh, the teacher and script writer, and with David Reese of the State College of Education, Albany, who made the films. The classes of the air made a visit to the State Museum to view the life groups of Iroquois Indians as they lived in 1600; they were taken on a field trip to the Tonawanda Reservation, seeing Senecas as they were a generation ago; and the camera took city viewers into integrated classes such as Indian children now attend in the Akron Central School; and the city children heard a panel of Indian parents discuss educational issues with their principal. We acknowledge our indebtedness to Edward E. Allen, supervising principal of the Akron Central School, to Chief Everett Parker and to our colleague, Francis E. Almstead.

The Museum education staff made a further effort toward improving the teaching of social studies and natural history by assisting publishers to select pictures of the unique objects in the State collections for illustrating books. An example resulting from this type of collaboration is the special edition for young readers of the *American Indian* by Oliver La Farge (Golden Press, New York, 1960).

Permission was granted to York State Film Strips to include views and individual exhibits of the Museum in a series which aims to prepare classes for the visit to Albany. This medium promises to take the Museum and its collections to classrooms throughout the State and beyond. We helped edit and caption seven filmstrips on the *People of the Longhouse* which introduce the concepts of a culture and a society into the teaching of the Indian in the social studies curriculum.

In such collaborative undertakings with media beyond our means and control, the policy is that production costs, including special photography, are borne by the producer; where original written contributions are required of specialists, they are undertaken out of hours on the writer's option.

Some of us who have had a concern about the place of research museums in the national picture agreed to participate in a symposium on "The Role of the Research Museum in Science," which was held at the 55th Annual Meeting of the American Association of Museums, Boston, May 27. Prior to that, the more important anthropological collections in the eastern United States were visited, curators and directors were interviewed, and the results were compiled in a paper on "The Museum and Anthropological research."[1]

There were a few staff changes during the reporting period. Terry W. Offield resigned as scientist (geology) September 9 and the position was filled provisionally January 14 with the appointment of Leo M. Hall. The position of assistant librarian (Mrs. Eileen Coulston, who has been so helpful to the scientific staff on reference work) was reclassified to junior scientist January 28. Robert E. Funk was appointed provisionally June 2 to the newly created position of junior scientist (archeology), and Janet L. Stone received permanent appointment as Museum education supervisor June 16.

Having spent six years in getting our own house in order, we are now preparing to move ahead into a wider area of service, in research by the staff in new laboratories, and in enabling our sister institutions of the State to take a more vigorous role in the education of school children and in continuing education beyond the schools.

WILLIAM N. FENTON
Assistant Commissioner for
State Museum and Science Service

[1] *Curator*, v. 3, No. 4, 1960, pp. 327-355

Accomplishments of the Surveys

Anthropological Survey

Field Research

THE STATE ARCHEOLOGIST continued his studies of settlement patterns with major excavations centered in the Sackett site at Canandaigua and the Maxon-Derby site near Jordan. Both sites belong to the prehistoric Owasco culture. Small, circular, single-family dwellings were indicated for the former, while on the latter were uncovered the ground plans of large, oval or rectanguloid communal dwellings, suggesting possible longhouse prototypes. Four college student assistants aided in these investigations during July and most of August. In the late summer and early fall reconnaissance projects involving various amounts of excavation ranging in duration from one to ten days were undertaken in the following areas; Piffard, Livingston County; Jefferson County, especially on Grindstone Island and around Perch Lake; near Savannah, Cayuga County; Croton Point and George's Island, Westchester County; Fulton and Washington Counties; and outside the State in Rutland County, Vt. In the spring of 1960 an important Archaic period site near Scotia, Schenectady County, was excavated for a two-week period, with the active cooperation of members of the Van Epps-Hartley Chapter, New York State Archeological Association.

Artifacts of the Dorset and Sarqaq cultures in the eastern Arctic were studied at the Peabody Museums in Cambridge and Andover, and at the American Museum of Natural History in connection with the preparation of a paper for the annual meeting of the Society for American Archaeology.

Laboratory Analysis

Typological studies and formal descriptions of 25 projectile point types were prepared, and a manuscript covering more than 30 such types was completed under the title of *A Typology and Nomenclature of New York State Projectile Points*. It will be published as a Museum bulletin. Field notes were processed, maps were made, and data were analyzed from the excavations on the Sackett and Maxon-Derby sites. In addition, analyses were completed on borrowed site collections from Ketcham Island, Vt., and the Hoosic Valley in New York. Potsherd series were typed for several amateurs and colleagues.

A Science Service archeological field party uncovering house floor outlines (marked by stakes) at prehistoric Owasco culture site on Maxon-Derby farm, Jordan, N. Y.

Office Activities and Administration

The State archeologist wrote nine short articles and abstracts for *American Antiquity*, *Teocentli*, and other journals and papers for annual meetings of the Society for American Archaeology, Eastern States Archeological Federation, and New York State Archeological Association. He interviewed 246 local or out-of-town visitors, including professional colleagues, students and amateur archeologists.

Cooperative Work

The State archeologist served as chairman of local arrangements committee for the annual meeting in Albany of Eastern States Archeological Federation and chaired one afternoon session. He also was chairman of a committee on chapters and membership, New York State Archeological Association, and brought one new chapter into the organization.

Assistance was given to several university research fellows, advanced students and others with archeological problems and dissertations, and numerous nonprofessional archeologists were advised concerning site investigations, analysis and interpretation of their finds, and preparation of reports. Manuscripts were read for several professional colleagues and one university press. Seven petitions for grants-in-aid were evaluated for the National Science Foundation, and data were prepared on New York archeological sites for the National Park Service.

Human remains were identified for the New York State Police Laboratory from five localities and for the curator of the Fort William Henry Museum.

Under a cooperative arrangement with the Smithsonian Institution, Dr. Wallace L. Chafe, linguist of the Bureau of American Ethnology, during July and August completed fieldwork on the Seneca Indian language. This language is one of the most important survivors of the Iroquoian family, which is still spoken at Tonawanda, Cattaraugus and Allegany reservations in western New York. The publication terminates work begun under our aegis in 1956 when Chafe was then a graduate student at Yale. His completed reports are awaited with interest. His publishing plans include a grammar and dictionary of the Seneca language, to be submitted to the Smithsonian Institution press. He will also publish a glossary of the most common terms in Seneca for use by anthropologists, historians and teachers to appear as a bulletin of the State Museum and Science Service.

In cooperation with The University of Buffalo and the Buffalo Museum of Science, and with support partly from the State Science Service,

Dr. Marian White continued field reconnaissance and excavation of early Iroquois sites in Erie County.

A committee consisting of Wallace Chafe, Elizabeth Tooker and Marian White was appointed to plan and conduct the 12th Conference on Iroquois Research, which was held at Red House in October.

Biological Survey

With the continuing aid of research grants and other material assistance from outside sources in each of the Units of the Biological Survey, substantial progress was made on several projects. The first two months of this report period. July and August 1959, represented the active period of the second season of work on the tagging and sampling of ragweed pollen (a project supported by the National Institutes of Health) and the most active period of the first season of research on biology and control of "punkies," a project made possible by a grant known as the Adirondack Entomology Research Fund.

An important accomplishment was the sending to press of the first of five volumes of the *Bird Handbook*, a monumental work which is being compiled and edited by the State zoologist. The project receives its major outside support from the American Ornithologists' Union.

Also, during this period, the data from several years of a cooperative project with the State Conservation Department, the study of white weevil attack as related to soils in New York State plantations, were compiled and submitted for publication as a Museum bulletin.

Field Research by Projects

Botany

Identification of aquatic plant fragments using anatomical characters. Eighty-four of the approximately 250 species of aquatic vascular plants in the State have been collected and their stems, rhizomes, roots, leaves and peduncles are in various stages in the process of preparing microscope slides.

Survey of airborne pollen grains and fungus spores. Described in the last previous annual report as "completed, with a final report in press." This report comprises Museum Bulletin No. 378, by E. C. Ogden and D. M. Lewis, entitled "Airborne Pollen and Fungus Spores of New York State," issued in January 1960.

Ragweed pollen content in the air in relation to weather conditions. The paper described in the last previous annual report as "ready for publication" was published in the Journal of Allergy for

July-August 1960 entitled "Field Evaluation of Ragweed Pollen Samplers" by E. C. Ogden and Gilbert S. Raynor. (It is not cited on p. 62 because it was not published until after the period covered by this annual report.)

Pollen spectra of lake and bog sediments. The Crusoe Lake station was revisited, and samples were taken by D. M. Lewis and D. D. Cox from two levels for possible radiocarbon assay. Pollen diagrams for the three sites at this station were completed, and an outline of the findings has been prepared. A final report must await studies now being carried out by the State archeologist. The pollen of 30 species most represented in our reference collections was obtained, and approximately 100 reference slides were prepared from previously collected material.

Tagging and sampling ragweed pollen. This project is in cooperation with Brookhaven National Laboratory and is supported by a U.S. Public Health Service grant. A technique for labeling ragweed pollen in the anthers, so that its release to the air and its buoyancy are not modified, has now been perfected. It involves the use of radioisotopes—radiosulfur or radiophosphorus. Pollen samples taken in the area are processed to produce autoradiographs which readily distinguish tagged and untagged pollen. Several new designs of pollen samplers were constructed and tested in and around a one-acre field of cultivated ragweed and on two nearby meteorology towers. Still further modifications in samplers are being readied for the 1960 hay fever season. A wind tunnel has been constructed for sampler testing under controlled windspeeds. A complex isokinetic sampler, to be used as a check, is nearly completed.

Checklist of the grasses of New York State. In the course of exploring and collecting for vascular plants in general (see next project), an attempt was made to add to our knowledge of grasses. Eighty specimens were collected, representing 69 numbers, in addition to abundant records on common species and detailed observations on critical complexes, particularly in the genera *Festuca* and *Agrostis*. Three days were spent at the National Herbarium in Washington checking nomenclature and problems in the genus *Panicum*. Work on the checklist is 98 percent completed.

General survey of the vascular flora of New York State. Exploration of the State for vascular plants was continued with special trips made to central New York and Long Island. Records (either sight or those supported by specimens) were made in the following counties: Albany, Cayuga, Columbia, Dutchess, Essex, Fulton, Greene, Herkimer,

Montgomery, Nassau, Oneida, Onondaga, Oswego, Rensselaer, Rockland, Saratoga, Schenectady, Schoharie, Suffolk, Ulster, Warren and Wayne. The work was assisted in the field by Gary Griffin, during the summer of 1959.

Entomology

Biology and control of Culicoides (punkies). This was the second season for the project, which is supported by the Adirondack Entomology Research Fund. Studies made in 1959 indicated that *Culicoides obsoletus* was the only species that commonly attacked man in the Adirondacks. The breeding habitat of the species was unknown, and it was not located until the second season. Although conclusive data have not yet been compiled, the following observations were made:

1. Six percent DDT in a fuel oil solvent applied by mist blower to plots of 1 or 2 acres reduced biting populations to a low level for several days in each of five plots.

2. *C. obsoletus* adults were killed by an 8 percent DDT fog, and biting adults were almost entirely eliminated for the period from dusk to dark by fogging a strip 100 feet long.

3. Malathion emulsion (5.7 percent with corn syrup added as bait) applied by mist blower to a two-acre plot did not appreciably reduce the number of biting adults.

4. Solutions painted on window screens to affect punkies attempting to enter houses were tested, and some of them appeared to offer real promise. DDT did not kill fast enough, however, to prevent flies that entered from biting. Malathion gave better results, but further work is necessary to perfect and test different formulations.

Eastern encephalitis vector studies. During the fall of 1959 the virus of eastern *encephalitis* ("EE") was isolated from ducks on Long Island. At about the same time, in New Jersey several human cases occurred, and it was strongly indicated that mosquitoes were the vectors. In a survey conducted by the entomology office of the State Science Service, breeding places of the principal mosquito vector suspect, *Culiseta melanura*, were found in the area where duck farms were numerous. After a joint meeting with State Health Service and other agencies, the Biological Survey agreed to establish a field laboratory to determine the actual vectors of EE on Long Island, to study host relationships and to make other related biological and epidemiological studies. The Long Island Duck Research Laboratory (a unit of the State University Veterinary College) furnished laboratory facilities at their estab-

lishment near Eastport, and the Suffolk County Mosquito Control Commission arranged to pay the salary of a temporary research expert during the summer. Both the duck laboratory and the State Health Department Division of Laboratories and Research arranged to process the vector samples to detect the virus. In addition, the site of the small mammal survey of the Museum and Science Service has been transferred to Suffolk County, partly so that the work can be associated with the encephalitis studies. With these arrangements the eastern encephalitis vector survey began its activities toward the end of the present report period.

Blackfly studies. One test of a suggested biological control agent (*Bacillus thuringiensies*) was made. A commercially prepared powder (Thuricide) was applied to a stream over a 20-minute period at the rate of about 0.5 ppm. Blackfly larval populations, primarily *Prosimulium hirtipes*, were not affected.

Beech scale studies. Collection of data in the fall of 1960 will complete a 10-year study of beech scale and its association with *Nectria* disease. Field observations in the study plots indicate that the scale-*Nectria* association can be very destructive to beech in the Catskill Mountains. It is hoped that data collected and their analyses may show under what conditions the scale and fungus are most destructive and, by inference, how they may be avoided.

Gypsy moth experimental sprays. Experimental airplane sprays in 1959 and the spring of 1960 indicate that Sevin at 1 pound in 1 gallon per acre (in fuel oil) is as effective at ½ pound DDT in 1 gallon per acre (in fuel oil).

Gypsy moth biological studies. Biological studies of the gypsy moth carried on by Robert Campbell (temporary research expert) in the Glenville plots near Scotia were concluded, at least temporarily.

White pine weevil spray. In 1959, in tests with a portable mist blower, 6 percent DDT and 4 percent lindane plus 4 percent aroclor in emulsion form gave satisfactory results when directed toward the leaders of white pine. The 1960 tests using 6 percent DDT and 6 percent DDT plus 1 percent aroclor at 3 gallons per acre look very promising. DDT was selected over lindane because of lower cost. Weevil counts after spraying showed a heavy reduction of adult weevils in the spray plots as compared to the check plot. The sprays in 1960 were applied to four rows of trees at one time as compared to one row at a time in the 1959 tests. In both years the spray was aimed at the leaders.

Specially constructed cages set up at a field station for study of diseases and parasites of the gypsy moth

European pine shoot moth. In 1959, using the portable mist blower, tests were made with 6 percent DDT plus 6 percent Arochlor, 6 percent Sevin and 6 percent Arochlor and 2 percent Thiodan plus 2 percent Arochlor. Application was made when 73 percent of the moths had already emerged. One percent Thiodan was ineffective; the DDT gave a 63 percent reduction over the check and the Sevin a 78 percent reduction. Thiodan (2 percent) was ineffective. In 1960, 6 percent DDT and 6 percent Sevin (both with 3 percent orthospray sticker) in water (½ pound insecticide per gallon) applied at the rate of 4 gallons per acre were applied to infested red pine. Results of tests will be analyzed this fall. Sprays were applied before moth emergence.

Matsucoccus scale. A spot check survey of *matsucoccus* scale along the Hutchinson River Parkway and on Long Island showed that it had not spread easterly on Long Island beyond Commack, but westerly it has spread to the New York City line. In Westchester the scale is more widespread in the southern half of the county but has not made further progress north or east along the Hutchinson River Parkway.

White pine weevil attack in relation to soils. The observations have been compiled and analyzed. A final draft of the proposed bulletin has been prepared.

White pine weevil fertilizer tests. In tests with several fertilizer formulations, begun in the fall of 1958, no relationship between weevil attack and the nutritional factors associated with the fertilizer has been found. Observation in the fertilized plots will continue for another year.

Forest tent caterpillar. In the spring of 1960 an infestation was discovered in the Catskills, and it is planned to use the sequential sampling plan in survey work next winter. (Sequential plan was described in New York State Museum Bulletin No. 366).

Identification and classification of the leaf beetle, family Chrysomelidae. This work is a continuation of projects described in more detail in the annual report for 1957-58. The objectives are a revised taxonomy of the *Chrysomelidae*, a catalog of North American species, keys to the identification of American species and a bibliography.

Manuscripts covering these projects are practically complete. However, considerable work has been done by other entomologists on the South American Chrysomelidae. Rather radical changes in taxonomy and many new genera have been added to the lists of Chrysomelidae, and it is felt that a more thorough study of the literature and an examination

of representatives of the neotropical fauna should be made before any extensive publication is issued on the North American insects.

Biology of the gypsy moth and other forest pests. The work consisted of field observations and identification of insects. Many of the pests were identified in the State Museum; others, parasitic flies and wasps in particular, were sent to specialists for identification.

Zoology

Small mammal survey, Otsego County: Studies in an area sprayed with Sevin. Small mammal trapping and observations on other wildlife, begun in May 1959, was continued until July 16, 1959; a previous report summarized the work. In this area in July, 115 mammals of all species were taken in live and snap traps (800 trap nights).

Lewis County: Collecting on the Tug Hill Plateau. The move to the new area (headquarters near Lowville) was made early in the report period. Objectives included preparing specimens of Tug Hill small mammals, preserving parasites and accumulating ecological and biological information on the mammals. Bird observations also were made in this little-known area. Trapping was conducted in all months except March; work on the plateau summit was slower, but continued, in midwinter. Mouse and rat trap nights totaled about 10,000 by June 1960. Measurements, reproductive data etc. were recorded for about 700 mammals. During late winter laboratory analyses were made of many of the stomachs collected up to that time. Two caves were visited in Jefferson County but no bats found. James E. Brower, student, began work as summer assistant on this project on June 1, 1960.

Handbook of North American Birds. Volume I went to press early in 1960. It consisted of 1,091 manuscript pages, 44 text figures, 80 range maps and 6 color plates. Twenty-four authors provided major contributions. Minor contributions and various forms of assistance from about 60 other people also went into the production of this volume. The curator of zoology made the distribution maps.

Office Activities and Administration

In all the offices the personnel took time to answer the usual professional correspondence and correspondence with persons having problems with control of pests. In entomology, termites, stored products pests, mosquitoes and other biting flies appeared to cause the most concern. Requests for advice and for personal appearance of staff members to talk about mosquito control have increased until it is difficult to fit them into the program.

Geological Survey

The immediate effort of the Geological Survey during 1959-60 was directed toward the compilation of its new State Geological Map. This involved correction of the base map mosaic, fieldwork during the summer of 1959, much analysis of the literature and the reduction of data to preliminary maps. In anticipation of the transfer to new offices and laboratories in the wing of the Education Building, a great deal of time was devoted to the analysis and choice of suitable laboratory equipment.

An important increase in gas exploration and development led to equally increased activity for the Wellsville office of the Geological Survey. A well-received contribution to the oil and gas industry was a complete compilation (with maps) entitled *Selected Deep Wells and Areas of Gas Production in Eastern and Central New York* (Bulletin No. 373). "Correlation of the Silurian Rocks of New York State" initiated a newly established map and chart series and was the first of a contemplated sequence of correlation charts of the geologic periods of New York State.

Another activity of unusual interest lay in the application of geology to problems of the atomic age: location of hardened industrial sites. storage of radioactive waste and the correlation of natural radioactive background to congenital malformations.

Field Research

Fieldwork of permanent employees was again concentrated on geological mapping, both for the purposes of the State Geological Map and in greater detail in areas of particular interest. Investigations of mineral resources were also carried on. This work was done both by permanent staff members and by geologists temporarily employed for the summer months.

Geological reconnaissance in the Adirondacks. The field season of 1959 was devoted to geological reconnaissance of the Old Forge and Big Moose 15′ quadrangles as well as preliminary work in the West Canada Lakes quadrangle. These areas have been terra incognita, and knowledge of them was essential for the State Geological Map.

Detailed studies of metamorphism in Dutchess County. In connection with a study of progressively metamorphosed shales, samples were systematically collected and selected rocks have been thin sectioned. This will develop into a major research program involving the bulk composition and transfer of trace elements within these rocks of progressive metamorphic grade.

Cooler temperatures do not handicap fieldwork. Here is a New York Geological Survey geologist, well protected from chilling winds, examining the Rensselaer graywacke near East Nassau.

Spot checking for the State map. About three weeks were devoted to fieldwork, mostly in the Taconic region of New York, spot checking the geology of small areas for which knowledge was needed for the State Geological Map.

Fieldwork in the Devonian and Taconic rocks of New York State. Approximately one month was spent working with various geologists on problems of the Upper Devonian and Taconic rocks in central and eastern New York State.

Geologic mapping in Orange County. Geological mapping of the Greenwood Lake and Goshen quadrangles in Orange County was continued. Contributions were made to an understanding of the geology of the Peekskill and Tomkins Cove areas.

Fieldwork of Temporary Personnel

Investigation of limestone by counties. During the 1960 field season work was resumed on the limestone survey. John H. Johnsen of Vassar College began work on a regional report summarizing the geology of limestone in St. Lawrence, Lewis, Jefferson, Herkimer and Oneida Counties.

Taconic geology of eastern New York. Donald Potter of Hamilton College, assisted by Timothy Hall during the summer of 1958 and by John C. Lawrence during the summer of 1959, continued mapping in the Taconic region of Washington County. Well over three quarters of the Hoosick 15′ quadrangle have been completed.

Upper Devonian rocks of central and eastern New York. Dr. Robert Sutton of The University of Rochester continued his investigations of the Upper Devonian rocks of central and eastern New York. This has resulted in detailed stratigraphic correlation of great value for the State Geological Map and in deciphering those geological structures that are of interest to the oil and gas industry. During the 1959 field season coordinated studies were carried on not only by Sutton, but by University of Rochester graduate students Elmer Humes, Frederick Manly and Robert Nugent. During the 1960 field season Sutton was assisted by Frank Fletcher and Daniel Twigg.

Glacial geology of western New York. Mapping of Pleistocene surficial deposits continued in western New York under the direction of Ernest H. Muller of Syracuse University. His immediate aim is the completion of the glacial geology west of the Genesee River so that a start can be made on a glacial map of New York State. Work done during

the 1959 field season was in Genesee and Orleans Counties. During 1960 fieldwork was carried on in Cattaraugus and Wyoming Counties.

Knickerbocker Project. A restudy of the geology of the New York City metropolitan area begun in the fall of 1957 has resulted in the completion of the geology of the borough of Manhattan. The data are now being prepared for publication. During the 1960 field season work began on compilation of data in the Bronx. The project is directed jointly by Charles H. Behre, executive officer of the department of geology at Columbia University; J. G. Broughton, State geologist; and Kurt E. Lowe of the College of the City of New York. Dr. Lowe is directly supervising the activities of the geological compilers who have collected a mass of information from State and municipal offices and from private engineering concerns dealing with geology and engineering.

Spot checking for State Geological Map. Approximately 14 days were spent by Lucian B. Platt doing reconnaissance geology in the 7½′ Cambridge quadrangle. Geology of the Tug Hill Plateau and, specifically, the Oswego sandstone in that area were studied by William Kruger. Ten days were devoted by Dr. Tesmer to tracing the Cuba sandstone in western New York.

Laboratory Work

Because of the need to complete the State Geological Map, the efforts of permanent staff members have been concentrated toward obtaining data for the map and accompanying correlation charts.

The paleontologists have been engaged in work on the Devonian and Cambrian charts which are nearing the stage when they may be sent to critical readers. The Ordovician chart is only in preliminary form pending the outcome of research not yet completed. The senior scientist continued drafting stratigraphic horizons on 1:250,000 maps in order to facilitate the selection of units to be shown on the final draft. The work was considerably advanced through the use of geologic maps of northern Pennsylvania obtained by loan from the geological survey of that State.

Work continued on the companion volume to Bulletin No. 373, *Selected Deep Wells in Areas of Gas Production in Eastern and Central New York.* The material on western New York, when published, will be of even larger size and greater use. All skeleton logs plus 98 percent of the map work was completed during the last fiscal year. Some field checking is necessary in order to outline the activities of the Medina gasfield. Subsurface mapping of the Onondaga limestone was initiated by the preparation of isopach maps. Work was also carried on in this

line by the senior scientist (paleontology) who worked on the preliminary structure map for the top of the Onondaga and the base of the Tully as well as a preliminary isopachous map of the Hamilton group.

The file of gamma-ray, neutron and electric logs begun a year ago is increased as the records are made available by the oil and gas industry. A project of considerable importance in the oil and gas work is the location of wells on 7½′ quadrangles. Previously these have been shown on 15′ quadrangles with some loss in accuracy. Transfer of data was carried on by William Turner, a student at R.P.I., and Paul Graziade, a student at Notre Dame. Considerable progress was made on this project. Preparation of the manuscript concerning the bedrock geology of the Richfield Springs and Cooperstown quadrangles is in progress. This is a joint project of the senior scientist (paleontology) and Donald H. Zenger of Cornell University.

The State paleontologist completed a typescript on tentaculitids, hyolithids, cornulitids, coleolids and other miscellaneous shells of uncertain biologic affinities. His manuscript, with illustrations by Mrs. John Winslow, will be published as part of Volume W of the *Treatise on Invertebrate Paleontology*.

Under the direction of Arthur Van Tyne, almost 34,000 feet of well samples were collected. The samples are a valuable source of information on the subsurface rocks in New York State and finds a wide use by individuals and companies. During the last fiscal year temporary personnel was hired to cut these samples and put them in better form for use. The total footage cut was 32,846 feet. Our present excellent position in regard to samples cut and the ease with which visitors can consult this important source of information is felt to justify the small expenditure necessary to complete the job. Other office work entailed compilation of data on well-plugging procedures for legislative committees working on the oil and gas law, preparation of the subsurface structure map of Allegany State Park area for use by the State Attorney General's office in connection with legal proceedings against the State of New York and compilation of a report on characteristics of oil and gas reservoirs of the State for a report on a study by the American Association of Petroleum Geologists.

The State geologist continued to act as consultant to the Office of Atomic Development and also was appointed to a subcommittee of the Atomic Development Commission on site location for nuclear development. This involved location of sites for storage of radioactive waste, nuclear reprocessing plants, high flux test reactors and an atomic port for New York State.

Office Activities, Administration and Special Travel

Broughton and Kreidler served as consultants to the Joint Legislative Committee on Interstate Cooperation concerning proposed legislation on conservation of oil and gas, offshore drilling activities and the underground storage of petroleum products, and the former prepared a report on the mineral resources of the Lake Champlain Basin for the September meeting of the committee at Westport. Acting on staff advice, the State geologist approved a number of oil and gas leases which were negotiated between the State Conservation Department and private industry. The annual contract between the U.S. Bureau of Mines and the Geological Survey concerning collection of mineral production statistics was negotiated and approved.

The annual Geological Newsletter was compiled by all staff members. The entire staff of the Geological Survey carried on extensive correspondence with private individuals and concerns relating to identification of and information on fossils, minerals, rocks, maps, ores, and oil and gas wells.

A new development was the use of X-ray diffraction for mineral identification. A recordkeeping system was initiated and storage facilities were developed for irradiated samples and their respective zones. Eighty-seven mineral samples were run on the X-ray unit resulting in the identification of almost as many minerals that otherwise would have remained unidentified.

The associate scientist (geology) edited several manuscripts and prepared a mineral data sheet for publication in *GeoTimes*. Various staff members did extensive editorial work on manuscripts which had been submitted for publication.

The scientists in charge of the Wellsville Office made 131 well locations, 36 trips to the Northern Gas and Oil Scouts Association meeting, and 85 visits to individuals and companies active in the oil and gas industry in New York State in order to gather data and familiarize them with the activities of the Wellsville office and to exchange information.

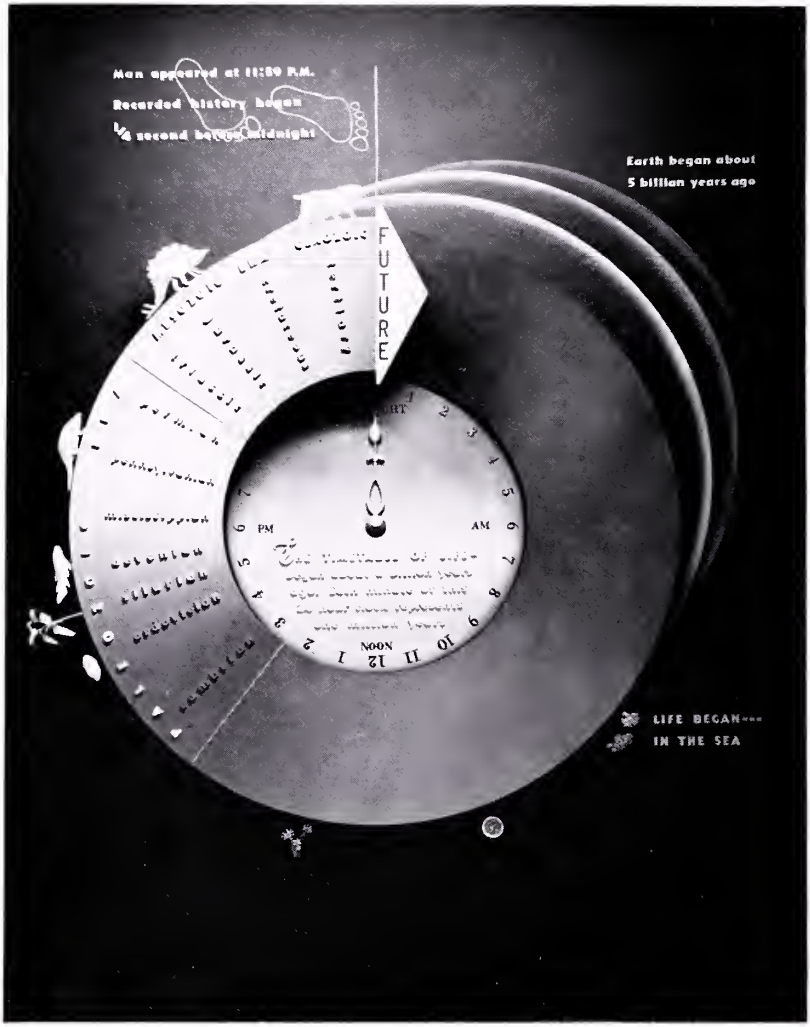
New Projects

The State geologist and associate scientist devoted substantial time during the year to making detailed plans for the new geochemical laboratories. This required visits to manufacturers and other users of similar equipment and the associate scientist attended a school on theory and practice on X-ray spectroscopy sponsored by the North American Phillips Corp. As a result, detailed specifications were set up for the

guidance of the Division of Standards and Purchase in acquiring the new equipment.

The State paleontologist spent about one third of his time planning and conferring with the persons involved in preparing the new exhibits for Paleontology Hall. Information on the results may be found in the Museum section of this report.

Through the cooperation of the State Library, a complete set of the American Society of Testing Material Powder Diffraction data cards was acquired for use with the X-ray equipment. This valuable acquisition will permit making "fingerprint" identifications of all minerals, ores and alloys.



One of a series of new exhibits introducing the visitor to paleontology. Spiraling out of the past we show the parade of life as it appeared on our planet. This billion-year span of life is dramatized in clock form, ticking off a million years each minute.

The Museum

General

All sections of the organization made progress during the year in acquiring better facilities and in providing better service to the public. While there may not be unanimity of opinion on the most outstanding areas of improvement, those that stand out in retrospect are the herbarium, which was provided with much better working conditions, and Paleontology Hall, which saw the unveiling of the first quarter of its new, modernized exhibits.

During the spring and early summer of 1959 approximately 52 tons of botanical materials and their storage cases were moved from the fourth to the fifth floor and reestablished in Biology Hall. An area about 40 by 75 feet was segregated by lining up exhibit cases, providing suitable access doors and arranging the storage cabinets for orderly use. Subsequently, worktables, cabinets and racks were built, and the Department installed telephone, gas, sink with plant washing facilities, fluorescent lighting and numerous electrical outlets. Only a fumigation chamber remains to be acquired. While the area is somewhat noisy when Biology Hall is in use by numbers of schoolchildren (who, although not seen by the botanists, are heard very distinctly!), the new herbarium is a vast improvement on the former crowded, poorly lighted and badly ventilated quarters. The betterment is a forecast of things to come for other curatorial fields during the next year. Then the long-awaited transfer of numerous offices and laboratories to the new wing will release considerable space into which other collections will expand.

Another facility which will help a curator to give better service in less time is an X-ray diffraction unit. The machine was assembled from old and recently acquired equipment and put into operating condition through the knowledge and ingenuity of the curator of geology. It greatly simplifies and expedites the identification of minerals, not only in collection material but in specimens which are submitted by prospectors and other persons who seek information.

Although limited by funds for temporary services, most of the curators were provided with some assistance for increasing and caring for the collections. More progress was made in sorting and cataloging the chaotic mineral collection than for several years past. A number of much appreciated gifts of scientific material were received from donors. Two of these acquisitions which represented a great deal of time and care

Functual form and color directs and introduces the Museum goer to the story of ancient life. Beneath the fluted canopy that terminates this section of the new structure are the displays designed to prepare the viewer for the fascinating story of paleontology that will unroll as the hall is finished.

in preparation were 1,001 mounted vascular plants from Henry F. Dunbar of Kingston and 3,157 plants of various divisions donated by Roy H. Latham of Orient.

Although three displays were lacking, the portion of Paleontology Hall on which the exhibits staff had concentrated their efforts for almost two years was opened for Convocation. The layout, design, color treatment and techniques show imagination, skill and a blending of scientific knowledge with appreciation for modern educational methods. Although natural light, which is admitted through the glass roof, detracts from the desired effect, the work as a whole is impressive. The holding power of the individual exhibits on visitors' attention is noticeable. In marking the near-completion of this quarter-section of the plans for a modernized Hall of Ancient Life, grateful acknowledgment is made of the interest

Something old and something new: A selection of the oldest and finest fossils from the Museum's renowned collection are displayed in this modern alcove as part of the Hall of Ancient Life which is now under construction. The dioramas and specimens depict life in its earliest beginnings.

and encouragement by Department officials. Purchase of some construction materials, including considerable plate glass, was made possible by the allotment of additional funds when the Museum budget was exhausted.

For the work in Paleontology Hall, the regular services of the designer, two preparators, and the carpenter and helper were supplemented by a design assistant (full time after January 1), an artist (about five man-months), two preparator's helpers (for two man-months) and a carpenter (about six months). As a result, the new display wall with view openings was completed, and seven of the eleven displays in the section were finished. The section was opened to public view in mid-May, together with a newly acquired diorama depicting a Carboniferous coal swamp, a Silurian diorama featuring eurypterids and two temporary exhibits on dinosaurs and the horse. At the close of the year, progress

was being made on one of the four displays still to be constructed for the new permanent section and on three exhibits for the area which will be undertaken next year.

Although progress seemed slow, especially to the staff, the rehabilitation of older exhibits in Biology Hall was virtually completed by the end of the year. The project was given its initial impetus by the clearance of space for the herbarium (which in turn was dispossessed of its original quarters by construction of the wing). Except for the loss of the 40-year-old bison and whistling swan groups (the latter in very poor condition), the exhibits suffered little by the construction. On the contrary, their attractiveness and educational value were definitely increased by rearranging and grouping the subject matter, repair or replacement of old specimens, proper labeling, and use of color and light. Wallpaper of appropriate design or other material (such as chicken wiring for the breeds of poultry) was utilized for backgrounds, glass shelving was substituted for the former wood shelves, and fluorescent lights were installed in homemade reflectors for case lighting. The latter enabled us to dispense with the old (and inadequate) overhead lights which festooned the ceiling arches. Floor and lower walls were painted by Department personnel. Finally, the casts of marine animals (porpoises, shark, turtle etc.) were rehabilitated, adapted for suspension by thin wire from the ceiling and were arranged in a naturalistic manner over the largest open space in the hall. It only remains to light them with spot lamps.

Four group displays were exhibited during the year in the small hall at the northwest corner of the Museum. The most pretentious of these shows, on folk art of the Shakers and Iroquois, was the result of a joint effort by the State Museum and the Division of Archives and History. It was planned as a special feature for the annual meeting of the American Folklore Society (which was held in the hall), but was kept on view for about three months. By arrangement with the British Museum (Natural History) we were able to display a group of some 40 striking and artistic photographs made by the photographic staff at that institution primarily to illustrate its scientific publications. Through the courtesy of the Smithsonian Institution, we were able to exhibit a group of bird drawings by Tuttle and later, through a rental arrangement, a photographic show entitled "Anatomy of Nature."

While the total attendance of schoolchildren in organized groups declined slightly from the preceding year, the percentage of those taking advantage of the Museum's docent service for guided tours of the exhibit halls increased from 49 percent in 1958-59 to 60 percent in 1959-60. Beyond doubt, the instruction given these children was improved and

diversified considerably compared with that of the past several years. This enrichment is the result of broad training and experience in nature education which were brought to the program through the appointment of Janet Stone as Museum education supervisor. It is expected that the interest which is being engendered in both teachers and youngsters by lectures, demonstrations, live animals and more interesting museum exhibits will draw a larger attendance and greater demand for service. However, it should be noted that these factors during the past year caused an increase in the average size of the guided groups from 23 children in 1958-59 to 26 in 1959-60. This number, in view of poor acoustics and lack of ventilation in some exhibit halls, is already too large for optimum instruction.

The State Museum continued its efforts to stimulate interest of young people in science by displaying the winning exhibits at Regional Science Fairs and by bringing their creators to Albany for brief visits without personal expense. Those students whose talents were thus recognized in the 1959 Science Fairs were Margery Campbell, then a sophomore at Union Springs Central School, who worked out a salt-crystal exhibit and Nancy Dunning, then a freshman at Ithaca High School, who devised means for making photomicrographs with inexpensive equipment.

Visitation to the exhibit halls was computed, as usual, on the basis of sample counts which were taken on about 23 percent of the open days. Estimated total attendance was 145,000, a decrease of 17 percent from the previous year. A portion of this difference in attendance figures is probably due to better use of the available statistics (resulting from much appreciated advice of the Department's Bureau of Statistical Services). However, it is probable that the actual number of visitors was somewhat less in 1959-60, an abrupt reversal of the steady upward trend of the previous three years. It is possible that increasing congestion of downtown city traffic, with ever-greater pressure on the shrinking parking facilities within easy reach of the Education Building, has discouraged more would-be Museum visitors than in the past. It is also possible that completion of the Berkshire spur of the Thruway, which enables through travelers from the east and southeast to detour around Albany, has played a part in this matter. These, however, are only speculations. This problem and others emphasize the need for a scientific study of our Museum visitors to determine their interests and needs. Definite information is required for better administration and intelligent planning for the future.

Among the numerous visitors who identified themselves to us as having a speeial interest in the State Museum were the following: Mrs. Oliver

(Isabelle Bishop) Dibble of Woodside, Calif., a great-granddaughter of James Hall; E. H. Bryan, retired director of the Bishop Museum in Honolulu; and O. E. Jennings, retired director of the Carnegie Museum, Pittsburgh.

It is a pleasure to report that comparatively little vandalism occurred in the exhibit halls. The only significant damages resulting from deliberate intent were slashes in the upholstered back of a bench in Biology Hall and egg (?) splatters on an Iroquois mask in a special exhibit on folk arts. The bench upholstery was repaired, and the mask was cleaned without detriment.

Except for notices of the opening of temporary displays borrowed from other institutions and information concerning holiday schedules, little attention was paid to the Museum by local newspapers. A feature article by Rosemary Clark on the institution, its history and exhibits was printed in *The Conservationist*. Several radio "shorts" on the Museum and its primary fields of interest were issued by the State Department of Commerce and were widely used by broadcasting stations in New York State. A 12-minute account of the Gilboa fossil forest exhibit was taped by professor Floyd Carlson, of the State University of New York, College of Forestry at Syracuse University, and broadcast on the Empire State FM School of the Air. An illustrated booklet entitled *The Oldest Forest* was prepared by the Museum education supervisor as supplemental information for distribution after the broadcast.

A major disappointment of the year was the rejection of a petition to the National Science Foundation for funds to satisfy the personal assistance and equipment needs of the curators. The petition was submitted before the middle of the period and, as a result of an "inspection" visit by three foundation representatives, was supplemented with additional information. Unfortunately, the request by the State Museum was unable to compete successfully with an unusually large number of demands for the limited money available. This turndown makes it imperative to secure approval for the purchase from State funds, over the next five years, of some $26,000 worth of storage cases, steel shelving and related equipment. Also involved in the unsuccessful petition was a request for an equivalent amount to hire a senior curator (mycologist) and four junior curators. The latter would have served as assistants for the curators to undertake the less exacting phases of the latters' duties. Other major needs of the State Museum are funds for more workers and materials to speed up the exhibits modernization program; adequate ventilation and a new roof for the main exhibit halls (fronting on Washington Avenue) to admit air and to exclude rain and light; and a recep-

tion center, equipment and materials to enable the staff to do a better educational job for visiting schoolchildren and teachers. Lunchroom facilities for school groups would also be of great assistance in the Museum education program.

Curatorial Activities

Archeology

During the year 1959-60 the curator of archeology answered the requests of at least 125 visitors to his office. A few of these inquiries were for bone identification by the State Police, Bureau of Criminal Identification; photographs of ethnological specimens to illustrate two books; information on Iroquois clothing for a mural; illustrations of Iroquois dances; assistance in making photographs for a filmstrip; information on Iroquois artifacts for artwork; and a series of projectile points for professional study. Other requests were answered by mail, including a photograph sent to the Fels Institute at Yellow Springs, Ohio.

Cooperation with the State archeologist continued by assisting his project of defining the projectile point types found in New York. Typical projectile points were provided from the study collections and photographs for the plates were keyed by catalog numbers and data of locality and collector. The curator also assisted a researcher, James Zell, who typed all Onondaga County projectile points in the Otis M. Bigelow Collection and Livingston County points in the F. M. Crofoot Collection. Further assistance was rendered in the rechecking, repackaging and returning of projectile points borrowed from others for this study.

Collections made on the Canandaigua site, the Maxon-Derby site and the Piffard site by the State archeologist were accessioned, cleaned, repaired and cataloged.

Active assistance was given to Mrs. Donna Taylor, a graduate student at Columbia University, in her analysis of wampum belts. The belts were removed from exhibit and storage for her inspection, and all catalog information on them was given to her. Those belts that had not been X-rayed, as well as the invitation wampums from the Beauchamp Collection, were taken by the curator to the State Health Laboratories where such X-rays were made.

The "Esopus Treaty" wampum belt was borrowed from Ulster County for study and repair. A buckskin coat, sash and war bonnet belonging to the Constable Hall Association were borrowed for study and fumigation.

In Morgan Hall, artifacts temporarily stored in units as they came from dismantled exhibits were distributed in the range storage according to county and township.

Several new archeological sites were added to the site record files, and 115 slides were bound and added to the collection. Work on the permanent accession records and catalog card files, which had lagged due to insufficient clerical help, was speeded up.

Botany

The entire collection was moved last year from its former positions to new consolidated quarters at the rear of Biology Hall. This has allowed arrangement of all materials in a linear equating of a phylogenetic sequence. It has also permitted the interpolation of both New York State and out-of-State collections in one sequence. The ranges have been equipped with new fluorescent strip lighting. An alcove, equipped with gas, electricity and running water, has been organized for preparation and mounting of specimens. There is now ample space for sorting, a separate alcove for visitors and room for expansion. The curator was assisted for several weeks in the winter by a temporary employee, Mrs. Frances Carr.

The entire mycological and bryological collections were fumigated during the year.

The nomenclature of the out-of-State collections of mosses was equated with that used in the State collections and the former marked with a distinctive color for easy reference. Duplicate specimens of mosses were separated for distribution to other herbariums. A start was made in placing all out-of-State collections of vascular plants in green folders for easy distinction from the State collections.

Three institutions and nine individuals sent materials in exchange or as gifts. (See p. 44) These accessions are classified as follows:

	FUNGI	ALGAE	BRYOPHYTES	VASCULAR PLANTS	TOTALS
New York State...	1,183	6	1,309	1,832	4,330
Out-of-State	12	0	2	317	331
Total	1,195	6	1,311	2,149	4,661
By Curator					
In-State	417	3	1,434	952	2,806
Total	1,612	9	2,745	3,101	7,467

The most notable accessions were 1,001 mounted specimens of vascular plants from Henry F. Dunbar, collected by him in Ulster County, and 3,157 specimens representing all divisions of botanical subjects donated by Roy H. Latham, Orient, with few exceptions collected by him in Suffolk County.

Activities during the fiscal year resulted in the addition of 22 possible new members to the known fungus flora. Besides this, Anton Slysh, Paul Smith's College of Arts and Sciences, reported eight species of *Peniophora* for the first time from New York. Most of the specimens of bryophytes await determination. A single new record was noted for the vicinity of Oswego and another for the vicinity of Poughkeepsie. Our botanical work, including the transcribing of current reports in the literature, has resulted in the following numbers of additions of species and subspecies to the records of vascular plants for the following counties:

Cattaraugus	1	Greene	10	Saratoga	3
Columbia	5	Herkimer	5	Schoharie	9
Cortland	1	Montgomery	1	Suffolk	6
Delaware	1	Onondaga	2	Ulster	6
Dutchess	16	Rensselaer	5	Warren	1
Essex	9	Rockland	1	Wayne	2
Fulton	10				

Entomology

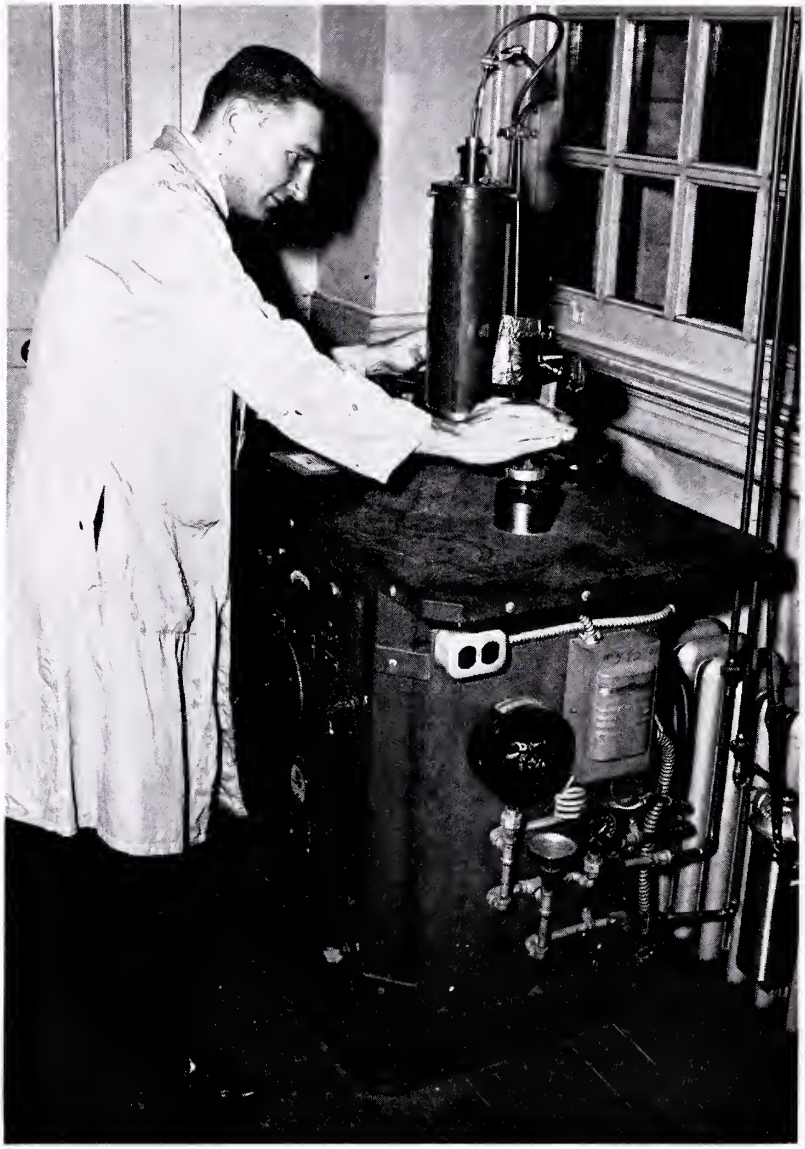
In addition to routine maintenance of the collections, the special project of transferring portions of the collections from cardboard boxes to glass-topped wooden drawers was continued. Moving and rearrangement of most of the duplicate New York State beetles were completed. Similar work was done with a portion of our exotic moths; however, work with this group was curtailed by a lack of storage drawers.

The curator has continued research in the taxonomy of the leaf beetles.

Many insect specimens were collected by the curator and the scientists (entomology) and by William Smith of the Conservation Department. Of these specimens, only a few related to special projects of the entomology office have been mounted and placed in the reference-study collection. Most will be stored dry or in alcohol until an assistant is available to mount and label them.

Approximately 300 requests for information were made to the office of entomology. Most of these inquiries called for the identification of a particular insect and means of controlling it if it were apt to become a pest. Requests were made by telephone, by mail or in person.

Cooperative work with the Forest Pest Bureau, State Conservation Department, included identification of forest insect pests. Considerable effort was made to build up a reference collection of such pests.



Mounting a powder camera on the Museum's X-ray diffraction unit, used to identify minerals

Geology

Acquisition and adaption of new parts and accessories brought into operation for the first time an X-ray diffraction unit. A recordkeeping system was initiated, and storage facilities were developed for irradiated samples and their respective films. Eighty-seven mineral samples were run on the X-ray unit, resulting in the identification of almost as many minerals as otherwise would have remained unidentified. This successfully operating unit, although it is outdated by more modern devices, is a valuable and useful addition to the geological laboratories.

Fourteen hundred and fifty-two specimens from the New York State systematic mineral collection were cataloged. The curator was assisted in this work by three students. As a result, additional data were obtained for the proposed revision of Museum Bulletin No. 70, *A List of New York State Mineral Localities*, which was published in 1903. A conference was held with David Jensen, head of Geological Division, Ward's Natural Science Establishment at Rochester, who will collaborate with the curator in the project.

Seventy-two visitors, many of them schoolchildren requesting samples or information, were assisted during the year. Approximately 280 rock, mineral and ore samples were identified for the public and colleagues. Five hundred sets of New York State rocks and minerals were assembled for sale to students at the information desk. The curator supervised this work, which was accomplished by student help.

On January 7, 1959, the curator assisted junior members of the Capital District Mineral Club in presenting their monthly program. He also accompanied other members during the summer in investigating newly reported mineral localities.

The curator collected 46 mineral specimens from nine localities. Field visits were made to seven major mining operations in the Adirondack region.

Public requests for information totaled 539. The heading indicates the subject about which information was requested; the number which follows is the number of requests received (and answered): rock and mineral specimens and information concerning them, 198; geology of the State, 96; mineralogy (gems and precious stones, locality information etc.), 139; and miscellaneous (caves, books, photos, careers etc.), 106.

Paleontology

Partly because of the continuing program for replacing older exhibits with new displays, a great deal of time was devoted to revising the collection.

Type numbers were changed from the fractional number system to the serial number system on 164 type specimens which had been on exhibit. The contents (306 type specimens and 2,738 nontype specimens) were removed from exhibit cases, and the material was cataloged and stored. Twenty-one new type specimens were added to the type collection, and cards for the same were entered in the catalog. Collections containing approximately 382 specimens were packed for shipment. Ninety-three entries were made in the locality and accession records, and 718 specimens were ticketed with locality numbers. The curator assisted the State paleontologist and senior scientist (paleontology) in extracting material for the new exhibits on brachiopods and coelenterates. As usual, a considerable amount of time was spent in keeping type catalog data up to date. The State paleontologist and senior scientist (paleontology) collected and turned over for accessioning a total of 697 fossil specimens from 28 localities in the State.

Assistance was given to the following visiting scientists who desired to study portions of the collections: Dr. Wilhelm Kegel, Division of Geology, Rio de Janeiro, Brazil (Brazilian fossils); Dr. William A. Oliver, Jr., U.S. Geological Survey (fossil corals); James E. Grierson, Cornell University (fossil plants); William O'Brien, Rensselaer Polytechnic Institute (graptolites); Dr. Michael House, University of Durham, England (fossil cephalopods); William B. N. Berry, University of California, Berkeley (graptolites); Dr. Robert Reidel, Scripps-Howard Oceanographic Laboratory, La Jolla, Calif. (fossil radiolaria); A. L. McAlester, Peabody Museum, Yale University (fossil pelecypods); David Lumsden, University of Buffalo (fossils from Grimsby sandstone); Dr. H. A. Lowenstam, California Institute of Technology (fossils).

Dr. Erik N. Kjellesvig-Waering, Buenos Aires, Argentina, was furnished seven photographs of type eurypterids. Approximately 180 fossil specimens were identified for some 45 visitors, and information on fossils and fossil localities was transmitted to numerous correspondents.

Zoology

The collections were fumigated and given routine care required. In addition, the bird and mammal collections were inventoried, and, where necessary, the specimens were repaired and renumbered and skulls were placed in proper containers.

Bird and mammal specimens were turned over to the Museum by Dr. John Payne, Mrs. Myra Smilow, Mrs. Donald Radke, Mrs. Eleanor Turner, Mrs. B. Shinemann, all of Columbia County; Dan Smiley of

Lake Mohonk; John Belknap of Gouverneur; Marty Hogan of Albany; and several anonymous donors.

Catalog entries now number 19,409, showing an increase of 398 specimens over last year. The majority of these acquisitions are from the small mammal survey. Specimens received from the survey were prepared for storage in cabinets (skulls and skeletons cleaned and numbered) and cataloged. Additional specimens were received, but cleaning and cataloging were not completed in the period reported.

Field trips were made by the curator to the Wilson M. Powell Wildlife Sanctuary at Old Chatham to identify the fauna and faunal niches and to help plan for an educational program using the area in cooperation with biology teachers of nearby schools. Field trips were made, mainly on weekends, with local bird, nature and garden clubs.

Map files on distribution of New York State animals were enlarged. Mapping of bird distribution for the *Handbook of North American Birds* was continued, and earlier maps were revised and otherwise edited.

Letters and phone calls from the public on bird distribution and habits, and on snakes increased over previous years.

Accessions

The collections and, in some instances, exhibits of the State Museum were enriched during 1959-60 by generous donations as follows: (Two items were acquired by purchase.)

Archeology

Specimens from vicinity of Lake Sabago, Maine	Harold M. Ridlon, Naples, Me.
Jasper sample, Vermont	Charles F. Wray, West Rush
Skeleton and charcoal sample	Edward B. Christman, Rensselaer
Specimens from various sites in central New York	Harold Secor, Savannah
Pottery sherds	William Kall, Grindstone Island State Park, Alexandria Bay
Birch bark canoe	Grant Johnson, Ticonderoga
Pottery sherds, St. Lawrence County	Lester Laird, Savannah
Pottery sherds	James Veith, Suffern
"Bust off" from Iverhuron site	Fritz Knechtel, Hanover, Ontario, Can.
Iroquois man's costume (purchased)	Mrs. Adam Spring, Tonawanda Indian Reservation

Botany

Paspalum ciliatifolium from Albany County (10)	Dr. Werner C. Baum, Albany
Vascular plants from Ulster County (1001)	Henry F. Dunbar, Kingston
Plants mostly from New York State (97)	Frederick J. Hermann, Beltsville, Md.
Plants mostly from New York State (3157)	Roy Latham, Orient
Agaricales from the United States (8)	Dr. Josiah L. Lowe, State University of New York College of Forestry at Syracuse University
Phyllosticta aesculi from Albany County (3)	Ralph S. Palmer, New York State Museum
Boletinus glandulosus from Quebec	Dr. René Pomerleau, Sillery, Quebec, Can.
Lactarius chelidonioides from Michigan	Dr. Alexander H. Smith, Ann Arbor, Mich.
Picea glauca from St. Lawrence County	Ralph H. Smith, Delmar
Fungi from New York State (7)	John A. Wilcox, New York State Museum
Plants mostly from New York State (63)	New York Botanical Garden
Vascular plants from St. Lawrence Valley (312)	National Herbarium, Canada

Entomology

Plant galls (71)	Roy Latham, Orient

Geology

"Boxworks"	Martin Tanymann, Carlisle
Gneissic rock slab showing ptymatic folding (one face polished) from Little Hammond	Prof. R. V. Dietrich, Virginia Polytechnic Institute, Blacksburg, Va.
Actinolite from Yonkers	John Kuhorn, Germantown
Graphite in marble from Wilmington Mountain	Kiah Maynard, Wilmington
Triplite (first occurrence in New York State) from Big Moose	Mrs. William Marleau, Big Moose
Brochantite, linarite and barite roses (4)	Richard N. Quint, Albuquerque, N. Mex.
Uraninite, uranophane, allanite, fergusonite, tourmaline, feldspar, zircon, gypsum, apatite, pyrite and biotite from a pegmatite in the southeastern Adirondacks (51)	Elmer Rowley, Glens Falls

Paleontology

Part of fossil tree trunk from Oneonta sandstone, Oneonta, Otsego County	Richard Cower, Oneonta
Thin section slides of our type bryozoa (81)	Dr. Richard S. Boardman, U. S. National Museum
Slabs bearing graptolites from Normanskill beds, Grays Corners, Saratoga County	William Krueger, Jr., Rice University, Houston, Tex.

Donations

Duplicate and other materials which were excess to the needs of the Museum were used to fill requests from schools, cooperating institutions and individuals.

Archeology

Projectile points, duplicate (100)	William Whitaker, Greene
Projectile points, duplicate (4)	Douglas S. Byers, Peabody Foundation, Andover, Mass.

Geology

Suite of igneous rocks from the Adirondacks	Department of Geology, George Washington University, Washington, D.C.
Collection of New York State rocks and minerals	Harry Oborne, Colorado Springs, Colo., for Annual Boy Scout Jamboree
Course-grained graphite from Ticonderoga	U.S. Army Signal Research and Development Laboratory, Fort Monmouth, N.J.

Paleontology

Fossil specimens, duplicate (6)	C. W. Breedlove, Jr., Marietta, S. C.
Rubber casts of trilobites (2)	Dr. Wilhelm Kegel, Divisao de Geologia, Avenida Pasteur 404, Rio de Janeiro, Brazil
Fossil specimens, duplicate (16)	Dr. H. A. Lowenstam, California Institute of Technology, Pasadena, Calif.
Fossil bryozoa, duplicate (2)	Dr. H. Dighton Thomas, British Museum Natural History, London, England
Conularid, *Tentaculites gyracanthus*, duplicate (3)	Dr. Huntington Williams, Baltimore City Health Department, Baltimore, Md.

Exchanges

Botany

Sphagnum (451)	State University of New York College of Agriculture, Ithaca
Sphagnum (161)	New York Botanical Garden, New York
Sphagnum (119)	National Herbarium, Smithsonian Institution
Sphagnum (52)	Prof. William T. Winne, Union College, Schenectady

Loans

On request of schools, government, and other institutions and scientists, materials in the collections were loaned as follows:

Archeology

Indian peace pipe	New York Department of State, Albany
Ethnological pieces: (club, spoon, tanned deerskin, baskets, paddle, bowl, braided corn, arrow points)	Whitney's Department Store, Albany
War club and bows (2)	First Church of Albany
Silver peace medals (2)	Smithsonian Institution, Washington, D. C.
Cranium and mandibles (2)	Menands Public School, Menands
Projection slides (11)	Stanford Gibson (NYSAA), Norwich
Skull	Manufacturers Architectural Representative Service, Albany
Pottery sherds (10)	St. Lawrence University, Canton
Type projectile points (14)	St. Lawrence University, Canton
Ethnological items (21)	Schenectady Museum, Schenectady
Projection slide	National Park Service, Philadelphia, Pa.

Botany

Specimen of fungus and specimens of moss (12)	State University of New York College of Forestry at Syracuse University
Critical specimens of fungi (28)	New York Botanical Garden, Bronx Park, New York 58
Type specimens of fungi (4)	National Fungus Collections, Plant Industry Station, Beltsville, Md.
Type specimens of fungi (10)	University of Chicago, Chicago, Ill.
Type specimen of fungus	University of Michigan, Ann Arbor, Mich.
Type specimens of fungi (3)	University of Tennessee, Knoxville, Tenn.
Type specimen of fungus	Tulane University, New Orleans, La.
Type specimen of fungus	Forest Biology Laboratory, Canadian Department of Agriculture, Maple, Ontario, Can.
Critical specimens of fungi (6)	Forest Biology Laboratory, Canadian Department of Agriculture, Sillery, Quebec, Can.
Type specimens of fungi (8)	University of British Columbia, Vancouver, B. C.
Type specimen of fungus	Rijksherbarium, Leiden, Holland

Entomology

Scientific study collection of bees (*Melissodes*) (56)	Dr. Wallace E. LaBerge, Iowa State College, Ames, Iowa
Vials of aphids (14)	Dr. Mortimer D. Leonard, 2480 16th St. NW, Washington 9, D. C.
Dragonflies (12)	Dr. George W. Byers, University of Kansas, Lawrence, Kans.
Drawer exhibits of insects (3)	West Sand Lake and Miller Hill Elementary Schools, West Sand Lake
Insects (19)	Vincentian Institute, Albany

Geology

Specimens of seybertite, margarite, masonite, corundolite	Department of Geology, University of Wisconsin, Madison, Wis.
A polished limestone concretion	Constanee Walsh, Albany
Collections of New York State rocks and minerals (73)	Schools in New York State

Paleontology

Type specimens of fossil brachiopods (3)	Dr. Thomas W. Amsden, Oklahoma Geological Survey, Norman, Okla.
Fossil specimens (28)	Archbishop Stepinac High School, White Plains
Type specimens of graptolites (3)	Dr. William B. N. Berry, Peabody Museum, Yale University, New Haven, Conn.
Type specimens of graptolites (3)	Dr. William B. N. Berry, University of California, Berkeley, Calif.
Fossil specimens (25)	Beverly Hill School, Huntington Station
Fossil brachiopod specimens (13)	Dr. G. Arthur Cooper, U. S. National Museum, Washington, D. C.
Fossil specimens (25)	Deposit Central School, Deposit
Fossil specimens (25)	East Greenbush Central Schools, East Greenbush
Type specimens of fossil crinoids (10)	Leonard Fernow, Cornell University, Ithaca
Fossil specimens (31)	Mrs. W. M. Garretson, 84 Carthage Rd, Scarsdale
Type specimens of fossil brachiopods (2)	R. E. Grant, U. S. National Museum, Washington, D. C.
Type specimens of fossil cephalopods (26)	Dr. Michael House (of University of Durham, England), Cornell University, Ithaca

Type specimens of fossil ostracods (16)	Dr. Robert V. Kesling, University of Michigan, Ann Arbor, Mich.
Type specimens of eurypterids (3)	Dr. Erik N. Kjellesvig-Waering (of Buenos Aires, Argentina), Chicago Natural History Museum, Chicago, Ill.
Fossil specimens (28)	Manetuck School, West Islip
Type specimens of fossil pelecypods (60)	A. L. McAlester, Peabody Museum, Yale University, New Haven, Conn.
Type specimens of fossil corals (7)	Dr. William A. Oliver, Jr., U. S. Geological Survey, Washington, D. C.
Specimens of nontype fossil corals (44)	
Fossil specimens (25)	Oneida Junior High School, Oneida
Thin section slides of type fossil bryozoa (63)	Dr. T. H. Perry, Indiana University, Bloomington, Ind.
Type specimen of fossil bryozoan	June Phillips-Ross, Peabody Museum, Yale University, New Haven, Conn.
Fossil specimens (27)	Pidgeon Hill Elementary School, Huntington Station
Specimens of fossil brachiopods (15)	John K. Pope, University of Cincinnati, Cincinnati, Ohio
Type specimen of a fossil coral	Dr. Erwin C. Stumm, University of Michigan, Ann Arbor, Mich.
Type specimens of fossil branchiopods (4)	Dr. Paul Tasch, University of Wichita, Wichita, Kans.
Type specimens of trilobites (3)	H. B. Whittington, Museum of Comparative Zoology, Harvard College, Cambridge, Mass.
Fossil specimens (26)	Woodland School, Hazel Crest, Ill.

Zoology

Mammals and birds	Birchwood Elementary School, Colonie
Snakes	University of Florida, Gainesville, Fla.
Birds and mammals	Rensselaer County Junior Museum, Troy
Various animal specimens	Convent of Mercy, Albany
Birds and distribution maps	Cornell University, Ithaca
Birds and mammals	Draper School, Schenectady
Birds	New York State Conservation Department, Albany
Birds	Miller Hill Elementary School, West Sand Lake

Museum Exhibits

Design

With one full-time assistant during the last half of the year, the exhibits designer worked up detailed layouts for approximately 15 major displays for Paleontology Hall. He directed and supervised the carpenters in completing the first quarter of the hall construction, made detailed plans and drawings for the structure and its architectural appearance, and drafted the details for each of the custom-built display cases.

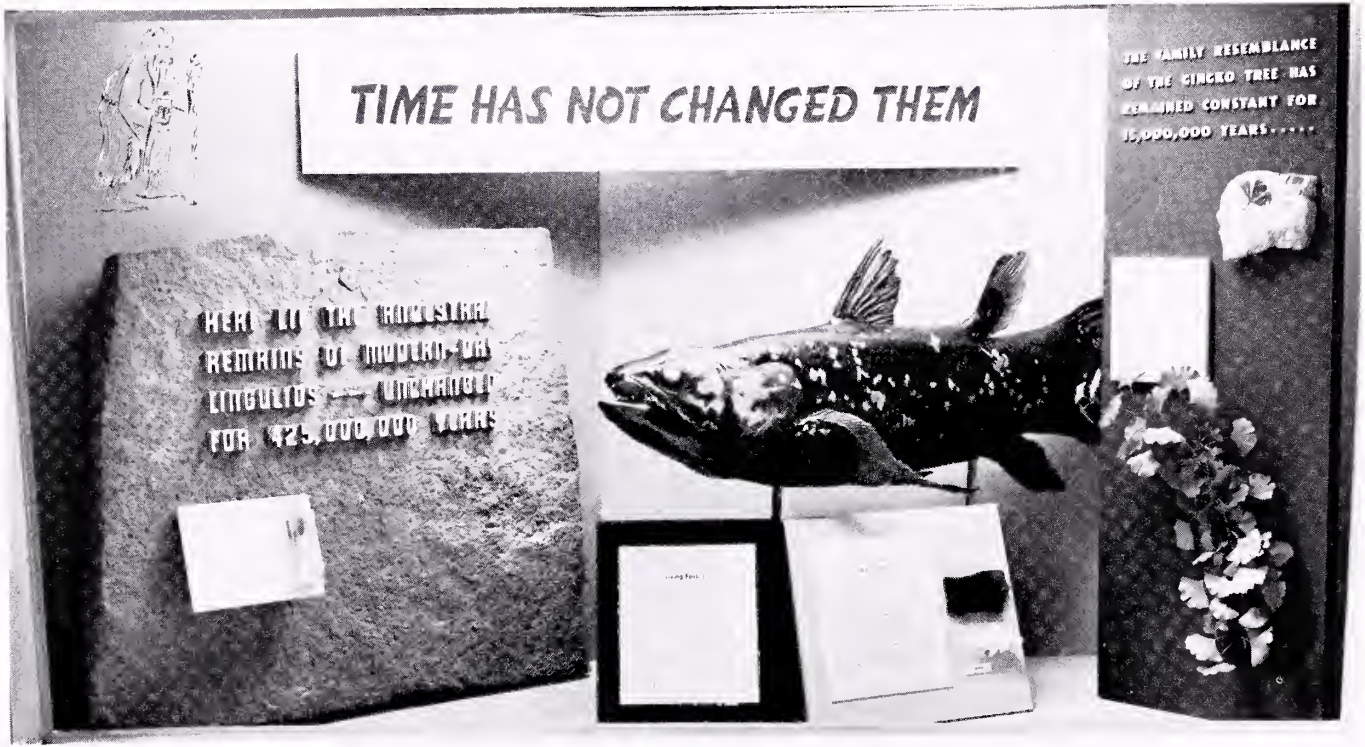
Designs for the following completed or nearly completed displays were made: "How Fossils Are Formed" and "Meet the Paleontologist"; as well as on the geologic timeclock; living fossils; fossil sponges; glass sponges; sponge diorama; Coelenterates; Brachiopods; Cephalopods; Eurypterids; and three dioramas (coal swamp, Eurypterids and armored fish). Advice and directions were given to temporary employees for making exhibits on dinosaurs; the passenger pigeon and bird extinction by Mrs. Edith Froelich; and an exhibit of horse evolution by Louisa Plumb, a student employee.

Among the many other projects undertaken by the designer were: Biology Hall renovation (nearly all the old exhibits and exhibit cases retained for display were redesigned with new interiors), lights and appropriate setting selected for specimens. It involved a general facelifting of the entire hall with a new color scheme and an improved arrangement of traffic flow. The incorporated herbarium included designs for tables, workbenches and color scheme. An arrangement for suspension of five large marine mammals was plotted, and pertaining labels were made and secured nearby. The foyer will receive a new full-scale model of the old Naples Tree for which designs and construction drawings have been made. It will contain a built-in lighting scheme to illuminate the companion fossil slab close behind it. Two new exhibits and cases were designed for a wampum belt display in the Indian groups, and new aluminum railing stock selected for these halls and stairways. Designs were formulated for "free form" tables to be arranged in various combinations in the new conference room. New color schemes and patterns of floor tile were selected for several of the exhibit halls.

Considerable time was spent setting up the "carbon tissue-silk screen" method of labeling. Construction drawings were made for much of the required custom-built equipment.

Preparation

The preparation staff performed the following major items of maintenanee: New York State relief map twice cleaned and repaired; mastodon



Nearly all the early forms of life have succumbed to Father Time, leaving only fossil traces. This newly installed exhibit in Paleontology Hall shows the escapees that have remained relatively unchanged for millions of years.

exhibit twice cleaned and renovated; extensive repairs made on Gilboa Forest exhibit; all mounted birds, mammals and fish not on display reconditioned and stored; zoological storage collections reassembled and stored after herbarium was moved and Biology Hall reorganized; light wells in large mammal groups cleaned and lighting improved; Iroquois food plant exhibit cases repaired; marine fish exhibit renovated and reinstalled; five large plaster casts of marine mammals fitted with hangers, restored, recolored and suspended from ceiling of Biology Hall; 400 mounted birds cleaned, renovated and replaced on exhibit; many new bases constructed and over 50 old ones rebuilt; old bird habitat groupings made smaller and reconstructed for exhibit; large number of mounted mammals cleaned, renovated and provided with new bases; new mammals added to exhibit series and unsuitable old ones replaced; a series of mammal tracks carved in plexiglass and mounted for exhibit; old bison group dismantled and specimens stored; new background painting on glass made for old Devonian cephalopod exhibit; two new wampum belt cases refinished; construction techniques and materials for rebuilding the Naples Tree model worked out and production of new leaf replicas begun.

With the exception of work made necessary by moving the herbarium and reorganizing Biology Hall, the efforts of the preparators were concentrated on the renovation of the Hall of Ancient Life and included the following projects: large glass sponge slab reduced in size and restored as the base of a new sponge pillar exhibit for which specimens and housings were prepared; scale model for coal swamp exhibit prepared and its full-scale counterpart, constructed on outside contract, refurbished and installed; 10 models, ranging from one-cell animals to giant reptiles, created and installed in the geologic timeclock exhibit for which a large "spectrum" was colored and installed; skins and skeletons of four weasels prepared to demonstrate methods of animal preservation; fossil leaf prints and shell reproductions made and installation of fossil formation exhibit completed; living fossil exhibit completed and installed; Upper Devonian and Upper Silurian dioramas completed and installed; five enlarged models of cephalopods made and colored; coelenterate exhibit prepared and installed; horse skull prepared for renovated exhibit on horse evolution and scale models of eohippus reproduced to replace stolen one; old dinosaur exhibit renovated and provided with new labels; replicas of fossil fish model made for paleontology section; complete caribou skin and skeleton prepared for research collection.

For the archeology section, the main projects included: two Indian pipes reproduced; work done on a relief map; large clay vessel repro-

duced and colored; broken stone artifacts repaired; drawings of arrowheads made; plaster letters made and colored; illustrated labels made for Iroquois groups; and various items of field equipment repaired. Assistance was provided in installing the Shaker-Indian exhibit, and material was prepared for an archeology meeting.

In February the exhibits designer and the senior technician spoke before the Museum staff on preparation of exhibits for the new Hall of Ancient Life. A similar talk was given when Education Department members previewed the exhibits thus far completed for the new hall.

The Public

Sample counts of visitors to the exhibit halls were made on 72 of the 325 days during which the Museum was open. Estimated attendance during 252 weekdays, based on the sample taken on 42 counting days, was 114,000. Estimated attendance during 51 Saturdays, based on an eight-day sample, was 20,350. Actual attendance on the 14 Sundays during the summer when the Museum was open was 5,124. Actual attendance on eight holidays was 5,221. Total attendance for the year was approximately 145,000, a drop of 17 percent when compared with the estimate for last year of 175,000.

Highest daily count (1,500) occurred on Saturday, March 12, the day of the St. Patrick's Day parade. Highest count on a normal weekday was 788 (Tuesday, July 7). Lowest count recorded was 188 (Tuesday, December 22). Daily average, including weekdays, Saturdays, Sundays and holidays, was 466.

The Department nurse was called to attend a total of 20 visitors who required some medical assistance. Seventeen of these cases were schoolchildren who fainted or became ill in the Indian groups. This part of the Museum continues to be poorly ventilated despite the use of two fans. There were three minor accidents and one serious accident when, on Saturday, September 19, 1959, an elderly woman fell down the stairs from the Indian groups to Geology Hall and complained of back and hip injuries. No medical assistance was available, but the guards made her comfortable until she was taken to the hospital by ambulance.

The Museum guards have continued to carry out their duties faithfully and efficiently and have performed numerous helpful services. Exhibit cases have been painted and glass washed. All lighted exhibit cases are checked daily and rebulbed as often as necessary. Guards assisted Museum staff members with installation of new exhibits and the renovation of old exhibits. They also aided the carpenters in dismantling and moving

cases and other material from the Museum. It is necessary to cover the cases in Geology Hall and the new construction in Paleontology Hall with large sheets of plastic whenever it rains. Something should be done to alleviate this problem because, should it rain while the Museum is closed and no guards are on duty, extensive water damage could occur. The guards helped with the equipment used by staff members of New York State College of Education in preparing a film to be shown in classrooms of public schools.

Learning animal characteristics from living specimens is a new phase of the instruction provided by the Museum.

Special Services

Museum Education Program

THE MUSEUM EDUCATION OFFICE provided instruction for the teachers, youth leaders, school classes and other groups that visited the Museum during the year. The staff continued to adapt its teaching to the particular needs of these groups by giving subject matter lesson tours to augment classwork and by giving introductory talks. Natural history tours are now enlivened by live animals.

The filling of vacancies on the staff made it possible for the education office to give guided tours to a larger proportion of the total number of groups which visited during the year. The position of Museum education supervisor was filled in October by Janet L. Stone and that of part-time instructor by Mary Jane Stauch. Additional instruction of a more specialized nature was provided at the Museum and in the field by Museum curators and scientists.

Efforts by the staff to conduct guided tours of maximum effectiveness continued to be balked by the poor acoustics of the exhibit halls. Other factors which also reduce the effectiveness of the Museum education program are overcrowding during the spring months, lack of a suitable reception center for groups and lack of lunchroom facilities.

Instruction for Visiting Groups

Brief introductory talks and longer guided tours on Indians, animals, rocks and minerals, fossils, birds and other subjects were given to groups ranging in age from preschool through adult.

Total attendance by groups was 28,936, a slight drop (2.5 percent) from the year before. Of this total, 60 percent (17,406) received guided tours as compared with only 49 percent the year before. This desirable increase was somewhat offset, however, by a rise in the average number of students per tour from 23 last year to 26 this year.

Of those who visited in groups, 84 percent were school students. The remaining 16 percent came as members of Scouts, PTA, church and other organizations. The following tables show school and nonschool distribution by grade (or age level) and by service.

School Groups

GRADES	TOTAL ATTENDANCE	TOURS		INTRODUCTORY TALKS	
		NUMBER	ATTENDANCE	NUMBER	ATTENDANCE
Nursery school	18	1	18	—	—
K, 1-3	3,923	135	2,639	1	25
4-6	9,389	308	7,680	2	77
7-9	8,426	145	4,337	6	417
10-12	1,588	20	590	1	154
Multigraded	644	8	515	—	—
College	403	4	63	—	—
Adult education	53	3	53	—	—
Totals	24,444	624	15,895	10	673

Nonschool Groups

AGE LEVEL	NUMBER OF GROUPS	TOTAL ATTENDANCE	TOURS		INTRODUCTORY TALKS	
			NUMBER	ATTENDANCE	NUMBER	ATTENDANCE
Youth	154	4,420	36	1,072	—	—
Adult	30	743	5	171	15	260
Totals	184	5,163	41	1,243	15	260

Instruction was provided by the Museum education staff and by curators and scientists as follows:

STAFF MEMBER	NUMBER OF TOURS	NUMBER OF INTRODUCTORY TALKS
Drumm	293	15
Stauch	130	2
Stone	227	8
Fenton	1	—
Fisher	3	—
Gillette	1	—
Koster	2	—
Reilly	10	—
Ritchie	1	—
Smith	1	—
Totals	672	25

Data on 620 visiting groups show that 67 percent of these groups came from within a 50-mile radius of Albany; 29 percent from a distance of 50 to 150 miles; 3 percent over 150 miles; and 1 percent from out of the State.

Museum Education Extension Program

Several members of the staff traveled outside of the Museum building to conduct educational programs for various groups. Examples of some of the programs presented are outlined below. (See also Appendix C.)

The Museum education supervisor addressed the annual winter conference of the Science Teachers Association of New York State, on "How the State Museum Can Serve High School Classes." She also was a resource panel member for a science forum on "School Use of Wildlife Sanctuaries," sponsored by the Tivoli Lake Nature Sanctuary.

The curator of geology presented a talk on career opportunities in geology to students at Philip Livingston Junior High School, Albany.

The curator of entomology spoke to the combined biology classes of the College of St. Rose on how teachers can use insect collecting as a teaching aid.

The curator of zoology presented special lectures on birds and mammals to the Caduceus Garden Club of Schenectady, the Castleton Garden Club, Altamont Elementary School, Cohoes Elementary School, the New Hampshire Teachers Association, the Conservation Assembly of the Berkshires and the Roundtable of Naturalists and Scientists. The curator acted as judge in the annual eastern New York Science Fair and talked on museum matters to the Science Teachers Association of New York at their annual meeting. Field trips for schoolchildren were led to Wilson M. Powell Sanctuary on six occasions, and scout groups were given lectures and demonstrations about animal life and survival in the wilds.

Related Activities

Conferences and Meetings

The Museum education supervisor toured the following museums to observe their educational program: the American Museum of Natural History, the Brooklyn Children's Museum, the Buffalo Museum of Science, the Rochester Museum of Arts and Sciences, and the Royal Ontario Museum, Toronto. The supervisor and the instructor attended the annual conferences of the American Association of Museums in Boston and the Northeast Museums Conference in Buffalo.

Publications

Two articles were prepared for the *Bulletin to the Schools* to assist teachers in planning a class visit to the State Museum and to encourage students to use the Museum during the summer. *The Oldest Forest*, a booklet for intermediate and high school students was prepared to be distributed in conjunction with an educational television program produced

by Dr. Floyd Carlson of the State University of New York College of Forestry at Syracuse University.

Museum Sales Desk

The volume of sales at the sales desk increased from $600 for 1958-59 to $3,258.25 for 1959-60. A number of educational items have been added to the inventory, such as a rock and mineral set (see report of curator of geology), nature games, field guides and additional books for children.

The sales list for these items was:

1,148	Pamphlets and books
812	Rock, mineral and gem stone sets
388	Activity kits
52	Nature games
319	Cards and letter paper
2,697	Dinosaur models
284	Arrowheads
12	Record albums of bird songs
10	Hummingbird feeders

There is a demand on the part of teachers and the general public for a greater number of titles in natural history and physical science as well as for inexpensive educational items for children. A saleswoman-receptionist would enable us to serve the public more effectively.

Museum Library

During the past year the master file of addresses to which Museum publications will be sent for review or to which notification of publications will be sent was completed. This entire list, numbering 321 institutions, journals etc., has been coded for facility in use. The periodical routing lists for the State Library and the Museum library were revised.

The total number of items accessioned during the year was 3,412. This is a slight decrease over the preceding year when 3,580 items were accessioned.

The following honorarium reports were received: *Geology of the Magnetite Deposits and Associated Gneisses near Ausable Forks, N.Y.*, by Lorence G. Collins; *Quantitative Mineralogy as a Guide to Prospecting in Metamorphic Regions*, by Lorence G. Collins and A. F. Hagner; *Progress Report on a Study of the Development of Vocalization in the Eastern Bluebird (Sialia sialis)*, by James M. Hartshorne; *Preliminary Report and Geology Map of the Cornwall, N.Y., Quadrangle*, by K. R.

Kothe; *Stratigraphy and Paleontology of the Salina Group in Central New York*, by Willard P. Leutze; *Geology of the Cooperstown, N.Y., Quadrangle*, by Donald H. Zenger.

Correspondence increased this year. Several letters of inquiry were received from librarians of other State geological surveys and/or departments.

Crowded periodical files were cleaned out, and, if necessary, serials of limited interest were taken to the New York State Library, gifts and exchange section. Numerous duplicates were also transferred to that office. Such transfers totaled 776 items. Problems arising through exchanges were solved with assistance of the gifts and exchange section. Changes in the Museum library exchange file were maintained currently.

Photography

A total of 136 separate requests for services resulted in the following: 567 black and white photographs taken; 1,312 negatives processed from field photographs, and 2,467 prints and enlargements made from the preceding. In addition, 101 projection slides were prepared, and 167 color photographs were taken.

This work included both field and office assignments: several sets of slides to be used in talks at archeological society meetings; color photographs of archeological material to illustrate a book; records of the summer archeological field projects; pollen studies; control of punkies and projects concerned with forest insects; reproduction of charts and maps for *Handbook of North American Birds;* enlargements and reductions of topographic maps for the State Geologic Map; illustrations for a treatise on invertebrate paleontology and photographs of type specimens for use of foreign scientists. For the exhibits preparation staff, photographic records were made showing progress and completion of exhibits, and advice was given on methods of preparing labels.

Science Fair students were photographed with their prize-winning exhibits.

Requests for photographic services by the Department included: Ninetieth Convocation Ceremonies; meeting of the State Boards of Education of the Northeastern States and meeting of State Commissioners of Education; dedication of the annex to Education Building; merit award ceremonies and service awards and retirements.

Publications

NINE MUSEUM BULLETINS (including an annual report) and three miscellaneous items were printed during the year. These publications totaled 958 pages of text and 141 plates, figures, maps, tables and graphs. Two of the miscellaneous items, comprising 64 pages and two figures, were multilithed. The third, a large plate showing the correlation of Silurian rocks in the State and issued as the first number in a new Map and Chart Series, was printed by offset.

The number of items published in 1959-60 was double that issued during the previous year, and the total number of text pages increased almost as much (958 in 1959-60 as compared with 438 in 1958-59). Two manuscripts that were completed before the end of the year were held over due to lack of editorial assistance in the Department's Bureau of Publications to prepare them for the printer.

At the end of the year, in addition to the two items "in press" for publication by the State Museum, four manuscripts had been completed for other institutions; they will probably appear before June 30, 1961. The status of manuscripts in process of writing by staff scientists and curators in the various disciplines was as follows:

	To be ready for printing	
	Before June 30, 1961	After June 30, 1961
Archeology	3	1
Botany	3	
Entomology	5	1
Geology—Paleontology	6	8
Zoology	1	1

Publications

State Museum and Science Service

1960 121st Annual Report of the New York State Museum and Science Service, July 1, 1958 - June 30, 1959. N. Y. State Mus. & Sci. Serv. Bull. No. 381. Jan. 1960. 64pp. 8 pl.

Cox, D. D.

1959 Some postglacial forests in central and eastern New York State as determined by the method of pollen analysis. N. Y. State Mus. & Sci. Serv. Bull. No. 377. 52pp. 14 fig. 1 map

Drumm, J. A.

1959 Planning the State Museum visit. Bull. to the Schools, v. 46, No. 2, pp. 73-77. Oct. 1959

Fisher, D. W.

1960 Correlation of the Silurian rocks of New York State. N. Y. State Mus. & Sci. Serv. Map and Chart Series No. 1

Jamnback, H. & Wall, W.

1959 The common salt marsh Tabanidae of Long Island, N. Y. N. Y. State Mus. & Sci. Serv. Bull. No. 375. 77pp. 27 fig.

Kilfoyle, C. F.

1959 Catalog of type specimens of fossils in the New York State Museum, Supplement 5. N. Y. State Mus. & Sci. Serv. Bull. No. 376. 134pp.

Kreidler, W. L.

1959 Selected deep wells and areas of gas production in eastern and central New York. N. Y. State Mus. & Sci. Serv. Bull. No. 373. 243pp. 4 maps. 5 tab.

Ogden, E. C. & Lewis, D. M.

1960 Airborne pollen and fungus spores of New York State. N. Y. State Mus. & Sci. Serv. Bull. No. 378. 104pp. 74 gphs.

Ritchie, W. A. & Dragoo, D. W.

1960 The eastern dispersal of Adena. N. Y. State Mus. & Sci. Serv. Bull. No. 379. 80pp. 2 fig. 5 tab. 16 pl.

Stone, J. L.

1960 The oldest forest. (Gilboa Forest). N. Y. State Mus. & Sci. Serv. Multilithed. 10pp.

1960 Hall of Ancient Life revamped. Bull. to the Schools, v. 46, No. 10. pp. 346-347

Sutton, R. G.

1960 Stratigraphy of the Naples group (Late Devonian) in western New York. N. Y. State Mus. & Sci. Serv. Bull. No. 380. 56pp. 15 fig. 1 tab. 1 map

1960 Structural geology of the Dryden and Harford quadrangles, New York. N. Y. State Mus. & Sci. Serv. 15pp. 2 fig.

Wiggins, J. W.

1959 Sample study and correlation of E. C. Kesselring No. 1 Well. N. Y. State Mus. & Sci. Serv. 48pp.

In "Outside" Media

Cahalane, V. H.

1959 A biological survey of Katmai National Monument, Smithsonian Miscellaneous Coll. v. 138, No. 5 (August) Washington, D. C.

1959 A giant bear. The New Scientist. v. 6, No. 161. (December). pp. 1242-1244. illus.

1959 The first four years. Cranbrook Institute of Science, Bloomfield Hills, Mich. Bull. 37, pp. 110-112

Collins, D. L.

1960 Status of eastern equine encephalitis and the mosquito vector potential in New York State. N. Y. State Jour. of Medicine. v. 60, No. 8. (April)

Connola, D. P., Waters, W. E. & Nason, E. R.

1959 A sequential sampling plan for red-pine sawfly *Neodyirion nanulus*. Jour. Econ. Ent. v. 52, No. 4. (August)

1960 Airplane spray tests for the control of gypsy moth. Station to Station Research News. Union Carbide Chemicals Company, White Plains. v. VI, No. 3. (March)

Connor, P. F.

1960 A study of small mammals, birds and other wildlife in an area sprayed with Sevin. N. Y. State Fish and Game Jour. (June)

Fenton, W. N.

1959 John Reed Swanton (1873-1958). American Anthropologist, v. 61, No. 4, pp. 663-668

1959-60 Articles: James Mooney, Clark Wissler, Delaware, Mahican-Mohegan, Mohawk, Oneida, Onondaga, Cayuga, Seneca and Iroquois (League of). Encyclopaedia Britannica (revised edition)

1960 The Hiawatha wampum belt of the Iroquois League for peace—selected papers of the Fifth International Congress of Anthropological and Ethnological Sciences, Philadelphia, Pa. 1956. Univ. of Pennsylvania Press, Philadelphia. pp. 3-7

1960 Review: L. H. Morgan's The Indian Journals, 1859-62. Science, v. 131, p. 402

Kreidler, W. L.

1960 Gas and oil developments in New York State in 1959. American Association of Petroleum Geologists. v. 44, No. 6. (June)

1960 A preliminary report on underground storage of natural gas in New York State. Interstate Oil Compact Commission

Ogden, E. C.

1960 Tagging and sampling ragweed pollen. Progress Report No. 1. U.S.P.H.S. Research Grant E 1956. Mimeographed. (May)

Reilly, E. M.

1959-60 Articles: Bird and 22 individual birds. Encyclopedia Britannica Junior (revised edition)

Ritchie, W. A.

1959 Excavation of an Owasco village site in New York: report on 1958 settlement pattern studies in the Northeast. Eastern States Archeological Federation, Trenton, N. J. Bull. 18, pp. 11-12

Ritchie, W. A. & Dragoo, D. W.

1959 The eastern dispersal of Adena. American Antiquity, Salt Lake City, Utah. v. 25, No. 1, pp. 43-50

Slysh, A. R.

1959 The genus *Peniophora* in New York State and adjacent regions. State University of New York College of Forestry at Syracuse University. Teeh. Publ. 83, pp. 1-95, illus.

Van Tyne, A. M.

1959 Report on oil and gas aetivities for 1959 in New York State. Amcrican Institute of Mining, Metallurgical and Petroleum Engineers

Wilcox, J. A.

1960 Some beetles of New York. N. Y. State Conservationist, v. 14, No. 4. (Feb.-Mar.) pp. 23-27

Appendix A

1960 Graduate Student Honoraria Recipients

Archeology

JACOBSEN, JEROME—Columbia University
Study of Ward's Point area in Tottenville, Staten Island, of aboriginal shell midden and "Burial Ridge" ..... $ 504

TAYLOR, DONNA—Columbia University
Iroquois wampum study 360

Botany

BRODO, IRWIN M.—Michigan State University
Study of distribution and ecology of the lichens of Long Island 492

Entomology

DI CYAN, ERIKA—Syracuse University
Study of the ablation of the corpora cardiaca of the cockroach 360

Geology

CONNALLY, G. GORDON—Michigan State University
Reconnaissance map of the glacial drift south of the Valley Heads Moraine 408

DODD, ROBERT T.—Princeton University
Mapping of the Popolopen Lake quadrangle 504

SIMMONS, M. G.—Harvard University
Complete gravity survey over Adirondack area 600

SOUTHARD, JOHN B.—Massachusetts Institute of Technology
Stratigraphic relations of rocks of Lower Devonian Age in northern part of Paleozoic outlier 300

ZENGER, DONALD H.—Cornell University
Stratigraphic and paleontologic study of Middle Silurian Lockport formation 480

Zoology

BUCKLEY, PAUL A.—Cornell University
Study of birds along the coast of Long Island 180

CARLSON, BRUCE M.—Cornell University
Chromatographic study of amino acids in various species of larval lampreys 504

$4,692

Appendix B

Conferences and Professional Meetings in which the Museum and Science Service Staff participated:

Administrators of Museums in New York State, organization meeting, New York—Cahalane, Fenton

American Academy of Allergy, 16th Annual Meeting, Hollywood, Fla.—Ogden

American Association of Museums, annual meeting, Boston, Mass.—Cahalane, Fenton,* Stone, Drumm

American Association of State Geologists, annual meeting, Harrisburg, Pa.—Broughton, Fisher

American Committee for International Wildlife Protection, annual meeting, New York—Cahalane

American Ethnological Society, annual meeting, New York—Fenton

American Folklore Soceity, Albany—Fenton, Gillette

American Folklore Society, joint meeting, Bloomington, Ind.—Fenton

American Indian Ethnohistoric Conference, New York—Fenton

American Institute of Mining Engineers, annual meeting, New York—Broughton

American Institute of Mining Engineers, regional meeting, Bedford Springs, Pa.—Broughton

American Institute of Mining, Metallurgical and Petroleum Engineers, North Creek—Borst

American Mosquito Control Association and Northeastern Mosquito Control Association, joint annual meeting, Boston, Mass.—Jamnback, Collins

American Ornithologist's Union, annual meeting, Regina, Saskatchewan—Palmer

Bureau of Forest Pest Control, annual meeting, Saratoga—Collins, Connola

Carnegie Museum, Ligonier Valley, Pa.—Ritchie

Conference on Arthropod-Borne Encephalitis in New York, Albany—Collins, Jamnback

Conference of Directors of Systematic Collections (Research Museums), Albany—Cahalane, Collins, Fenton; Cambridge, Mass.—Cahalane, Fenton; Lawrence, Kans.—Fenton

Conference on Gypsy Moth Research Problems, New Haven, Conn.—Campbell, Collins, Connola

Conference on Lake Bottom Sampling for Fossil Pollen and Related Subjects, Syracuse—Collins, Ogden, Lewis

Conference with Canadian Health Department on Arthropod-Borne Animal Diseases in St. Lawrence Valley, Wells Island—Collins

Conference on Vector Hazards of St. Lawrence Seeway, Syracuse—Collins

Conference on Status of Bedrock Mapping, Middletown, Conn.—Isachsen

Conference National Science Foundation, Washington, D.C.—Isachsen

Conference U.S. Geological Survey, Washington, D.C.—Isachsen

David Boyle Lecture, University of Toronto, Toronto—Ritchie

Dedication-Osborn Ornithological Laboratory, Peabody Museum, Yale University—Cahalane, Fenton, Palmer, Reilly

Defenders of Wildlife, annual meeting, Washington, D.C.—Cahalane

Eastern States Archeological Federation, annual meeting, Albany—Gillette, Ritchie

Engineers Society of Western Pennsylvania, Bradford, Pa.—Van Tyne

Entomological Society of America, annual meeting, Detroit, Mich.—Jamnback

Entomological Society of America, Eastern Branch, annual meeting, Baltimore, Md.—Connola, Collins

Federation of New York State Bird Clubs, Buffalo—Reilly

Geological Society of America, Pittsburgh, Pa.—Borst, Broughton, Fisher, Isachsen, Rickard

* Read formal paper.

Interstate Oil Compact Committee Meeting, Philadelphia, Pa.—Kreidler
Meeting of State and University Scientists, Syracuse University, Syracuse—Ritchie
Mohawk-Caughnawaga Museum, annual meeting, Fonda—Gillette
New Jersey Archeological Society, Trenton, N. J.—Ritchie
New York Academy of Sciences on Geochronology, New York—Isachsen
New York State Archeological Association, Rhinebeck—Gillette, Richie
New York State Archeological Association, Van-Epps Hartley Chapter, Schenectady—Gillette*; Albany—Fenton, Gillette, Ritchie*
New York State Geological Field Conference, Clinton—Borst, Broughton, Fisher, Isachsen, Kreidler, Rickard, Van Tyne
New York State Museum Association for Western New York, Rochester—Fenton
New York Section, Society of American Foresters, Albany—Connola
Ninth International Botanical Congress, Montreal, Can.—Ogden, Lewis
Northeast Museums Conference, Buffalo—Cahalane, Drumm, Gillette, Stone
Northeastern Bird-Banding Association, South Lincoln, Mass.—Palmer
Northeastern Forest Pest Council, Boston, Mass.—Connola
Paleontological Research Institute, semiannual meetings, Ithaca—Rickard
Society for American Archeology, New Haven, Conn.—Gillette, Ritchie
Twelfth Conference on Iroquois Research, Red House—Fenton,* Gillette, Ritchie*
Well Stimulation and Cementing Techniques Seminar, Lewis Run, Pa.—Van Tyne

Appendix C

Cooperative Work (Service): Talks given by the staff of State Museum and Science Service to various groups:

Adirondack Mountain Club, Albany Chapter—Cahalane
Albany Club of Sigma Xi—Fisher
Archeological and Historical Society, Schoharie—Ritchie
Auringer—Seelye Chapter, New York State Archeological Association—Fenton
Bethlehem School District Librarians—Fenton
Blue Mountain Lake Association—Jamnback
Caduceus Garden Club, Schenectady—Reilly
Canadian Broadcasting Company, Toronto—Fenton
Capital District Geologist Club—Isachsen
Capital District Mineral Club—Borst
Cardinal McClosky High School—Cahalane
Castleton Garden Club—Reilly
Cohoes Elementary School—Reilly
College of St. Rose, combined biology classes—Wilcox
Columbia County Extension Service, Claverack—Fisher
Conservation Assembly of the Berkshires—Reilly
Dana Natural History Society—Fisher
Dartmouth College, American literature class—Fenton
Daughters of the American Revolution, Hudson Chapter—Fenton
Eastern New York Science Fair, Judge—Reilly
Harrietstown Town Board—Jamnback
Isaac Walton League—Fenton

* Read formal paper.

Kiwanis Club, Rensselaer—Fenton
Newburgh Public School, adult education—Isachsen
New Hampshire Teachers Association—Reilly
Philip Livingston Junior High School, career guidance—Borst
Rotary Club, Niskayuna—Fenton
Rotary Club, Pawling—Cahalane
Roundtable of Naturalists and Scientists—Reilly
Sanitarians of New York City and Vicinity Health Department, New York—Jamnback
Schenectady County Historical Society—Fenton
Schoharie Public Schools—Rickard
Schroon Lake Town Board—Jamnback
Science Teachers' Association of New York State—Reilly, Stone
Scout Groups—Reilly
State Conference of Supervisors of Citizenship Education—Fenton
Tupper Lake Fish and Game Club—Jamnback
Tupper Lake Town Board—Jamnback
Vassar College Anthropology Club—Fenton
Wilson M. Powell Sanctuary, field trips for schoolchildren (6)—Reilly
WPIX—Educational Television—Fenton

Appendix D: Cooperating Agencies

A continuing function of the Museum and Science Service is to cooperate with agencies and organizations concerned with museum and research activities in this and other States, with the governments of United States and Canada, with universities and industry in the discovery, analysis and dissemination of scientific information. These contacts are frequently of reciprocal services, and they arise often out of the personal contacts of the staff and, if so listed, would measure individual participation, but they are here tabulated for the organization.

Albany Medical Center Hospital
American Civil Liberties Union, Indian Civil Rights Committee
American Indian Museum
Buffalo Museum of Science
Forest Biology Laboratory, Canadian Department of Agriculture
Forest Disease Survey, Forest Biology Laboratory, Canadian Department of Agriculture
Harvard University: Gray Herbarium, Museum of Comparative Zoology, Peabody Museum
Memorial Hospital, Albany
National Art Museum of Sport
National Fungus Collections, Plant Industry Station, Beltsville, Md.
National Science Foundation
New York Botanical Garden
New York State Department of Agriculture and Markets
New York State Department of Commerce
New York State Department of Conservation

New York State Department of Public Works
New York State Police, Bureau of Criminal Investigation
New York State Supreme Court
New York State Teachers Association, Annual Winter Conference
State University of New York, College of Agriculture at Cornell University
State University of New York, College of Forestry at Syracuse University
State University of New York, Harpur College at Endicott
Paleontological Research Institution
Rensselaer Polytechnic Institute
Rijksherbarium, Leiden, Holland
Schenectady Museum
Science Teachers Association of New York State, Inc.
St. Peter's Hospital, Albany
Smithsonian Institution, Washington—Bureau of American Ethnology, U.S. National Museum
Syracuse University
Tulane University
University of British Columbia
University of Chicago
University of Michigan
University of Tennessee
Wellsville Daily Reporter
Yale University and Peabody Museum

Appendix E: Professional Affiliations

Adirondack Mountain Club, Albany Chapter, vice chairman—Cahalane (reelected)
Albany Club of the Society of the Sigma XI, secretary—Fisher
American Committee for International Wildlife Protections, vice chairman—Cahalane (reelected)
American Folklore Society, president—Fenton (reelected)
American Mosquito Control Association, editor—Collins
American Ornithologist's Union, editor of *Handbook of North American Birds*—Palmer
Defenders of Wildlife, vice president—Cahalane
Entomological Society of America, Eastern Branch, program chairman—Collins
Entomological Society of America, member of Culicoides Panel—Jamnback
Federation of New York State Bird Clubs, Publications Committee—Reilly
Industrial Minerals Division of AIME, chairman—Broughton
National Parks Association, president—Cahalane
New York State Archeological Association, treasurer—Gillette
New York State Archeological Association, Van-Epps Hartley Chapter, trustee—Gillette
Northeastern Forest Pest Council—Collins, Connola
Northeastern Forest Tree Improvement Committee, member for New York State—Collins
Northeastern Mosquito Control Association, president—Jamnback
Society of American Foresters, New York Section, member of Committee on Forest Insects and Diseases—Connola
Society of Mining Engineers, AIME, director—Broughton