# New York State Museum Bulletin

Published by The University of the State of New York

No. 288 ALBANY, N. Y. July 1931

NEW YORK STATE MUSEUM

CHARLES C. ADAMS, *Director*

# TWENTY-FOURTH REPORT OF THE DIRECTOR OF THE DIVISION OF SCIENCE AND THE STATE MUSEUM

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ALBANY
THE UNIVERSITY OF THE STATE OF NEW YORK
1931

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# THE UNIVERSITY OF THE STATE OF NEW YORK

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1943 THOMAS J. MANGAN M.A., LL.D. - - - - - Binghamton
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1936 JOHN LORD O'BRIAN B.A., LL.B., LL.D. - - Buffalo
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Teacher Training, HERMAN J. MAGEE M.A., Ph.D.
Visual Instruction, ALFRED W. ABRAMS Ph.B.

*New York State Education Department*
*The State Museum, February 19, 1930*

*The Honorable Frank P. Graves*
*President of the University and*
*Commissioner of Education*

SIR: I beg to submit herewith the report of the Director of the State Museum for the period from July 1, 1928, to June 30, 1929.

Very respectfully

CHARLES C. ADAMS
*Director*

## THE LEGAL STATUS OF THE NEW YORK STATE MUSEUM

[New York State Education Law]

§ 53 **Departments and their government.** The state library and state museum shall be departments of the university, and the regents may establish such other departments and divisions therein as they shall deem useful in the discharge of their duties.

§ 54 **State museum; how constituted.** All scientific specimens and collections, works of art, objects of historic interest and similar property appropriate to a general museum, if owned by the state and not placed in other custody by a specific law, shall constitute the state museum, and one of its officers shall annually inspect all such property not kept in the state museum rooms, and the annual report of the museum to the legislature shall include summaries of such property, with its location, and any needed recommendations as to its safety or usefulness. The state museum shall include the work of the state geologist and paleontologist, the state botanist and the state entomologist, who, with their assistants, shall be included in the scientific staff of the state museum.

§ 55 **Collections made by the staff.** Any scientific collection made by a member of the museum staff during his term of office shall, unless otherwise authorized by resolution of the regents, belong to the state and form part of the state museum.

§ 56 **Indian collection.** There shall be made, as the Indian section of the state museum, as complete a collection as practicable of the historical, ethnographic and other records and relics of the Indians of the state of New York, including implements or other articles pertaining to their domestic life, agriculture, the chase, war, religion, burial and other rites or customs, or otherwise connected with the Indians of New York.

§ 1115 **Transfers from state officers.** The librarian of any library owned by the state, or the officer in charge of any state department bureau, board, commission or other, office may, with the approval of the regents, transfer to the permanent custody of the state library or museum any books, papers, maps, manuscripts, specimens or other articles which, because of being duplicates or for other reasons, will in his judgment be more useful to the state in the state library or museum than if retained in his keeping.

## THE FUNCTIONS OF THE STATE MUSEUM

"The Museum is the natural scientific center of the State government; it is the natural depository of all the material brought together by the state surveys; it is the natural custodian of all purely scientific state records; it is the natural center of the study of the resources of the State as a political unit; it must maintain its capacity for productiveness in pure scientific research—pure science has been the justification of the State Museum from the beginning of its history. * * * In brief, the distinctive sphere and scope of the State Museum corresponds with the scientific interests and welfare of the people within the geographic boundaries of the State.

"The truest measure of civilization and of intelligence in the government of a state is the support of its institutions of science, for the science of our time in its truest sense is not the opinions or prejudices, the strength or weakness of its votaries, it is the sum of our knowledge of nature with its infinite applications to State welfare, to State progress and to the distribution of human happiness."—*Henry Fairfield Osborn, an address delivered at the dedication of the New York State Education Building, October* 15, 1912.

## THE FUNCTONS OF A MUSEUM

"A museum is an institution for the preservation of those objects which best illustrate the phenomena of nature and the works of man, and the utilization of these for the increase of knowledge and for the culture and enlightenment of the people.

"In addition to local accessories, the opportunity for exploration and field work are equally essential, not only because of considerations connected with the efficiency of the staff * * * but in behalf of the general welfare of the

institution. Other things being equal, exploration can be carried on more advantageously by the museum than by any other institution of learning, and there is no other field or research which it can pursue to better advantage.

"To aid the occasional inquirer, be he a laboring man, schoolboy, journalist, public speaker, or savant, to obtain, without cost, exact information upon any subject related to the specialties of the institution; serving thus as a 'bureau of information.'

"A museum to be useful and reputable must be constantly engaged in aggressive work either in education or investigation, or in both.

"A museum which is not aggressive in policy and constantly improving can not retain in its service a competent staff and will surely fall into decay.

"A finished museum is a dead museum, and a dead museum is a useless museum."— *G. Brown Goode, formerly assistant secretary, Smithsonian Institution.*

## Museum Committee of the Board of Regents

WM LELAND THOMPSON, *Chairman*
JOHN LORD O'BRIAN
WILLIAM BONDY

## State Museum Council

BENJAMIN WALWORTH ARNOLD
THOMAS D. THACHER
OWEN D. YOUNG
PIERREPONT B. NOYES
ORANGE L. VAN HORNE

## State Museum Staff

Charles C. Adams Ph.D., D.Sc.....*Director of the Museum*
Alvin G. Whitney A.B[1].....*Assistant Director and Secretary*
Jacob Van Deloo [2].....*Secretary*
Rudolf Ruedemann Ph.D.....*State Paleontologist*
David H. Newland B.A.....*State Geologist*
Robert D. Glasgow Ph.D.....*State Entomologist*
Homer D. House Ph.D.....*State Botanist*
Chris A. Hartnagel M.A.....*Assistant State Geologist*
Winifred Goldring M.A.....*Associate Paleontologist*
Sherman C. Bishop Ph.D.[3].....*Zoologist*
Kenyon F. Chamberlain.....*Assistant State Entomologist*
Elsie G. Whitney A.M.[4].....*Assistant State Botanist*
Noah T. Clarke.....*Archeologist*
Neil Hotchkiss M.A.[5].....*Technical Assistant*
Edwin J. Stein.....*Technical Assistant*
Walter J. Schoonmaker.....*Technical Assistant*
Arthur Paladin.....*Technical Assistant*
Clinton F. Kilfoyle.....*Technical Assistant*

[1] Appointed April 1, 1929.
[2] Retired November 1, 1928.
[3] Resigned August 31, 1928.
[4] Appointed April 15, 1929.
[5] Resigned February 16, 1929.

## Honorary Curators

William L. Bryant.....*Honorary Curator of Fossil Fishes*
Benjamin W. Arnold.....*Honorary Curator of Ornithology*
Harry S. Peck.....*Honorary Curator of Minerals*

## Collaborator

Professor George H. Hudson

## Temporary Scientific Appointments

R. J. Colony M.A.....*Assistant Geologist*
Nelson C. Dale Ph.D.....*Assistant Geologist*
A. F. Buddington Ph.D.....*Assistant Geologist*
Allen C. Tester Ph.D.....*Assistant Geologist*
L. W. Ploger M.S.....*Assistant Geologist*
Aretas A. Saunders Ph.B.....*Assistant Zoologist*
F. W. Emerson Ph.D.....*Assistant Botanist*
William L. Lassiter M.A.....*Assistant Historian*

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Figure 23 Penobscot Council Belt. Used to symbolize the authority for the Council's action.

Figure 24 Fort Stanwix Treaty Belt. Passed at the signing of the treaty between the Six Nations and the United States at Fort Stanwix on October 22, 1784.

Figure 25 Small wampum of unknown origin.

Figure 26 Council Summons Belt. Used in calling a meeting of various clans. It has been referred to as an alliance between the Iroquois and the Seven Nations of Canada.

Figure 27 Treaty Belt Signifying "friendship" by its white background, and "support" by the diagonal bars, of which it originally had five.

Figure 28 Remembrance Belt. Variously interpreted as signifying some treachery. The cross was used, on occasion, to signify French Canada. In this instance it possibly denotes a guarded path to the council fire.

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Figure 31 Huron Alliance Belt. Commemorating an affiliation with a neighboring tribe. It became a Seneca belt in 1650 and was removed to Canada after the American Revolution.

Figure 32 Ransom Belt. It was a symbol for the authority invested in women to intercede on behalf of prisoners.

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Figure 34 Wing, or Dust Fan of Council President. The Ever-growing Tree which was displayed whenever the constitution of the Six Nations was recited. The widest belt known to exist.

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Figure 37 Alliance Belt. Once thought to have marked the admittance of the Tuscaroras in 1713 to the League of the Five Nations. It, however, originally contained seven diagonal bars instead of six.

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Figure 43 Hospitality, or Welcome Belt. Reputed to be a Canadian Mohawk belt used by the presiding officer in welcoming visiting delegates to the council.

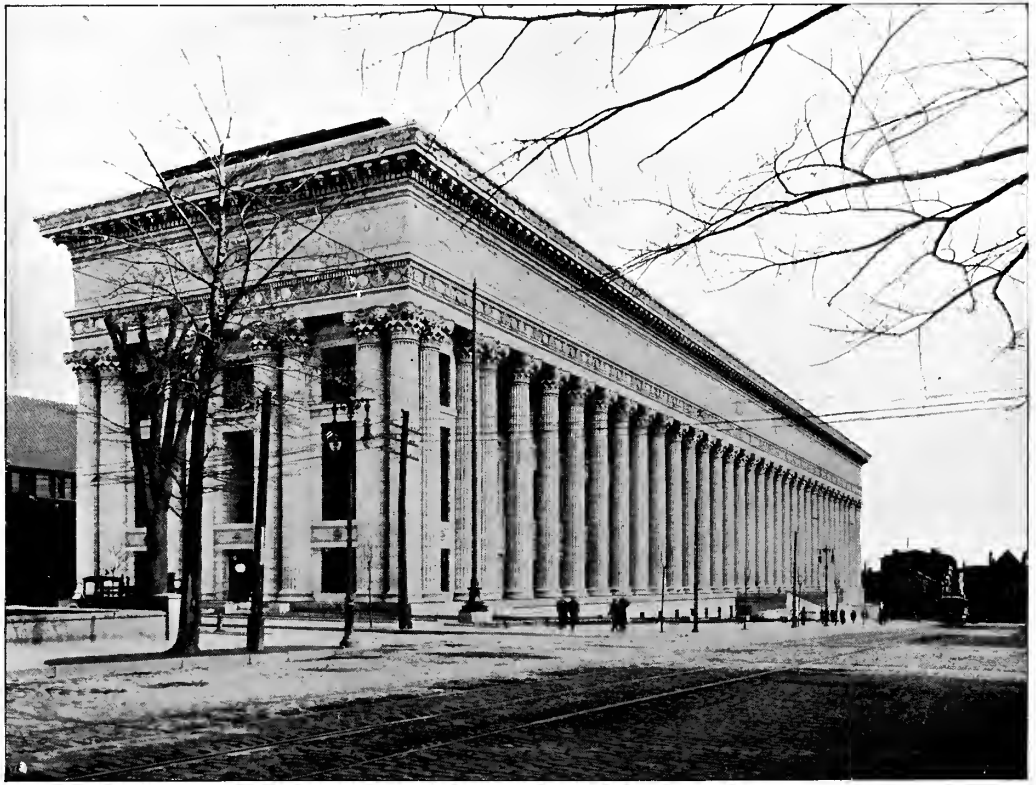

FIGURE 1 New York State Education Building

On the upper floors is the home of the New York State Museum

# TWENTY-FOURTH REPORT OF THE DIRECTOR OF THE DIVISION OF SCIENCE AND THE STATE MUSEUM

By Charles C. Adams Ph.D.

## FOREWORD

Although the Division of Science and the State Museum has been constantly engaged in scientific and economic studies of the natural resources of the State for more than 90 years, there are many citizens who have no definite idea of what this state fact-finding bureau does or has been doing for this period beyond its museum exhibits. During its long history there has been a natural growth and development so that its scientific, economic and industrial studies, surveys and collections illustrating the mineral, plant and animal resources, as well as the history and industries of the State, have become of great value and importance. *This agency is today the central official state scientific, historical and industrial research and museum agency, viewed in its most comprehensive sense.* The museum exhibits are in reality a permanent exposition of the State's natural resources—mineral, plant, animal and human, although of course, all aspects have not been equally developed for lack of space and funds. Interesting and important as are the exhibits to the general public, however, they do not represent the most important part of the work of the Division of Science and the State Museum, because its major activities consist of state wide, scientific and economic studies by its staff, of the mineral, plant, animal and human resources of the State in their economic and social aspects. These fact-finding studies are of the utmost importance and were so recognized nearly 90 years ago, before the State had become so thoroughly urbanized and industrialized. At that time the older survey methods alone were satisfactory, and although certain of these older methods must be continued indefinitely, they are in themselves inadequate for the present intensive industrial use which characterizes modern times. The next important step of advance is to provide adequately for more intensive scientific and technical studies, both in the field and in the laboratories, in order to adapt these studies more thoroughly to modern times. Adequate space for the laboratories, offices, storage facilities and exhibition rooms that are now necessary can be provided for only by a new modern museum building.

This report covers the fiscal year ending June 30, 1929, and its field is restricted to administrative matters, and to allied museum and scientific policies.

## A SUMMARY OF THE YEAR'S WORK

Among the outstanding results of the fiscal year has been the continuation of the state wide, scientific surveys of the geology and natural history of the State. Of the 279 quadrangles of the federal topographic maps covering this State, modern geological work has been published by the Museum on only about 66 quadrangles. The state work is yet incomplete or is unpublished on about 16 quadrangles. These quadrangles range from 212 to 227 square miles in area. Such surveys are never completed, at least so long as the State is prosperous, because new economic and social conditions are constantly arising and making new uses and new demands upon these resources. During the present year intensive field studies were continued on the following eight quadrangles—Hammon, Antwerp, Oswegatchie, Schunemunk, Randolph, Cattaraugus, Berne and Catskill, thus representing the western, northern and southern parts of the State. A special comprehensive economic study was begun of the limestones in the lower Hudson valley, with particular attention to their relation to the cement industry.

The regular annual compilation of the statistics of the mines and quarries of the State has been continued in cooperation with the United States Bureau of Census and the Bureau of Mines. This gives us the best summary of the activity in this field and shows that the State stands eleventh among the states in the value of its mineral products, amounting to over $112,000,000.

The biological survey of the plants about the vicinity of Oneida lake and also in the Allegany State Park has been continued. A popular handbook on the fleshy fungi, the mushrooms and their allies, has been completed and will soon be printed. This very valuable gift to the Museum was made by the cooperation of Dr Howard Kelly of the Johns Hopkins University, Dr C. H. Kauffman of the University of Michigan Herbarium, and Charles M. Winchester sr, of Albany, N. Y. This handbook, with its numerous drawings, photographs and beautifully colored plates, will be a valuable and convenient botanical contribution that will prove of much educational and popular interest.

Cooperative studies of the corn borer were continued with the State Department of Agriculture and Markets, and a study was

begun of a greenhouse cockroach and the narcissus bulb pests of Long Island, with the same department, and in cooperation with the proprietors of the greenhouses and certain producers of these bulbs. Another cooperative project was begun on the insect pests of ornamental trees and shrubs. Residents of the Adirondacks, having become keenly aroused over the great discomfort and economic loss to the region by blackflies, punkies and mosquitoes, called upon Governor Roosevelt for assistance. The matter was referred to the State Museum, and the State Entomologist revived the efforts, begun nearly 30 years ago, but discontinued for lack of funds, to study these insect pests with an idea of improving conditions about human habitations. As Museum funds were inadequate for this problem, private subscriptions were pledged to finance the survey, which began in June just as this report closes.

The general zoological studies have included a continuation of a survey of the mammals about the vicinity of Albany, giving special attention to the economically important woodchuck. A handbook has been completed on Bird Song, giving an excellent popular account of this phase of birds and adding greatly to our original knowledge of this subject. A field study and report was begun on birds' nests, another subject of general and educational interest.

In the field of history and archeology the most significant addition has been an important collection of household and agricultural objects and implements presented by Silas W. Smith of Glens Falls and Harriet E. Lutman of Painted Post, N. Y.

The Museum exhibits continue to attract more than 200,000 visitors annually and thus furnish to the public recreational education to the value of at least $200,000 a year.

Interest has increased in the plans of the Legislative Commission (for 1925) for a new State Museum building, facing the Education Building, on State street in Albany, thus completing the proposed civic center. The proposed building would house not only the scientific and historic collection of the State Museum but would be a permanent exposition of the resources of the State in relation to industry, science and education.

## COOPERATION WITH STATE AND OTHER ORGANIZATIONS

The location of the Division of Science and the State Museum at Albany greatly facilitates cooperation with other branches of the State Government. The extensive files of records and the large

study collections make it the natural repository and a bureau of information on a great variety of subjects falling within the field of the Museum. This central state agency has cooperated with other bureaus as follows:

1 United States Bureau of Mines and the Bureau of Census, Washington, D. C. On the annual state census of mineral statistics.

2 New York State Department of Agriculture and Markets. Cooperative experiments on the control of greenhouse and bulb pests.

3 New York State Department of Conservation. The Director of the Museum is a member of the State Council of Parks.

4 State Department of Law, Office of the Attorney General. Cooperation with Office of Land Titles on the purchase of mineral lands in the Adirondacks and on other legal problems.

5 State Department of Public Works. On the geological conditions on the site of the State Prison at Attica.

6 Buffalo Society of Natural Sciences, Buffalo, N. Y. Cooperation on the conduct of the Allegany School of Natural History in the Allegany State Park.

7 University of Buffalo, Buffalo, N. Y. Affiliated with the Allegany School of Natural History.

8 Colgate University, Department of Geology and Geography, Hamilton, N. Y. Cooperation on a geological survey of the Morrisville Quadrangle.

9 Cooperation within the Education Department: State Library, exchanges of Museum publications; Archives and History Division; Department Editor, on the publication of Bird and Arbor Day numbers of the Bulletin to the Schools, and the State Board of Geographic Names.

10 Dr Rudolf Ruedemann has cooperated with more than 30 geologists in the preparation of a two-volume Geology of North America.

11 Dana Natural History Society. Cooperation on a lecture on birds to Albany school children, on Bird Day, by Edward Avis.

12 American Society of Mammalogists. The Director was a member of two committees; one on wild life sanctuaries and the other on the study of life histories of mammals.

13 Princeton University, on geological survey of the Potsdam and Rosendale Quadrangles.

14 Armstrong Brothers of Poughkeepsie, on a study of the insect pests of ornamental shrubs and trees.

15 Several Long Island narcissus bulb growers have actively cooperated financially with the State Entomologist, of the Museum staff, on methods of controlling the insect pests of these plants.

16 Residents of the Adirondacks sought the cooperation of the State Entomologist of the Museum to assist in improving the black fly, mosquito and punkie conditions about habitations. They assisted in a substantial manner financially.

## ALLEGANY SCHOOL OF NATURAL HISTORY

The second session of the school began July 7 and closed August 25, 1928. This is an outdoor school of natural history conducted in cooperation with the Buffalo Society of Natural Sciences in affiliation with the University of Buffalo and with the hearty cooperation of the Commissioners of the Allegany State Park. The State Museum is responsible for the educational policy of the school, and it furnishes a field base for members of the Museum staff who are conducting the geological and natural history surveys or special researches in the Allegany Park and its vicinity.

This is the first and only school of this character in the State, and it supplements the customary teaching in the natural history sciences, that are taught primarily by the laboratory method in schools and colleges.

The supervision of the camp and the furnishing of lodging, board etc. for the school are conducted by the Buffalo Society of Natural Sciences, of which Mr Chauncey J. Hamlin is president and, as well, a Commissioner of the Allegany State Park. Throughout the plans for this school it has had the cooperation of the Commissioners of the Allegany State Park, the president of which is A. T. Fancher. An Announcement and a Circular give details regarding the conduct of the school. Dr R. E. Coker is the director of the school. His report on the sessions of 1927 and 1928 and other publications on the school are listed below:

**Coker, R. E.** 1929. Allegany School of Natural History. First Annual Report. 67th Ann. Rep't Buffalo Soc. Nat. Sci., p. 44–59.
——— 1929a. The Allegany School of Natural History. Second Annual Report. 68th Ann. Rep't Buffalo Soc. Nat. Sci., p. 66–74.
**Taylor, Norman.** 1928. The vegetation of the Allegany State Park. N. Y. State Mus. Hdbk. 5:1–126
**Zimmer, Carl.** 1929. Die Allegany School of Natural History. Der Naturforscher, 6 Jahrgang, p. 41–44 (illustrated)

The geological and natural history studies and surveys conducted for the Museum at the school include geological work by Professor

A. C. Tester, on the Randolph quadrangle; and studies of the vegetation of the "Big Basin," a large forested tract, by Dr F. W. Emerson. Norman Taylor's Handbook, The Vegetation of the Allegany State Park, has now been published. A. A. Saunders began a special study of the butterflies of the park region. These studies and publications not only give a popular account of the region that is of value to the school, and to the visitors and campers in the park, but are likewise a contribution to the natural history and biological survey of the State. The handbooks already published have proved to be of considerable value to the schools and colleges of the State and elsewhere.

## RELATION OF THE MUSEUM TO SCHOOLS AND COLLEGES

(Figs. 2 and 3)

The relation of the Museum to the school system and colleges of the State (and to other states) includes the extensive distribution of its various publications, also the volumes and portfolios of colored plates of birds and wild flowers, and as well, cooperation with the Department Editor, on the Bird Day and Arbor Day numbers of Bulletin to the Schools. For many years it has also been the custom to cooperate with the Dana Natural History Society of Albany, on a public lecture on birds for the Albany school children.

The records of the Museum custodian or guide show that 175 classes of pupils visited the Museum during the year. The following 21 counties were represented: Albany, Greene, Rensselaer, Schenectady, Columbia, Washington, Montgomery, Herkimer, Dutchess, Warren, Schoharie, Delaware, Broome, Oneida, Bronx, Fulton, Chenango, Rochester, St Lawrence, Otsego and Madison. These school children came largely by bus or automobile. This is a very creditable showing for the schools and is a phase of school work that deserves much more attention on the part of public school officials. Less than 20 per cent of these pupils were required to make a report on their excursion. It would be well for most teachers to request such reports. Copies of the reports which have come to the Museum in the past show that these children gain much from these visits.

The classes from the cities average 35 and from the rural districts about 20 pupils. The college students from Albany, Schenectady, Troy and Williamstown, Mass., visit the Museum regularly. The total pupil and student attendance was 4750.

Frequent requests come to the Museum from teachers and school officials for loan collections, or assistance on the unidentified collections which they already have but can not use properly.

## MUSEUM ATTENDANCE

The total attendance estimate for the year is about 210,000 visitors. The Sunday attendance, by actual count, is 46,321. The greatest number on a single day was February 17, 1929, with an attendance of 2326.

From about June 1st to Labor Day, the active tourist season, the visitors are from all parts of the United States and Canada. To these tourists the State Museum is the main permanent state exposition of the natural resources of the State. These visitors give much time and attention to the exhibits and show a keen appreciation of what they see. It is not unusual for them to spend several hours looking over the exhibits.

At a time when there is considerable talk about the need of advertising the State, there is not a full appreciation of the value of these exhibits and how the value could be increased if they were expanded as they should be.

The attendance for the remainder of the year is mainly from citizens of the State, while the Sunday visitors are largely those from Albany and vicinity. Those attending the many conventions in Albany often visit the Museum.

The preceding calculations show that for a city the size of Albany this is a large attendance. It is fair to estimate that the people of the State and their summer touring guests are annually receiving educational recreation free that would otherwise cost them over $200,000, or nearly three times as much as the annual budget of the State Museum.

## INFORMATION AND PUBLICITY

There has been the usual amount of correspondence with those seeking information on the natural resources and the plant and the insect pests. The limited funds available for traveling tend to discourage the staff from making lecture engagements, unless such engagements are able to provide these for the speakers. In spite of this limitation the staff has given 24 lectures and has reached about 1500 persons, in nine counties, as follows: Albany, Dutchess, Hamilton, Herkimer, Monroe, Onondaga, Schenectady, Suffolk and Westchester. One lecture was given out of the State.

Assistance is given the press whenever possible, and the Announcement of the Allegany School of Natural History and its advertisements in the magazines have helped to reach a larger public.

## CONDITION OF THE EXHIBITION HALLS, EXHIBITS AND STUDY COLLECTIONS

The exhibition halls have been considerably improved by repairing the leaks in the skylights, and there has been progress on the refinishing of the walls, particularly in Zoology Hall. The stonework throughout the exhibition halls was cleaned during the winter months, and also the skylights in the Hall of Paleontology. The renovation of the exhibit of mounted fishes has been begun by Mr Paladin. The locks on many cases in Zoology Hall have been repaired and the doors fitted. The crowded condition of the halls and limited funds have retarded the progress of new exhibits. This is an unfortunate condition because the visiting public tends to lose interest in exhibits that do not change.

The most notable additions to the collections, besides those made by the staff during regular field work, have been the gift of the Hudson Collection of insects and the Smith and Lutman collections of historic objects. The additions to the collections are given in the list of Accessions.

Dr Glasgow reports as follows on the Hudson Collection:

An extremely valuable collection of insects has been given to the New York State Museum by Professor George H. Hudson, who, previous to his recent retirement, had served for many years as head of the department of biology of the New York State Normal School at Plattsburg. This collection contains more than 10,000 specimens, and includes several types. It is particularly rich in butterflies and moths, but many of the other major groups of insects, like those which include, respectively, the beetles, the flies, the bees and wasps, the grasshoppers, the true bugs, the tree hoppers, the dragon flies, and several other groups, are well represented. The collection was made almost entirely at Plattsburg and in neighboring territory, and brings to the State Museum an excellent representation of the insects of the extreme northeastern part of the State.

The lack of satisfactory and safe storage space is a very serious menace to the collections and the growth of the Museum. This condition is growing more acute each year, and the only real solution seems to be a new building for the exclusive use of the State Museum.

## PRINTING AND PUBLICATIONS

"After all it is the written word that lives."
—*Dr W. M. Beauchamp*

In the case of a fact-finding and research organization such as the Museum, publication is a vital necessity. It is one of the best tests of its functional ability and efficiency. The quality and quantity of its publications are thus of the greatest importance. The constant demand throughout the scientific and scholarly world for the Museum publications, and the great quantity of publications sent to the Museum and the State Library in exchange for them, show that the public values them highly. A large number of other states conduct investigations similar to those of the Museum on various phases of geology, paleontology, botony, zoology and history, including archeology and ethnology, and are therefore eager to exchange their publications for our own. This demand has been an important influence in building up the State Library series of public documents.

Scientists are often willing to work for the Museum, even on inadequate salary, with the prospect that the Museum will print their results, as part compensation for their work. Prompt publication is only fair to authors under such circumstances.

Under the present policy, the sales of the Museum publications have returned to the State many thousands of dollars. The clerical labor and expense of caring for this is a severe drain on our limited help, and yet none of these funds are available to continue the production of new or similar works. In fact, the more successful and popular a publication is, the more the Museum is penalized by the extra work demanded to care for requests with no corresponding increase of help and funds to meet these demands.

A revolving fund, large enough to function for at least 10 years, would aid this situation. Sales would replenish it and allow a certain amount of flexibility that would hasten publication. Annual provision could be made to care for the free copies, such as exchange to other states, libraries, educational institutions etc., which should not be allowed to drain the revolving fund. Permission could also be given for the use of such materials for legitimate educational purposes meeting with the approval of the Regents.

The inventory of the older publications continues slowly, but as rapidly as limited help can extend this work. It will require several years, at the present rate of progress, to complete this.

A gift of $2000 toward publication was expended during the year. This was greatly appreciated as it materially hastened printing.

The retirement of Jacob Van Deloo as secretary, upon whom much of the editorial work fell, in cooperation with the authors, ended a long and efficient service, particularly in connection with the printing work of the Museum. Mr Van Deloo's knowledge of the Museum publications was unsurpassed and the vast amount of work which he did on them was appreciated by the staff.

## PHOTOGRAPHY AND DRAFTING

Important additional photographic equipment has been secured, so that field parties are improving their photographs. Mr Stein made during the year 656 negatives, 1085 photographic prints, 27 enlargements, 75 lantern slides, many labels and 150 drawings.

Cameras and films are furnished by the Museum to the field parties, and the negatives are developed by Mr Stein. By this method a careful standardized treatment is secured in contrast with the usual unequal and often defective results.

A real beginning has been made on cataloging the negatives. This accumulation of years will require considerable time to complete, but it will simplify the work and ultimately save much time.

The amount of photographic work has increased considerably and more help is needed to care for it promptly. As soon as possible Mr Stein should be relieved of at least most of the storekeeping duties, as originally intended.

## HISTORICAL COLLECTIONS AND ALLIED MATTERS

(Figures 4–10)

"I warmly sympathize with the ambition expressed in your annual report to have this Museum more than a mere zoologic or scientific museum. It should be a museum of arts and letters as well as a museum of natural history. . . . There should be here a representation of all our colonial and revolutionary life. There should be in this museum for the instruction and inspiration of our people, a full representation of American history since the time when New York cast off its provincial character and became an integral portion of the American republic."—*Theodore Roosevelt's address at the opening of the New York State Museum, December 29, 1916.*

As a part of the general program to build up the general collections illustrating the history of the State, special attention is being given to preserve and commemorate important scientific achievements and the inventions of notable personages. The former Director, Dr John M. Clarke, was the leader in the movement to commemorate, in a beautiful bronze statue, Dr Joseph Henry's epoch-making discoveries in electro-magnetism (figures 4 and 5). Although Doctor Clarke initiated this plan he did not live to see its realization, which was concluded under the auspices of the

Albany Institute of History and Art and the Albany Academy. The sculptor is John Flanagan. On October 18, 1928, took place the unveiling of this statue, which stands in front of the Albany Academy, where Henry rang the first bell by electricity. For earlier accounts of this movement see:

**Clarke, J. M.** 1918. Thirteenth Report of the Director of the State Museum and Science Department for 1916. N. Y. State Mus. Bul., 196:14
——— 1919. Fifteenth Report of the Director of the State Museum and Science Department. N. Y. State Mus. Bul., 219–20:14–15
**Finley, J. H.** 1928. Doctor Finley Speaks at Unveiling of the Henry Monument. Univ. State of N. Y. Bulletin to the Schools, 15:62
**Gerhardi, Bancroft.** 1917. Joseph Henry's Experiments in the Albany Academy, 1827–32, Interpreted in the Light of the Present Day. p. 1–12. Univ. State of N. Y. (only 300 copies printed)
**Rice, E. W.** 1916. The Debt of Electrical Engineering to the Work of Joseph Henry in Albany. Proc. 52d Convocation, Univ. State of N. Y. October 1916, p. 217–22
**Walcott, C. D.** 1926. Joseph Henry—Researcher and Administrator. Univ. State N. Y. Bul., 844:121–27
**Carty, J. J.** 1920. Science and the Industries. Reprint and circular Ser., National Research Council, 8:1–16. (Figures, apparatus used by Joseph Henry)

The problem of securing public support for high class scientific and educational work has always been a most difficult problem. New York State has been no exception to the rule. Dr James Hall, who conducted the state geological work for so many years with distinction, experienced the whole gamut of these difficulties. At a particularly trying period Honorable Danforth E. Ainsworth, Speaker of the Assembly of the New York Legislature, came to the support of Doctor Hall and was helpful in securing appropriations for Doctor Hall's work during his terms in the Assembly in 1893, 1894 and 1895. Later when he joined the staff of the Department of Public Instruction he did all he could to forward the work up to the time of Hall's death in 1898. In recognition of this assistance Doctor Hall had prepared gold medals which he presented to several of his devoted supporters. The one to Mr Ainsworth reads as follows: "To Hon. Danforth E. Ainsworth, Legislator and Statesman. In recognition of Public Services to Science. In aid of one of its votaries, April 1893 to April 1895. Gratefully Acknowledged. James Hall. 1811–1895." On the obverse is a portrait of Doctor Hall, as shown in figure 6.

Mr Ainsworth promised to present this to the Museum, and after his death on October 25, 1927, the executor of the estate deposited it with the Museum. The Regents, on April 18, 1929, voted: "That the gift of the gold medal presented to the late Honorable Danforth E. Ainsworth by Dr James Hall be accepted, and that the

Director of the State Museum be authorized to send a suitable letter of thanks and appreciation on behalf of the Board of Regents to the members of Mr Ainsworth's family."

A brief account of Assemblyman Ainsworth's relation to Doctor Hall is given in Dr John M. Clarke's Life of James Hall, p. 531; 1923.

There were several of these medals presented to friends. One is now in the possession of Mrs George Huntington Williams, to whose father, Senator Daniel P. Wood, (cf. Clarke, p. 462) it was presented.

As mentioned elsewhere in this report, the most important additions to the historic collections have been those derived from Silas W. Smith, Glens Falls, N. Y., and Harriet E. Lutman, Painted Post, N. Y. These are largely household and agricultural articles, several of which are of special interest.

In the preceding Annual Report attention was called to the growth of the Shaker Historic Collection (figures 7–10). Only a few such collections of any considerable size and completeness exist, not excepting library collections. In many respects libraries and museums have similar historic development, the libraries often being several years in advance of the museums, and this is true in this instance. A valuable library collection of Shaker books, documents and manuscripts has been collected by the New York State Library (Wyer, J. I., 111th Ann. Rep't, N. Y. State Library. Univ. State of N. Y. Bul., 920, p. 51, 1929) which is probably the second valuable one in New York State. Doctor Wyer states: "A collection of 75 volumes, 420 pamphlets, 56 broadsides, and 135 manuscripts printed by or treating directly of Shaker history and polity. Over 550 titles are included, 80 of which are not in the MacLean bibliography of Shaker literature, published in 1905."

The three largest collections in the world of Shaker library materials are in the Congressional Library at Washington, in the Western Reserve Historical Society at Cleveland, Ohio, and in the New York (City) Public Library (cf. U. S. Bur. Edu. Bul., 1912, no. 23, p. 26; and Cathcart, Ohio Arch. and Hist. Soc. Pub., vol. 35, p. 464–68, 1927). It is worthy of special attention to observe that it is only outstanding and important libraries that possess these Shaker materials.

It is difficult to locate and determine the relative importance of collections of historic objects or museum collections. Professor John Uri Lloyd of Cincinnati states that near Lexington, Ky., at Shakertown, "is a large brick building now a museum of antique

furniture. In it they have the furniture and many of the implements used by the Shakers. If I am correctly informed these things are not for sale but are kept as a Shaker museum."

A small Shaker collection is on exhibition at the Museum of Natural History and Art, Pittsfield, Mass. There is also a collection at the Connecticut Valley Historical Society at Springfield, Mass. Clara Endicott Sears has a valuable exhibit housed in an old Shaker dwelling at Harvard, Mass. (Harriet E. O'Brien, Lost Utopias. Boston. 1929. There is also a small Shaker collection at the Schenectady County Historical Society, Schenectady, N. Y. These are the only collections which the State Museum has discovered. Of course there are many examples of Shaker furniture, and particularly Shaker chairs, in private homes. At present the Shaker collection in the New York State Museum is the largest and the most important one in any Museum.

## SCIENTIFIC STAFF AND ITS ACTIVITIES

"It is essential that this Museum should command the services of many different men for work in many different fields, and that its work should be so closely related to work of the same kind elsewhere that it shall all represent a coordinated whole. This is true of all departments of the work, but especially so of those departments which have a direct utilitarian bearing.

"This Museum, like every other institution of the type, should do everything to develop large classes of workers of this kind. And yet, friends, we must never forget that the greatest need, the need most difficult to meet, is the need to develop great leaders and to give full play to their activities. In the entirely proper effort to develop numbers of individual workers there must be no forgetfulness of this prime need of individual leadership if American achievement in the scientific field is to be really noteworthy. Yet in scientific as well as in historical associations and academies, this fact is often forgotten.

"The really great works must be produced by some individual great man who is able to use to the utmost advantage the indispensable preliminary work of a multitude of other observers and investigators. He will be the first to recognize his debt to these other observers and investigators. If he does not do so he will show himself a poor creature. On the other hand, if they are worth their salt they will be proud to have the great architect use all the results of their praiseworthy and laborious and necessary labor in constructing the building which is to crown it."—*Theodore Roosevelt's address at the opening of the New York State Museum, December 29, 1916.*

A modern fact-finding organization, such as the State Museum, consists of its scientific and scholarly staff, its collections for study and for exhibitions, and its equipment in the form of offices, laboratories and minor facilities for work in the field or laboratory. The staff of a museum corresponds to the faculty of a university, and the quality of its research depends upon the character of their ability. In addition to their office, administrative and curatorial routine the main activities of the staff for the past year are indicated as follows:

**Geology.** Doctor Ruedemann completed his Bulletin on the Geology of the Capital District—Albany, Troy, Schenectady and Cohoes, and his report is authorized for printing. This region is undergoing intensive industrial development so that the results will be of great value to local industries and to their public policies. Assisted by Mr Kilfoyle, he has also made progress on the mapping of the eastern two-thirds of the Catskill quadrangle. Continued progress has been made in Doctor Ruedemann's monograph of the graptolites of North America, which has been under way for several years. Progress continues also on his comprehensive work on the Geology of North America, which is being written with the cooperation of about 30 geologists.

Miss Goldring has continued the mapping of the Berne quadrangle and has about one-third of it completed. She completed the manuscript of Part 1, of Handbook 9, intended for beginners of paleontology, and its printing has been authorized. About one-half of the manuscript of Part 2, has been prepared, on stratigraphy.

Mr Newland's report on the gypsum resources and the allied industries of the State has been completed and is being printed. Gypsum has become one of the most valuable mineral resources of the State, on account of its relation to modern fireproof construction. The regular annual joint statistical report on the mining and quarry industries by Mr Newland and Mr Hartnagel, has been prepared for 1925–26. Plans were made for a comprehensive report on the limestones because there has been an immense expansion of the portland cement industry. The State contains exceedingly valuable deposits which should be studied from the standpoint of modern industrial needs. Mr Newland was given a special leave to conduct geological work in Australia, from May 15 to November 1, 1929, and during that period Robert W. Jones, formerly an ecologic geologist of the Museum staff, substituted for Mr Newland and began a careful field study of the limestones of the lower Hudson valley. Mr Hartnagel continues the preparation of a report with Dr W. L. Russell, on the oil fields and a similar report on the gas, with Professor Henry Leighton. He has also begun to assemble the facts on the underground water resources of the State, a subject which with increasing population and industrial development is becoming more important every year.

Professor A. C. Tester continued his field work on the Randolph quadrangle in the Allegany State Park, Professor N. C. Dale the field work on the Oswegatchie quadrangle, and Dr A. F. Buddington

on the Hammond and Antwerp quadrangles. Dr R. J. Colony is nearing the completion of the field work on the Schunemunk quadrangle, Dr Burnett Smith on the Skaneateles quadrangle, and Professor L. W. Ploger began work on the Cattaraugus quadrangle.

The preceding projects indicate that field work is being conducted on quadrangles in western, northern and southern New York, in the lower Hudson valley on the economic limestones, and the mining and quarry statistics throughout the State. The work is thus comprehensive and statewide.

**Plants.** Doctor House has continued his field work in the vicinity of Oneida Lake. Neil Hotchkiss has completed his field work and his report on the vegetation of the Tug Hill region, west of the Adirondacks. Doctor House and Mr Hotchkiss began a field study of the plants at the eastern end of Lake Ontario. Additions have been made to the list of plants of the State, and an effort is made to keep this list up to date.

Dr F. W. Emerson made an intensive study and vegetational map of the Big Basin area of the Allegany State Park.

Through the active interest of Dr Howard Kelly of Johns Hopkins University, Dr C. H. Kauffman of the University of Michigan Herbarium, and Charles M. Winchester sr, of Albany, a plan was made to prepare and to publish a popular handbook on the fleshy fungi of the State. L. C. C. Krieger began work August 15th and worked until December 1st, in preparing this report. The donors of this publication, previous to presenting it to the State Museum, granted permission to Mr Winchester to sell a certain number of copies in order to finance the project. Mr Krieger has the manuscript ready for publication. This handbook will contain 32 colored plates, numerous halftones and pen drawings, so that it will be a beautifully illustrated and useful work for beginners and amateurs and will doubtless be found useful by many botanists themselves.

**Insects.** Doctor Glasgow has continued, at Scotia, the corn borer experiments started by Dr E. P. Felt, in cooperation with the Department of Agriculture and Markets. With a change of the federal and state policy it seemed best to discontinue this project.

A brood of the 17-year cicada appeared during the 1928 season and was given careful study. A subtropical cockroach has been causing considerable injury to roses in greenhouses. This study has been conducted in cooperation with the owners of greenhouses and in cooperation with the Department of Agriculture and Markets. Newton G. Armstrong, of Poughkeepsie, has also cooperated in a study

of the insect pests of ornamental trees and shrubs. The Long Island growers of narcissus bulbs have been in serious trouble with insect pests and eel worms. The proprietors have given liberal financial support and hearty cooperation, as has likewise the Department of Agriculture and Markets.

Continued economic loss by residents of the Adirondacks, caused by the biting flies, such as the black fly, punkies and mosquitoes, during the early summer led to a concerted movement to improve conditions. Dennis Dillon, of Raquette Lake, began the movement, and the State Museum was called upon for assistance. The residents of the Adirondacks pledged funds to enable the Museum to continue studies which were begun in 1901, but which were interrupted for lack of funds, and thus enabled the State Entomologist of the Museum to secure assistance to extend the field study of these pests. The financial pledges which were made enabled the Museum to put two men in the field just as this report closes.

Mr Chamberlain has continued his studies of the lupine insects.

A. A. Saunders has continued his studies of the butterflies of the Allegany State Park region, and has in preparation a handbook on that subject. Such a publication will be of value not only to visitors to the park, but as well to the students of the Allegany School of Natural History and to the public schools.

**Animals.** Doctor Bishop resigned August 31, 1928, to accept a position at the University of Rochester at a greatly increased salary. Docotor Bishop's departure was a severe loss. The inadequate salary provided has prevented a satisfactory appointment to the position.

Mr Schoonmaker has continued his extensive studies of the local mammals about Albany and has made considerable progress on his report on this subject.

Mr Saunders' Handbook on Bird Song has been completed and is in type.

Edmund J. Sawyer, bird artist and field ornithologist, began in May a special report on birds' nests. There is great public interest in this subject but a convenient handbook has not been available.

**Archeology.** Mr Clarke has continued the important work of going over systematically the collections and exhibits and assembling all available data and records and filing this information in an orderly fashion.

Materials have been collected for a report on the wampums in the collection of the Museum. As this collection is historically one of

the most important, if not the most important, it is worthy of careful study and the results should be made available to the public. A second report has been prepared on the history and all available data in the construction of the Iroquois Indian Groups, another subject worthy of careful record.

**History.** Aside from the care of the historical collections the historical activities of the Museum consist largely of gathering as full data as is possible about all historic objects that are added to the collections. Only too often historic objects come into museums, lacking satisfactory authentication and documentation. The most valuable addition to the Museum collection during the past year is a valuable collection from Silas W. Smith, of Glens Falls, of old household and farm implements, including certain objects of special interest, and the Harriet E. Lutman collection of Painted Post, N. Y.

The Director has made a study of a state policy for historic and scientific reservations (N. Y. State Mus. Bul., 284:61–67. 1929).

## RETIREMENT OF JACOB VAN DELOO

On October 31, 1928, Jacob Van Deloo, Secretary of the Museum, retired on a pension after a continuous service to the State Geological Survey and the State Museum since December 1, 1887. During this long interval he had by his industry and ability worked up through several positions, from clerk, stenographer, secretary to temporary Acting Director on January 1, 1926. He began his work with Dr James Hall, and continued his work under succeeding directors —Merrill and Clarke, to the above-mentioned date. His outstanding achievement during this extensive period of service, in addition to his usual routine duties, was the supervision of the very large series of publications published by the Museum. These include hundreds of volumes, and many thousands of pages of reports, bulletins and monographs, with innumerable illustrations and hundreds of colored plates. This work has been done with unusual care and greatly to the credit of Mr Van Deloo. His knowledge of the publications of the Museum was unsurpassed.

The Board of Regents, at the meeting of November 15, 1928, voted: "That the Board receives with regret the notification of the retirement of Jacob Van Deloo, and hereby expresses its appreciation of his faithful service to the State over a long period of years."

## STAFF CHANGES

Mention has just been made of the retirement of Jacob Van Deloo as Secretary of the Museum. The position was not filled until April 1, 1929, when Professor Alvin G. Whitney, of the University of Michigan, accepted the position as Assistant Director and Secretary. His permanent appointment was made July 5, 1929. Formerly he was assistant director of the Roosevelt Wild Life Forest Experiment Station at the New York State College of Forestry at Syracuse.

Dr S. C. Bishop, the Museum Zoologist, resigned August 31, 1928, to accept a position at the University of Rochester, at a considerable increase in salary. In spite of the urgency of filling this vacancy at once, this has not been possible on account of the low salary available. Doctor Bishop had been a member of the Staff since May 8, 1916. He was particularly interested in reptiles, amphibians and spiders. He built up the study collections along these lines, and made them of considerable importance; the collection of spiders is rated as one of the few valuable collections of its kind in the United States. A part of his investigations yet remains to be published. His departure is a distinct loss to the Museum.

Neil Hotchkiss, technical assistant in botany, resigned February 16, 1929, to accept a position on the Biological Survey of the United States Department of Agriculture at a considerable increase in salary. His position was filled by Mrs Elsie Gibson Whitney, whose appointment as Assistant State Botanist began April 15, 1929. Mrs Whitney came to the Museum from the Herbarium of the University of Michigan.

The services of W. L. Lassiter were secured from July 16 to October 16, 1928, for special work in caring for and cataloging the Historic Collection. Considerable material was cleaned, wrapped and labeled for storage, and an improved system of cataloging was well started. These valuable collections can never be adequately cared for until the full time of a curator is devoted to them.

## MUSEUM COLLABORATORS

As a method of increasing the active cooperation of scientific and technical students and scholars, it was proposed to the Regents at the April 18, 1929, meeting, that a new group be established to be called Collaborators. There are a limited number of professionals and of amateurs whose special interests, knowledge and scholarship are such that it would be mutually advantageous for them to be associated with the Museum. Such students may profitably work on

the Museum collections or cooperate in field work and thus advance the activities in which the Museum is engaged. In response to this request the Regents voted, "That the Director of the State Museum be authorized to appoint technical and scientific persons as collaborators of the Museum, who will serve without pay as members of the Museum staff for periods not to exceed three years, unless renewed."

The first appointment was made in June 1929, when Professor George H. Hudson (retired) of the Plattsburg State Normal School, accepted. Professor Hudson has devoted a very active life to the study of insects and plants and to the geology of the vicinity of Plattsburg. It is hoped that he will be able to continue his studies of the large collection of insects which he presented to the Museum, and which is mentioned elsewhere in this report.

## MUSEUM COUNCIL

As a means of seeking advice and criticism on various kinds of departmental work, the Board of Regents appoints advisory councils. At the December 20, 1928, meeting of the Regents the following appointments were made to the Council of the State Museum, for terms of one, two, three, four and five years, respectively, from October 1, 1928: Benjamin Walworth Arnold, Albany; Thomas D. Thacher, New York City; Owen D. Young, New York City; Pierrepont B. Noyes, Oneida; Orange L. Van Horne, Cooperstown.

## ANNUAL FINANCIAL AND STATISTICAL SUMMARY

The following annual and statistical summary is for the fiscal year July 1, 1928, to June 30, 1929.

### THE MUSEUM BUDGET

The following budget does not include the cost of heat, light, janitor service, orderlies (watchmen), carpenters, painters and elevator men. Certain other items also are furnished by the Education Department, such as postage, stationery, express, freight, drayage in part, telegraph and telephone, and are therefore not included in the budget. Gifts of funds, in addition to that derived from the state appropriation, are indicated.

The traveling expenses have been budgeted, so that each member of the scientific staff is able to plan his work to the best advantage. As rapidly as possible it is hoped to extend this system to all expenditures.

## APPROPRIATIONS AND FUNDS FOR FISCAL YEAR
(July 1, 1928–June 30, 1929)

APPROPRIATIONS

| | |
|---|---|
| Salaries: | |
| Administrative staff | 9 000 00 |
| Scientific staff | 29 770 00 |
| Scientific assistants | 6 560 00 |
| Clerical, labor, etc | 9 000 00 |
| Total salaries | 54 330 00 |
| Equipment and supplies | 5 000 00 |
| Temporary services (scientific) | 3 000 00 |
| Traveling (of which not to exceed $200 is available for out-of-state travel) | 2 300 00 |
| Printing | 10 000 00 |
| Special fund for Sunday opening | 1 020 00 |
| Special fund for work on the Historic Collections | 399 43 |
| Total budget | 76 049 43 |
| *Gift Funds* | |
| Gift for printing | 2 000 00 |
| Total Museum expenditures | 78 049 43 |

## DIRECTORY DATA

*Name of Museum:* New York State Museum.
*Location:* Albany, New York, U. S. A.
*Name of Director:* Charles C. Adams.
*Name of Secretary:* Jacob Van Deloo[1]
*Name of Assistant Director and Secretary:* Alvin G. Whitney[2]
*Date of founding:* The Museum is the outgrowth of state surveys begun in 1835; formal organization of the Museum was in 1843.
*Open to the public:* Open week days from 9 a.m. to 5 p.m., and Sundays from 2 to 5 p.m. from October 7, 1928, to May 5, 1929: 30 days.

| | | |
|---|---|---|
| Total number of hours open to the public for the year | | 2518 |
| Number of members on scientific staff | 10 | |
| Number of scientific assistants, clerks and laborers | 12 | |
| Number of part-time employes | 8 | |
| Total staff | 30 | |

*Salary schedules*, 1928–29:

| | |
|---|---|
| Director | $6000 |
| Assistant Director and Secretary | 3000 |
| Scientific professional staff | 1620 to 4250 |
| Technical assistants (nonprofessional grade) | 1380 to 2000 |

*Hours and vacation:*

| | |
|---|---|
| Hours of work a week | 36¾ |

Vacation allowance comprises 24 working days of 6¾ hours, and all legal holidays.

[1] Retired November 1, 1928.
[2] Appointed April 1, 1929.

## FINANCIAL STATUS OF THE STATE MUSEUM 1912–1928

In order to orient and summarize the financial status of the Museum, a study of the finances for the period from 1912 to June 30, 1928, has been made. This statement is quoted from the last Annual Report (Bulletin 284). It was in 1912 that the Museum moved into its present quarters in the Education Building. Some of the outstanding conclusions to be drawn from the tabulation, covering a period of 16 years, are the following:

1 Total salary increases were from $35,340 to $49,960, an increase of $14,620, and with almost no increase in the number of members on the staff. This is an increase of about 30 per cent, during which the cost of living has increased about 75 per cent. This is not the normal growth for a rapidly expanding and prosperous State. During this interval private universities have conducted the greatest campaign for endowments ever known in the history of education.

2 The Museum has had a printing budget since 1924 of $8000, and prior to that there had been a great accumulation of unpublished manuscripts. The funds provided are wholly inadequate to meet the present current needs with no provision for catching up on the earlier accumulation.

3 Equipment and supplies, traveling expenses and expert scientific service funds, were lumped from 1912 to 1916, and remained at $10,000. The cost of all these has increased greatly. To date the Museum has had no automobiles and yet it is expected to conduct efficiently statewide geological and natural history surveys.

4 In 1917, for equipment and supplies and traveling expenses there was allotted by the Department $7000, and for expert scientific services there was appropriated $3000.

5 Between 1918 and 1920 the funds allotted for equipment and supplies were $5000 and for traveling expenses $2000 except in 1920, when there was an increase of $300 for traveling; by appropriation the scientific services continued at $3000.

6 *For the 10-year period from 1918 to 1928 there has been no increase for equipment and supplies or for expert scientific services, and only $300 for traveling expenses, which was made in 1920. Certainly this has been a stationary period.*

7 The Sunday opening guide services were contributed free by the staff to the public from 1912 to 1916, when the sum of $2500 was appropriated. This amount remained stationary until 1926, when it was increased $1000 and of this amount, $1020 was allotted

by the Department to the Museum staff for their services, and the remainder was used for compensation of other Department members concerned with the Sunday opening of the Education Building.

8 *For 16 years there has been no large important or steady advance or increase in the funds available for the State Museum.*

To interpret these facts in terms of practical conditions, let us consult an editorial in the *New York Times* for February 8, 1928, which stated: "That present living costs are more than 50 per cent above 1913 . . . the actual cost of living in the United States to have risen 74.4 per cent above 1913, in December 1918, and 116½ in June 1920, and to have been 73.4 above the pre-war level in the middle of 1927. Now comes a confirmatory computation by the New York Federal Reserve Bank . . . thereby reaching the conclusion that the present average level of prices is 73 per cent above that of 1913."

With this emphatic decline in the purchasing power of the dollar it is strikingly evident that the Museum appropriations and allotments for salaries have been so small that there has been in reality a *very decided relative decline in terms of the cost of living.* As a result of this the staff, not the State, has continued largely to maintain the high standard in the output of the Museum. There has been an extensive accumulation of unpublished reports. The funds available for equipment and supplies, traveling and temporary expert scientific services, have not advanced (only $300 for traveling) in 16 years beyond $10,000. For the Sunday opening of the Museum the funds remained about stationary.

The budget of the Education Department for the present fiscal year is over $83,000,000 and in 1912 it was over $8,000,000. When we consider that out of the current total budget for the Department of Education, the State Museum received only about $75,000, it is seen how very little relatively is devoted to the Museum. In New York City the city government for 1928 appropriated to the semipublic American Museum of Natural History for maintenance the sum of $434,000. In Buffalo, the second city in size in the State, the city appropriates for the work of the Buffalo Museum of Science, also conducted by the semipublic Buffalo Society of Natural Sciences, the sum of $149,000. Rochester allows a budget of $66,000 for its local Municipal Museum. The richest State in the Union provides its State Museum a budget of $75,000—and it is supposed to conduct statewide activities on that basis.

## SUMMARY

Some of the outstanding conclusions shown by the preceding summary are:

1 There has been a decline in financial support of the State Museum since 1912, during a period of unprecedented growth of other public museums in the State. It has been undernourished for many years.

2 The prestige of the Museum has been maintained during this prolonged lean period largely by the exploitation of the staff, who have stayed on with the Museum in spite of the inadequate salaries. The better men of the staff correspond in ability and professionally with the professors of our larger and better universities and research institutions, and yet the disparity in the salaries is glaringly apparent.

3 A second factor that has helped to prevent the deterioration of the Museum during this lean period has been gifts of funds to the Museum for the purchase of valuable objects and for the scientific reservations.

4 That the Museum has not been a parasite on the Education Department is shown by the fact that the Museum funds have not been increased, and therefore it has not been maintained at the expense of any other phase of the work in the Education Department.

5 During the interval that the Museum funds have been relatively stationary, the funds of the Department have increased enormously, and there has been no corresponding additional support for the Museum.

## NEEDS OF THE STATE MUSEUM

In the preceding pages the financial history of the Museum was summarized for the period of 1912–28,—the period during which the Museum has occupied its present quarters in the Education Building. The outstanding facts showed that during this interval of 16 years there had been no important increase in the appropriations for its work, commensurate with the radical changes in the economic and social conditions during this period. This great relative decline in public support, the hardships enforced upon the staff, and the decline in the purchasing power of the dollar, indicate that increased financial support is essential because the State is already suffering from this kind of false economy, and its prestige, as a leading State in these matters, is declining. Therefore the outstanding needs are:

1 **Budget.** The present Museum budget of about $75,000 should be increased greatly. We now have a small one such as any live municipality of 100,000 population might support. The Museum is now giving the public, from its public exhibits alone, educational recreation worth about $200,000 a year. The budget should within the next few years be increased to $250,000. It is impossible to conduct statewide work efficiently without automobiles, and provision should be made specifically for such necessary equipment.

2 **New Museum building.** The second major need is a new Museum building for the exclusive use of the State Museum and for the Office of State Historian, so intimately related to the historical collections of the State Museum. By law the State Museum is the central state repository for *historic objects* not otherwise provided for by law. These historical collections have been accumulated since 1843, but there has never been adequate space for their exhibition or storage. A new building should be constructed on a scale to house in a worthy, dignified and efficient manner these exhibits of the resources, history and achievements of the people of this State.

As a fact-finding and research organization, conducting statewide surveys of scientific and economic problems, satisfactory laboratories, offices, storage rooms, field equipment—including automobile and allied accessories—are essential if the work of the State is to be conducted as an efficient modern business.

For a statement of the latest official plan for a Museum Building, consult the Twenty-third Report of the Director of the Division of Science and State Museum (Bulletin 284).

3 **Trust funds.** Everyone knows that public support generally lags in supporting education and research. For this reason gifts, fluid funds and trust funds are needed to tide over these sluggish periods. In the past a number of the outstanding achievements of the Museum have come from such sources, such as the Iroquois Indian Groups and the scientific reservations, and doubtless this policy must be continued.

The attention of friends of the Museum is called to the fact that gifts up to 15 per cent of net income and all *bequests* to the Board of Regents of The University of the State of New York, *in trust* for the exclusive use of the State Museum, are exempt from federal taxation, under the Federal Revenue Act of 1918.

## MUSEUM ACCESSIONS FOR THE YEAR

Accessions are new additions to the Museum. These are classified into the following groups:

1 By donation: objects presented to the Museum

2 By exchange: for other Museum materials etc.

3 By purchase: payment from the Museum budget

4 By the staff: collected by the staff during official duties of any kind.

5 By transfer, from other state departments or other divisions of the State Government, as provided by law

Gifts to scientific and educational institutions are listed at the end of this section.

### BY DONATION

Adams, H. J., Albany, N. Y.
Specimens of cat flea, Albany, N. Y.
Alexander, Mrs Murray, Hamilton, Ont., Canada, through Dr A. C. Flick, State Historian, Albany, N. Y.
Coat and Chapeau worn by Major General John Taylor Cooper
Armstrong, Norman M., White Plains, N. Y.
Specimens of locust miner and hackberry butterfly, White Plains, N. Y.
Arnold, Benjamin Walworth, Albany, N. Y.
3 fossils, Ennis island, Lake Huron
Collection of shells, Ontario, Canada
Belanski, C. H., Nora Springs, Iowa
7 brachiopods from Iowa
Belmont Quadrangle Drilling Corporation, Bradford, Pa.
508 rock cuttings from Gilbert well no. 1, near Richburg, N. Y.
117 rock cuttings from Sawyer well no. 1, near Richburg, N. Y.
Blunt, Eliza S., New Russia, N. Y.
Pupal case of dog-day cicada, New Russia, N. Y.
Bowen, W. C., Albany, N. Y.
Trilobite, New Salem, N. Y.
Brown, C. A., Baton Rouge, La.
17 specimens of plants from central New York
2 specimens of plants from Pennsylvania
Burnham, S. H., Ithaca, N. Y.
93 specimens of plants from New York and Maine
Burmaster, E. R., Irving, N. Y.
Fossil fish, Silver Creek, N. Y.
Carter, Edward, jr, Cohoes, N. Y.
Stereoscopic photo of Shaker Church Settlement, Albany, N. Y.
Chadwick, C. H., Catskill, N. Y.
Fossil plant, Catskill mountains, N. Y.
Cole, Elwood, Saratoga Springs, N. Y.
Specimens of cocoons of a "pinching bug," Saratoga Springs, N. Y.
Commander, Donald, Batavia, N. Y.
Galls of the hickory gall aphid, Batavia, N. Y.
Connecticut Valley Historical Society, Springfield, Mass., through W. F. Adams, Springfield, Mass.
Collection of articles exhumed at the site of a French settlement in Onondaga county, N. Y., destroyed by the Indians in 1660
Ink horn from the field of Buena Vista
Corning, Edwin, Kenwood, N. Y.
Milk snake, Kenwood, N. Y.

Cosine, Frances M., Suffern, N. Y.
Moth, Suffern, N. Y.
2 underwing moths, Suffern, N. Y.
Crapser, Mrs William H., Catskill, N. Y., through Regent Wm Leland Thompson, Troy, N. Y.
Corn sheller
Davis, Edward E., Norwich, N. Y.
135 specimens of plants from Chenango county, N. Y.
Denslow, Rev. H. M., New York City
*Serapias helleborine* from Montgomery county, N. Y.
Dill, Mrs Helen N., Albany, N. Y.
Collection of archeological specimens from western and northern New York
Dobbin, Frank, Shushan, N. Y.
202 specimens of plants from Washington county, N. Y.
Eames, E. H., Bridgeport, Conn.
39 specimens of plants from New York and Connecticut
Ehlers, G. M., Ann Arbor, Mich.
3 graptolites from Michigan
Erickson, Mrs Eugene T., Millbrook, N. Y.
Parasites of arbor vitae leaf miner, Millbrook, N. Y.
Fairbanks, Mrs L. B., Bainbridge, N. Y.
2 specimens of plants from Chenango county, N. Y.
Fairman, Dr E. E., Lyndonville, N. Y.
*Sylpha americana,* Lyndonville, N. Y.
Ferguson, W. C., Hempstead, N. Y.
100 specimens of plants, Long Island, N. Y.
Follett, Louis E., Saratoga Springs, N. Y.
12 Revolutionary War soldier buttons from vicinity of Saratoga battlefield, Saratoga Springs, N. Y.
Folwell, N. T. 2d, Philadelphia, Pa., through Mrs Nellie G. Milligan, New York City
Admiral Sigsbee's inlaid chair
Goold, Arthur B., Babylon, N. Y.
Specimens of blister beetle, Babylon, N. Y.
Graves, Arthur H., Brooklyn, N. Y.
Specimens of lady beetles, Brooklyn, N. Y.
Graves, George S., Newport, N. Y.
Shoulder yoke
Wire belt
Gunn, S. C., Albany, N. Y.
Cocoon of Promethea moth, Albany, N. Y.
Cecropia moth, Albany, N. Y.
Hale, M. LeGrand, St Hubert's, N. Y., through Dr C. C. Adams, Albany, N. Y.
Carpenter's plane
Hostetter, Harry B., Lancaster, Pa.
Specimens of wood borers, *Monarthrum fasciatum* and *Neoclytus acuminatus,* Lancaster, Pa.
Houck, Mrs Leon, Walton, N. Y.
Specimens of Cecropia moth, Walton, N. Y.
Hudson, George H., Plattsburg, N. Y.
Slab of Chazy limestone, Valcour island, Lake Champlain, N. Y.
Trilobite from Crab island, Lake Champlain, N. Y.
Dike specimen from Martins bay, Plattsburg, N. Y.
Specimen of Potsdam sandstone from Salmon river, above Schuyler Falls, N. Y.
Specimen of Potsdam sandstone, Keeseville, N. Y.
Collection of 10,000 specimens of insects, Plattsburg, N. Y.
Jones, Abbie, Stone Ridge, N. Y.
10 quartz crystals
Jordan, Charles, Rensselaer, N. Y.
Marsh Hawk, Rensselaer, N. Y.

Keller, G. Edwin, Buffalo, N. Y.
19 specimens of plants from western New York
Kittridge, Miss E. M., Ferrisburg, Vt.
25 specimens of plants from New York and Vermont
Latham, Roy, Orient, N. Y.
Duplicate collection of beetles for identification
186 specimens of beetles
135 specimens of plants from eastern Long Island
Levine, Max, Schenectady, N. Y.
Specimens of oriental cockroach, Schenectady, N. Y.
Lewis, C. W., East Greenbush, N. Y.
Specimens of "fish moth," East Greenbush, N. Y.
Lutman, Harriet E., Painted Post, N. Y., collected by Mrs Harriet Louise Lutman, Painted Post, N. Y.
Collection of historical and geological objects
Mager, C. E., New York City
Specimens of Japanese beetle, New York City
Mang, William N., Niagara Falls, N. Y.
Specimens of black carpet beetle, Niagara Falls, N. Y.
Marshall, David T., Hollis, N. Y.
Specimens of Japanese beetle, Hollis, N. Y.
Meeker, Mrs L. R., Albany, N. Y.
Specimens of the vine anomola, Albany, N. Y.
Miller, E. S., Wading River, N. Y.
Specimens of the black carpet beetle, Wading River, N. Y.
Mischler, Walter, Schenectady, N. Y.
Specimens of elm leaf beetle, Schenectady, N. Y.
Moseley, E. L., Bowling Green, Ohio
50 plants from Ohio
Murray, Thomas, Tuxedo, N. Y.
Specimens of clover root curculio, Tuxedo, N. Y.
Myers, L. H., Selkirk, N. Y.
Specimens of the common stalk borer, Selkirk, N. Y.
Patterson, Grace A. E., Brooklyn, N. Y.
Specimens of the hemispherical scale, Albany, N. Y.
Perkins, Dr Anne E., Gowanda, N. Y.
217 specimens of plants from western New York
Petry, L. C., Ithaca, N. Y.
2 fossil plants, Bristol Center, N. Y.
Pickett, C. H., Gansevoort, N. Y.
Luna moth, Gansevoort, N. Y.
Price, Allen L., Sloatsburg, N. Y.
Clover root curculio, Sloatsburg, N. Y.
Ratchelous, William, Hempstead, N. Y.
Specimens of May beetle, Hempstead, N. Y.
Richardson, C. H., Syracuse, N. Y.
36 graptolites, Castle Brook, Magog, P. Q., Canada
Roberts, F. O., Troy, N. Y.
Specimens of work of codling moth, plum curculio, apple curculio, leaf roller and apple bud moth, Troy, N. Y.
Rockwell, Ella, Utica, N. Y.
Larvae of elm leaf beetle, Utica, N. Y.
Rogers, James, Gloversville, N. Y.
Specimens of black carpet beetle, Gloversville, N. Y.
Scott, R. S., Rochester, N. Y.
Galls on goldenrod, Rochester, N. Y.
Shear, Dr C. L., Washington, D. C.
Specimen of *Keithia tsugae*, Alcove, N. Y.
Sheldon Slate Company, F. C., Granville, N. Y.
9 specimens of roofing slate, Granville, N. Y.
Sherwood, W. W., Port Henry, N. Y.
Galls of the hickory gall aphid, Batavia, N. Y.
Slack, C. M., Fort Edward, N. Y.
Luna moth, Fort Edward, N. Y.

Smith, Silas W., Glens Falls, N. Y.
50 agricultural implements, tools, household objects and old almanacs
Soule, M. A., Quaker Street, N. Y.
Specimens of elm leaf miner, Quaker Street, N. Y.
Swift, Marjorie E., Bronx Park, N. Y.
Specimens of an iris weevil, Bronx Park, N. Y.
VanBenthuysen, Charles F., Albany, N. Y.
Brass alidade
Vanderzee, Henry C., South Bethlehem, N. Y.
Lever for passenger "stool pigeon"
Marie-Victorin, Prof., Montreal, Canada
73 specimens of plants from Canada
Wade, Edith S., Cohoes, N. Y.
Grain moths, Cohoes, N. Y.
Westfall, Rev. L. J., Baltimore, Md.
Specimen of stalagmite, Shutters Corners, N. Y.
Wilcox, William H., Lake George, N. Y.
Bouquet of human hair
Pair of German silver spectacles
Williams, K. F., Albany, N. Y.
Specimens of predacious living beetles, Albany, N. Y.
Wynkoop, John, Voorheesville, N. Y.
Specimens of blister beetle, Voorheesville, N. Y.
Zalsman, Mrs Ruth, New Haven, N. Y.
Larva of a fly, New Haven, N. Y.
Zenkert, Charles A., Buffalo, N. Y.
116 plants from western New York
Zimmer, C. H., New York City
Specimens of Japanese beetles, White Plains, N. Y.

### BY EXCHANGE

Amherst College, through F. B. Loomis, Amherst, Mass.
3 slabs of Triassic sandstone, Turner's Falls, Mass.

### BY PURCHASE

Batchelder, George, Gansevoort, N. Y.
Dreikanter boulder, Wilton, N. Y.
Reinhard, E., Buffalo, N. Y.
Fossil, northern Buffalo, N. Y.
6 fossils, Gasport, N. Y.

### BY MUSEUM STAFF

Adams, Charles C., Albany, N. Y.
Borer injury to elder, Albany, N. Y.
Borer injury to poplar, Albany, N. Y.
Box of hand-made iron nails from Niskayuna Shaker Settlement, Albany, N. Y.
Miscellaneous group of hand-made iron articles from Niskayuna Shaker Settlement, Albany, N. Y.
Adams, Charles C., and Glasgow, R. D., Albany, N. Y.
Workers and nests of paper-making wasps, South Berne, N. Y.
Chamberlain, K. F., Albany, N. Y.
Mortar and pestle, Monmouth, Maine.
Glasgow, R. D., Albany, N. Y.
Termites and work, Colonie, N. Y.
Specimens of juniper mite and its work, Millbrook, N. Y., and Tuxedo Park, N. Y.
Specimens of juniper webworm and its work, Millbrook, N. Y.
Specimens of arbor vitae leaf miner and its work, Millbrook, N. Y., and Garrison, N. Y.
Specimens of balsam leaf galls, North Elba, N. Y.
Specimens of spruce cone galls, Albany, N. Y. and Millbrook, N. Y.
Specimens of stice spruce galls, Millbrook, N. Y.

Specimens of eelworm injury, Islip, N. Y.
Adults, nymphs and work of thrips, New Rochelle, N. Y.
Galls on goldenrod, John Boyd Thacher Park, Albany county, N. Y.

Glasgow, R. D., and Chamberlain, K. F., Albany, N. Y.
Twigs damaged by egg punctures of the periodical cicada, Palenville, N. Y.
Larvae of European corn borer, Scotia, N. Y.
Larvae of smartweed borer, Scotia, N. Y.
Termites and work, Colonie, N. Y.
Photographs of termite work, Colonie, N. Y.
Photographs of termite habitats, Colonie, N. Y.

Glasgow, R. D., and Clement, R. L., Albany, N. Y.
Larvae, puparia and adults of the lesser bulb fly, Babylon, N. Y.
Larvae, adults and work of the narcissus bulb fly, Babylon, N. Y.

Glasgow, R. D., and Stein, E. J., Albany, N. Y.
Photographs of sites of experimental colonies of the periodical cicada, Greene County, N. Y.
Photographs of termite injury, Colonie, N. Y.

Goldring, Winifred, Albany, N. Y.
20 Devonian plants, Gilboa, N. Y.

Goldring, Winifred, Kilfoyle, C., and Schoonmaker, W. J., Albany, N. Y.
51 Devonian plants, Gilboa, N. Y.

Hartnagel, C. A., Albany, N. Y.
Specimen of stalagmite, Shutters Corners, N. Y.

Newland, D. H., Albany, N. Y.
Granite specimens, White Lake, N. Y.
Suite of gypsum specimens, Victor, N. Y.

Newland, D. H., and Hartnagel, C. A., Albany, N. Y.
10 specimens of anorthosite, west of Keeseville, N. Y.
5 specimens of hexagonite from talc mines, near Talcville, N. Y.
12 specimens of malachite, at Cole pyrite mine, near Gouverneur, N. Y.
6 specimens of talc from mines of St Lawrence county talc district
10 specimens of zinc ores from mine at Edwards, N. Y.

Ploger, L. W., and Phinney, W. W., Syracuse, N. Y.
Fossil tree, North Evans, N. Y.

Ruedemann, Rudolph, Albany, N. Y.
*Oldhamia occidens,* Nassau, N. Y.
Fragment of Washington elm, Cambridge, Mass.

Schoonmaker, Walter J., Albany, N. Y.
Collection of mammals from eastern New York

Schoonmaker, W. J., and Kilfoyle, C., Albany, N. Y.
8 fossils, Bemis Heights, N. Y.

### BY TRANSFER

Conservation Commission, Albany, N. Y., through Dr Emmeline Moore
Large collection of fish from the waters of Erie-Niagara watershed

Division of Archives and History, Department of Education, through Dr A. C. Flick, State Historian, Albany, N. Y.
48 old almanacs, Argyle, N. Y.

State Education Department, through Dr Frank P. Graves, Commissioner
Diploma of grand prize awarded the University of the State of New York by the Panama-Pacific International Exposition, 1915

### TRANSFERS TO OTHER INSTITUTIONS

New York State Agricultural Society, Syracuse, N. Y., through resolution of the State Board of Regents (for exhibition at the State Fair)
11 old-type agricultural implements
23 framed photographs of past presidents of the New York State Agricultural Society
11 paintings of farm animals and farm scenes

### LOAN TO MUSEUM

Sanderson, W. E., Albany, N. Y.
Wooden boot jack

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1929*a* The Importance of Preserving Wilderness Conditions. N. Y. State Mus. Bul., 279:37–46

**Brigham, Albert P.**

1929 Glacial Geology and Geographic Conditions of the Lower Mohawk Valley. A Survey of the Amsterdam, Fonda, Gloversville and Broadalbin Quadrangles. N. Y. State Mus. Bul., 280:1–133

**Chamberlain, K. F.**

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**Clarke, Noah T.**

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**Fraleigh, Lucy B.**

1929 The Habits of Mammals at an Adirondack Camp. N. Y. State Mus. Hdbk, 8:119–69

**Harper, Francis**

1929 Notes on Mammal of the Adirondacks. N. Y. State Mus. Hdbk, 8:51–118

**Harper, Francis, & Harper, Jean S.**

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**Hartnagel, C. A.**

1928 Stark's Knob. Rocks and Minerals, 3:84–85

**Nevin, Charles M.**

1928 The Sand and Gravel Resources of New York State. N. Y. State Mus. Bul., 282:1–180

**Newland, David H.**

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1929*a* Review of Progress in Geology. The New International Encyclopedia, Supplement and Year Book, p. 287–90

1929*b* The Early History of Mining in Northern and Central New York. Up-Stater, 1, no. 3:9, 15, 18, with cuts

**Ruedemann, Rudolph**

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1929*a* Note on *Oldhamia (Murchisonites) occidens* (Walcott). N. Y. State Mus. Bul., 281:47–50

**Ruedemann, Rudolph, & Goldring, Winifred**

1928 Making Fossils Popular in New York State Museum. N. Y. State Mus. Bul., 279:47–51

**Saunders, Aretas A.**

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**Schoonmaker, W. J.**

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1929*c* "Bobby." Story of the Red Squirrel. National Humane Review, 17:8
1929*d* The Raccoon Family. National Humane Review, 17:6–8
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**Slater, George**
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FIGURE 2 Group of pupils from the Hooper School, Endwell, N. Y., visiting the State Museum, under the direction of E. W. Neff

FIGURE 3 The Endwell school children assembled about the state relief map in the State Museum


FIGURE 4 Bronze statue of Joseph Henry, in front of the Albany Academy, where he attended, taught and made important discoveries in electro-magnetism. Sculptor John Flanagan

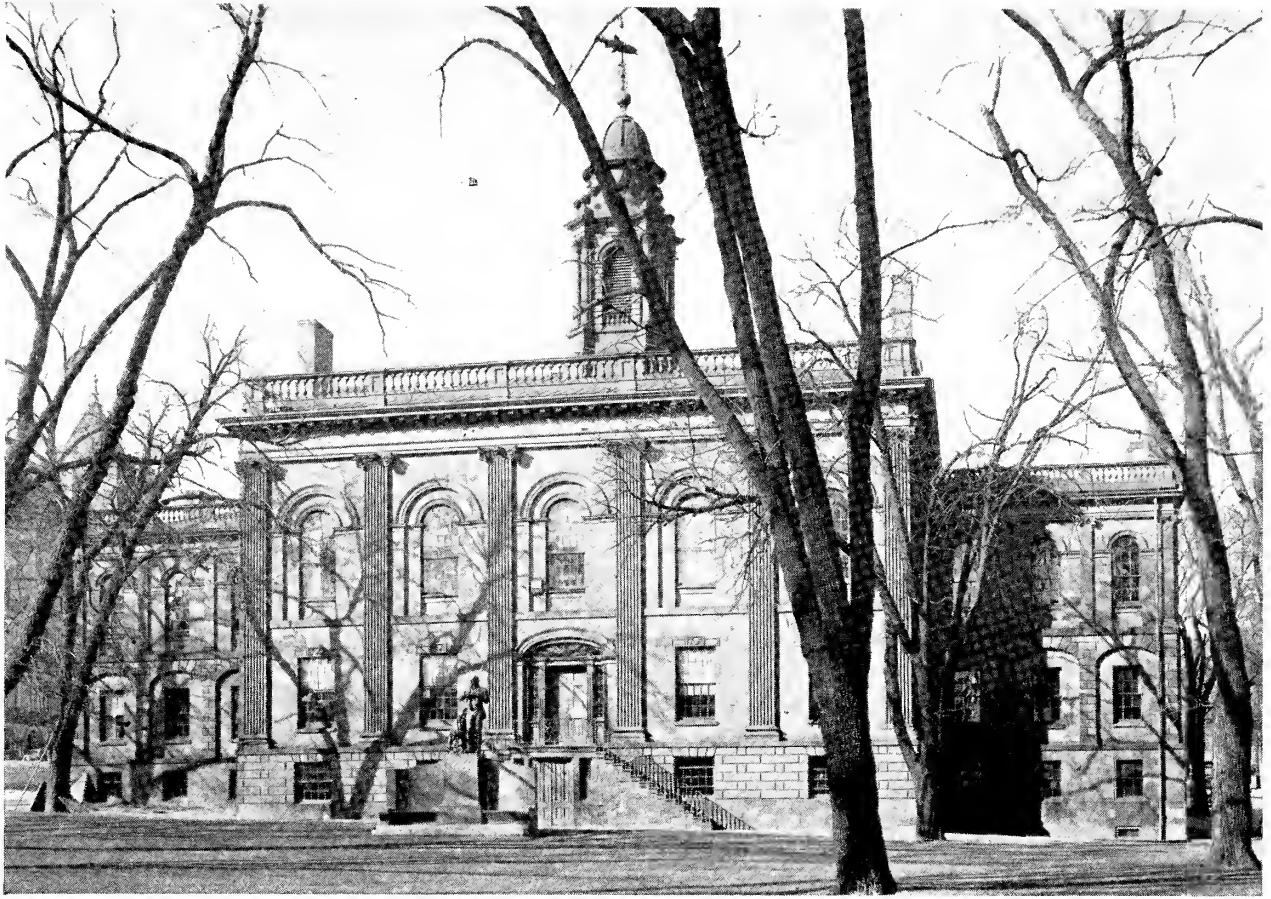

FIGURE 5 Albany Academy, Albany, N. Y., showing the setting of the Joseph Henry statue. The room on the second floor behind the statue was the place of his important discoveries.


FIGURE 6 The Ainsworth gold medal. Presented by Dr James Hall to the legislative supporters of his geological and paleontological studies.

FIGURE 7 The herb factory or warehouse of the Niskayuna Shakers, near Albany, N. Y. In this building was found an herb collection and many of the tools used in their preparation.

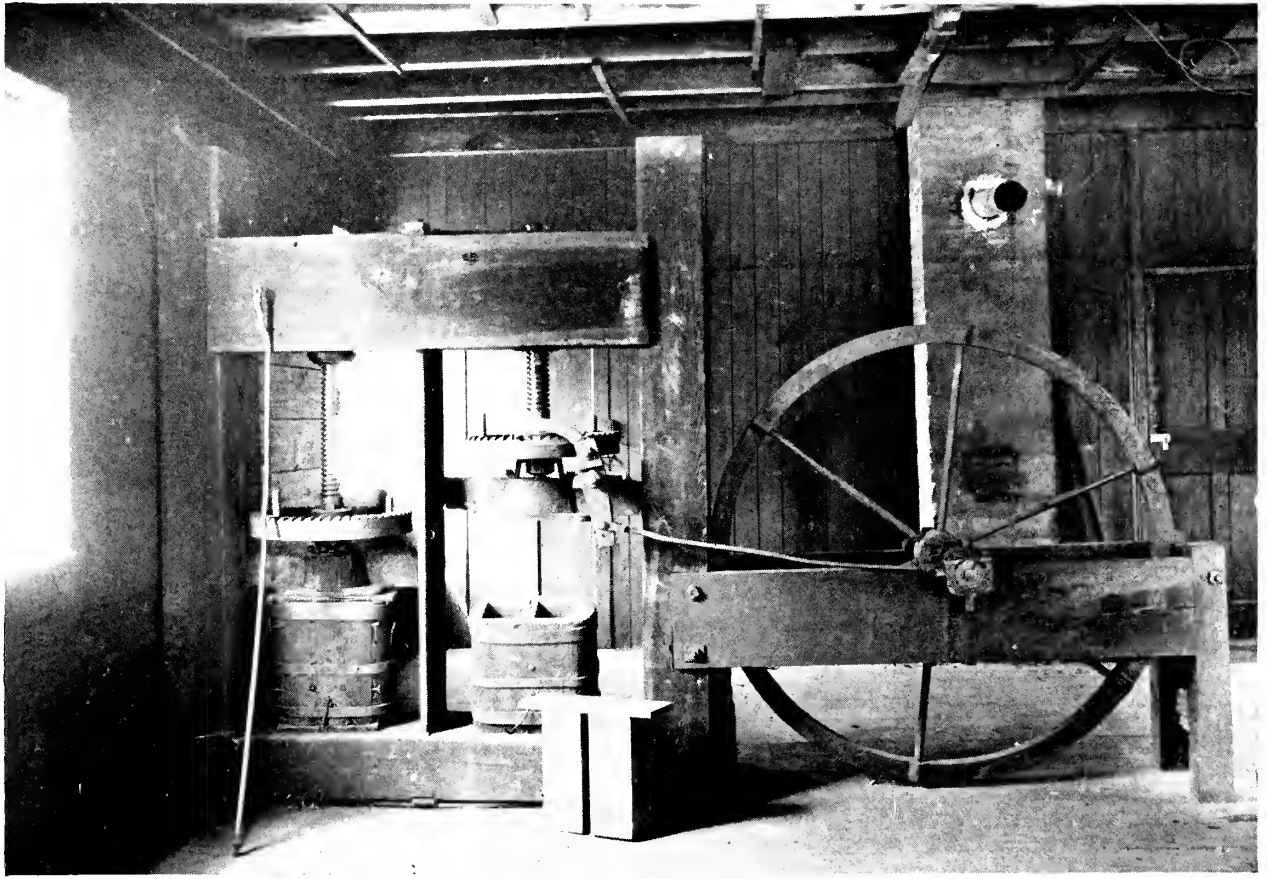

FIGURE 8 Shaker herb press used for compressing herbs; Niskayuna Shakers, near Albany, N. Y.

FIGURE 9 The herb room in the warehouse shown in figure 8, Niskayuna Shakers, near Albany, N. Y.

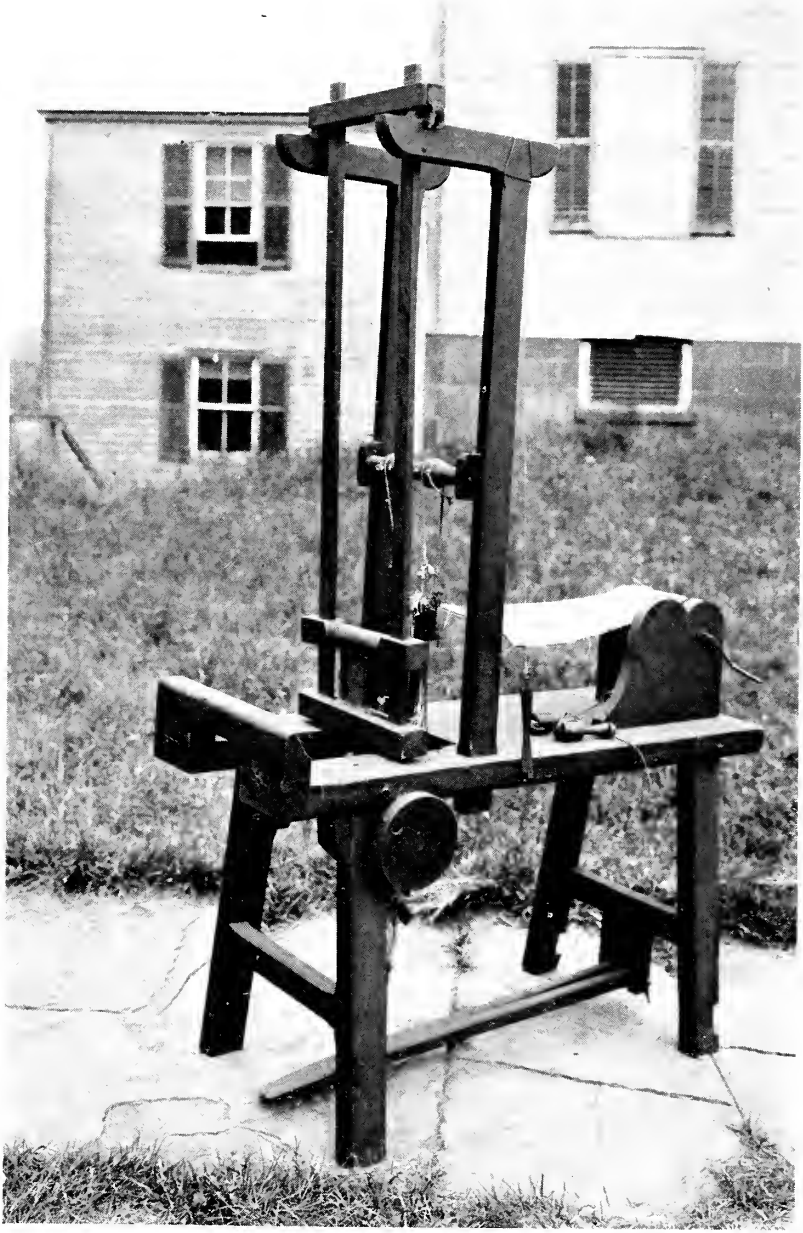

FIGURE 10 A small loom used by the Niskayuna Shakers, near Albany, N. Y.

# THE IMPORTANCE OF ESTABLISHING NATURAL HISTORY RESERVATIONS FOR RESEARCH AND EDUCATION

By Charles C. Adams Ph.D.

*Director, New York State Museum and Member of State Council of Parks*

"There must be ample research in the laboratory in order even to present those problems, not to speak of solving them, and there can be no laboratory study without the accumulation of masses of dry facts and specimens.

"I also mean that from now on it is essential to recognize that the best scientific men must largely work in the great out-of-doors laboratory of nature. It is only such out-of-door work which will give us the chance to interpret aright the laboratory observations."—Theodore Roosevelt's address at the opening of the New York State Museum, December 29, 1916.

## URGENCY OF IMMEDIATE ACTION

Although New York State has today thousands of acres of virgin wilderness, it is possible that as economic pressure increases the State Constitution may be changed to permit the cutting and destruction at least, in part, of these wild forest lands. Then the natural history of the region will also be changed. Industrial, urban and agricultural changes are making inroads on these wild areas. Today there is no adequate provision in this State for the preservation of samples of these natural history wilderness conditions for future generations. These wilderness conditions were where our American pioneers first developed their distinctive American traits. We ought to preserve good samples of these conditions. If this is done the time will come when these will be considered priceless possessions. We should, without delay, make adequate provision for such wilderness preserves. There is a beauty and charm found in wild forests, not possessed by others. Such forests deserve preservation for their inspirational value and for their educational and research importance.

We have already destroyed a vast amount of the wilderness before it was studied from an educational and scientific point of view. We need now to have reservations where such studies can be conducted on some permanent sustained policy. We have no such reservations adequately endowed in America. This is today a paramount scientific and educational need. The studies to be made on such a reservation should give primary attention to the broad, outdoor aspects of natural history.

The state forests and state parks are concerned primarily and legitimately with economic and intensive recreational use, with the result that virgin conditions are not preserved. We need some satisfactory provision to perpetuate areas where nature has a chance to run her course, unhindered as much as possible by man.

Such land should include the best possible samples of virgin forests, swamps and natural ponds and lakes, so as to secure as great a variety of natural conditions as possible. Since no single reservation can preserve all the variety needed in New York State, a system of preserves is needed, carefully selected with a view to their protection and facilities for scientific study.

A given unit area should include several thousands of acres and should have an endowed income that will provide for its maintenance and a staff of naturalists to conduct their studies of the area.

Facilities for the laboratory study of nature have made more progress during the past 50 years than during several centuries previously. The modern educational world and the leaders in certain industries have made great advances in the appreciation of and practical support for such laboratories. The extension of laboratory methods into the field has also made great progress in agriculture through experiment stations. In the biological sciences the establishment of marine and fresh water biological stations, for both teaching and research, has greatly extended the amplitude of this field. Some of these biological research stations are conducted along lines closely parallel to the agricultural experiment stations, but generally speaking the outdoor world at these marine stations is used for collecting rather than for detailed observation and experimentation. The innumerable encroachments of agriculture, forestry, manufacturing and towns upon wild or wilderness areas are so rapid that almost before we are aware of it suitable areas for observation and experiment have been destroyed and are forever lost before they have been studied.

One might expect that the preservation of representative sample areas of virgin forests would find many friends among the leaders in forestry, because of the extreme importance of such samples in the study of economic and scientific forest development, but this has not been the case. A few of the more far-seeing foresters grasped this, but they received little support among their colleagues, until competition with the national parks for the wilderness lands made it to their direct advantage to urge that virgin and wild areas be sought for additional parks. This motive was supplemented, to

some degree no doubt, by the growing realization of the backwardness of forest research. This policy was followed by much publicity for the setting aside of wilderness areas and virgin reservations, but to what degree this policy will resist pressure from economic and other interests—lumbering, grazing and hunting—remains to be seen.

For several years it seemed that safe havens for natural wilderness conditions were to be found in the national parks and monuments, as that was the proclaimed policy of the park service. In the effort to gain public support for these parks, however, and to resist the aggression of the United States Forest Service, who competed for these wild lands, a period of publicity was inaugurated with the consequent rush of people into these parks before adequate funds, staff and leadership were supplied to protect them. Serious injury of certain areas resulted. This was caused by the expansion of roads and the utilization of the timber for construction, the use of forage for grazing animals and similar uses, not in harmony with the professed policy of passing our national parks on to future generations unimpaired.

These and many other indications show that even our national policy of preserving for the future nature's wonders unharmed is a very difficult problem. We have clearly made more progress in the preservation of natural scenery, dependent on physical nature, rather than on the preservation of the forests and their animal denizens. The educational, scientific, esthetic and historic value of such reservations have been stressed by several authors (Shelford and others '26; Hall '29).

## A SUPPLEMENTARY STATE POLICY

When we turn to the corresponding problem in the various states we find that no state in the Union has yet adopted a definite policy for the presevation of natural wild nature for historic, educational, scenic or scientific purposes. To gain public financial support for such reservations not to be used intensively by large crowds of people, is the practical problem that awaits solution. Proposals have been made for a policy for the scientific and historic reservations, owned and maintained by New York State, (Adams '29; Flick '29), and the present proposal is supplementary to this (cf. Dice '26). Following this paper is printed the formulated principles

adopted by the New York State Council of Parks for guidance. The reservations here advocated are supplementary to such a system.

The very widespread and popular movement for state parks throughout the United States has not made much progress in helping the preservation of virgin wilderness conditions. Under the leadership of Jens Jensen, and the Friends of the Native Landscape, a program has been proposed for state parks in Illinois involving this ideal, but actual parks of the kinds desired have been slow in developing. Dr John M. Clarke, the former Director of the New York State Museum at Albany, made the first start on a series of state scientific reservations, intended primarily for the preservation of sites of special geological interest, and adopting the national park ideal, but there were not sufficient funds to protect or to study the plants and animals of these reservations. Later these reservations were diverted into the state park system, where the plants and animals suffered from the intensive use of these areas for recreation (cf. Adams '29:19–23; 37–46; '29b).

The prospects for increasing the number of these reservations and providing for their care from public funds look so unfavorable that rather than allow these areas to become injured or ruined while waiting for a lagging public sentiment and support, it seems best to urge the establishment of such reservations in trust, putting them in the hands of responsible semipublic or public officials, who should be authorized to administer them with the aid of interested and competent naturalists. The funds or endowment might either be held in trust by some bank, or be invested by the officials themselves, the income to be used exclusively for the maintenance of the reservations and for a staff to conduct scientific research on and to protect such reservations. To secure the best results there should be both conservative and scientific work done on such reservations, instead of devoting attention solely to the protective or conservative phase. The general public should be allowed only such use of these reservations as experience would justify, and always under strict supervision by competent leaders or guides. To be sure, in addition to the form of limited use by the public, there would be derived from such reservations published popular and scientific reports and bulletins resulting from the studies by the scientific staff.

## METHODS OF SELECTING RESERVATION AREAS

Anyone contemplating the establishment of such a reservation should consult competent naturalists and have a careful survey made of the proposed area. Some of the outstanding characteristics of such areas should be:

1 The region should be as near a *natural virgin wilderness* as is possible to secure, with natural physical features, plants and animals worthy of special care and study. Insistence upon *virgin areas* can not be too strong, and is absolutely essential for certain reservations.

2 The area should be large enough to make a practical administrative unit.

3 It should be physically diverse, with lakes, ponds, swamps, brooks and creeks, to provide a variety of physical conditions or habitats for a variety of plants and animals. The more diversified the area, the greater its interest and the greater the number of problems that can be studied from a single base through a period of years.

4 Outstanding and unusual or striking physical features, geological outcrops of special importance, and even certain scenic features might well be included in such reservations to give them distinctive merit. There is an advantage in combining geological or other physical features with those of biological significance, in order to concentrate interest and support.

5 The possibility of the *permanence* of the site should be given very careful attention. Sites should not be selected, when avoidable, which are likely to become injured by drainage projects, highways, industrial plants or encroaching settlements.

## KIND OF STUDIES WHICH COULD BE CONDUCTED ON SUCH RESERVATIONS

In addition to the protective aspects of such a reservation special attention should be given to such studies as the following:

1 Prolonged studies should be made by resident naturalists of the life history and habits of the plants and animals of the region under natural conditions. The facilities for such work are deplorably few or lacking in our general educational system.

2 In the more densely settled regions, where natural conditions have been largely destroyed, reservations are needed with the definite policy of *restoration of conditions* as nearly as possible approach-

ing those of a virgin wilderness. A scientific study of this restoration problem is urgently needed and could best be done on such a reservation.

The paper following, by the New York State Council of Parks. on the criterions which should be used in the selection of parks, brings out clearly the standards toward which the State Parks are at present tending, and contrasts them with reservations, which are emphasized in this paper.

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## ADDENDUM

### PRINCIPLES GOVERNING THE ESTABLISHMENT OF NEW YORK STATE PARKS

The State is committed to the development of a unified park system developed on a regional basis. There are ten park regions including the forest preserve region. These park specifications apply to all regions except the forest preserve, the development of which is governed by totally different considerations. The state program for each region is based primarily upon scenic attraction and recreational needs. An even geographical distribution of "a park every 50 miles" or "a park for every county" is manifestly impossible on account of scenic, recreational and other requirements, and because it is fundamentally unscientific.

A park site should possess both conspicuous scenic and recreational value, or at least some scenic value and very unusual recreational possibilities.

By conspicuous scenic value is meant rare natural scenery which is unlikely to be preserved for enjoyment by the public of this and future generations if the property remains in private hands, and which is sufficiently distinctive to attract and interest people from distant parts of the State as well as local people.

By conspicuous recreational value is meant topography, trees, vegetation, streams, lakes or ocean shore, which will attract and interest people of a wide surrounding area and which would not be available to the public if the property remained in private hands.

In the absence of striking scenic value, this may be compensated for by very unusual recreational value such as is represented by a very fine bathing beach or by an exceptional location with respect to population centers and main arteries of travel.

The State Parks should be sufficient in number to meet the prospective demands of the people of each region over and above facilities which are or should be provided by local, city, county, town and village parks, and without requiring a state park budget which is unreasonable or excessive in the light of other financial demands.

*Minimum area.* Except in extraordinary cases the site should include not less than 400 acres of land well adapted for park use and development. Existing parks of smaller area should be extended to at least this minimum acreage.

*Group of smaller units.* In certain special cases, a group of smaller units may be desirable when the several sites are close

enough together for a central management and it is not practical to acquire the land between units. This situation is illustrated by the several sites comprising the Niagara Reservation. Even here the ultimate objective should contemplate the connection of these units by a parkway or wide boulevard under park management. Small units along a state parkway for parking or picnicking are always desirable.

*Nearness to cities and large villages.* The site generally should be well beyond the limits of cities or large villages. A state park should be "out in the country," attractive to tourists and to the people of the State in general, or should serve a great metropolitan area.

*The large park compared to smaller parks.* It is better to concentrate on one large fine park than to scatter efforts over a number of smaller parks in the same neighborhood.

*Requirements for new parks to be increasingly strict.* The establishment of new parks must not be carried to an extent which will interfere with the proper development of existing parks. For this reason the requirements for new park sites must become increasingly strict. A state park should be developed in a dignified and substantial manner and park funds should not be scattered over so many sites as to result in partial or improper development.

*Historic and scientific features.* The value of a state park site is enhanced if it contains historical and scientific features which are interesting and educational, but such factors are incidental and not controlling like scenic and recreational requirements.

Sites which are primarily historical and scientific should not be administered by the park authorities which lack the interest and knowledge to care for them. No new sites of this kind should be acquired, and those now in existence should be transferred to the Education Department as soon as the Legislature can make provision for a Bureau of Historic and Scientific Places in that department.

*Type of land to be taken.* In general, the policy is not to take unattractive, open farm lands for park purposes, but to utilize property which can not be farmed economically. However, this should not be construed to prevent taking necessary open land to provide entrances, parking areas, recreational fields, etc., as adjuncts to the main park area.

*Woods and water.* A site possessing a fair percentage of wooded area is to be preferred. A stream, lake or ocean shore with water

of sufficient purity for bathing is practically indispensable. Parks without bathing facilities or the possibility of such facilities, or without water views are not desirable.

*Cost of land.* The cost of land should be relatively low considering the section of the State in which the park site is located. Other things being equal, a site involving a small number of present owners is to be preferred.

*Cost of development.* The park site must eventually have entrance and other roads, drinking water, sanitary facilities, central building, clearing of grounds, etc. A site which necessitates unusually large expenditures to provide for basic developments should be avoided.

Adopted April 22, 1930

State Council of Parks.

ROBERT MOSES
*Chairman*

HENRY F. LUTZ
*Secretary*

Approved, May 1, 1930

ALEXANDER MACDONALD
*Conservation Commissioner*

# THE PUBLIC FUNCTIONS OF THE DIVISION OF SCIENCE AND STATE MUSEUM

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## THE GENERAL BACKGROUND

The modern civilized world has been remade almost completely during the past few generations. The leading factor in this change is the progress of science and invention as applied to modern life.

In the old days governments, like most people, lived from hand to mouth and seldom planned for the future. As H. G. Wells has said, the discovery of the future is a very modern experience. States and nations today have begun to realize that they should not merely look forward but should formulate policies just as should a wisely conducted business enterprise. Modern government is a huge undertaking and should adopt some of the methods and technic already perfected in other fields of activity.

The emphasis put on science in recent years in relation to industrial development is so well known as to become a commonplace remark. The fundamental fact is that the slow perfection of the scientific method, as worked out in the physical and natural history sciences, is now being consciously extended to those natural history sciences which center about man and which have come to be called the humanities. The application of the same methods of careful, scientific analysis and synthesis is today the primary scientific and practical problem of human society.

In the early days our federal leadership was fortunate in having such friends of science as Franklin and Jefferson, and it is no accident that we find today clustered about the Federal Government a whole series of scientific bureaus. There are the Smithsonian Institution, the United States National Museum, the United States Geological Survey, the Bureau of Fisheries, the Bureau of Standards, the Bureau of Mines, and in the United States Department of Agriculture are hundreds of meteorologists, chemists, botanists, foresters, zoologists and entomologists. It is very evident that the natural history sciences are at hand with facilities for securing facts. Some of these agencies are fairly well supplied with funds and others are not, but they show that the Federal Government has clearly recognized the necessity of these fact-finding staffs, and

such repositories of facts and objects as the National Museum, Smithsonian Institution, Freer Art Gallery and the Congressional Library are realities and not merely remote dreams. This efficient federal organization has been built gradually, and perhaps without fully realizing how much has been accomplished.

Before passing from the Federal Government, I wish to point out that even here it is *constructive policies* which are probably the most neglected aspect in the federal scheme. Too often these comprehensive programs have been made only for military preparedness rather than for the broadest public economic and social welfare.

Turning now to the various states, we find that they tend to follow the federal example, although the states have preceded the Federal Government in certain matters. Thus the system of making an inventory of natural resources, which we are accustomed to call the geological and natural history surveys, started with the states before the Federal Government undertook such work systematically, rather than by sporadic exploring expeditions. Most states, however, have lagged far behind the Federal Government in the completeness of their scientific, historical and art bureaus. Not all of the states have geological and natural history surveys, or a state museum, and there are also many inadequate state libraries and historical and art museums. This backwardness has perhaps in some cases been due to dependence on the federal bureaus as a substitute for some of their own activity. The older history of New York is very creditable, because this State began its geological and natural history survey far in advance of most other states, and it is only during these later years that, relatively speaking, she has fallen behind. The great economic expansion of recent years has not been met by a corresponding support of the scientific organizations, libraries, natural history and art museums.

## CONDITIONS IN NEW YORK STATE

With the reorganization of the State Government in 1927 all educational and research organizations were concentrated in the State Education Department. This Department, therefore, in addition to its administrative or law enforcement functions, has general charge of the state educational and research organizations. Within the Education Building are located the State Library, the State Museum and the Division of Archives and History. The activities of these three organizations are in marked contrast with the other

divisions located in this same building. They are not primarily administrative bureaus, but are devoted to the accumulation and utilization of books, documents and objects of science, history and art, and lastly, and of *equal importance, they are devoted to scientific and scholarly research,* not merely on these accumulated materials and work in their laboratories, but as well on statewide field work in their respective fields. At present there is active and hearty cooperation between these three groups.

A primary motive for the consolidation of the State Government was to avoid undesirable duplication, to secure closer cooperation and an economy of effort and finance. Research by state institutions outside of Albany is centered at Ithaca, Geneva and Syracuse, so far as agriculture and forestry are concerned. These state agencies within the Education Department, are the State College of Agriculture, the Geneva Agricultural Experiment Station and the State College of Forestry. The correlation and cooperation of these within the Department are thus an internal problem.

The state departments with which the Division of Science and State Museum is most closely related are the following:

1 **The Department of Law.** Most of the cooperation with the Attorney General's office has been regarding litigation over or the purchase of land by the State. As you well know, the State has become the owner of millions of acres of land, including dry land, that under fresh and salt water. The land acquisition policy for forests, parks and other purposes has demanded consideration of their mineral resources. For 90 years the State has had in its employ very competent geologists who have furnished their assistance to the State. The Attorney General's office and the Judiciary Department of the State Government have taken advantage of these scientists and their technical knowledge. During the past year a dozen cases involving mineral rights have received the attention of our geologists. This involves weeks of work in the field, office, laboratory and in the courts. This kind of work attracts little attention, often has antagonized powerful interests, and has been of little advantage to the Museum, but no fair-minded person will belittle such public service.

2 **Department of Agriculture and Markets.** This department in its administrative functions is constantly meeting with new problems that demand scientific study, such as that of the corn borer, the Japanese beetle and the narcissus bulb insect pests. I am pleased to report that hearty cooperative relations already exist between the Museum and this department, and the results have been mutually

advantageous. Certain of these problems can best be handled at Albany, and others at Ithaca and Geneva. All these agencies are needed and should be intelligently coordinated.

3 **The Department of Conservation.** At present the main point of contact has been that the Director of the State Museum is a member of the State Council of Parks, in the Department of Conservation. This council has general supervision of the state parks and the state scientific and historic reservations. This relation is the outgrowth of the transfer of the State Museum's reservations, which formerly had been secured by the State Museum, and which, with reorganization of the State Government, were transferred to the Department of Conservation (Clark Reservation, Chittenango Falls, Squaw Island, Stark's Knob and the Cryptozoon Ledge). Other points of contact, which have not been developed and which should be, concern *scientific* studies of various problems involving fish, game and fur-bearing animals, as well as forest, plant and insect pests, which infest state and private lands administered by the Department of Conservation. Other departments than the Education Department cannot maintain the library, collections, laboratories and scientific staff needed for such purposes, and there should be very close cooperation in such matters.

4 **Department of Public Works.** Very naturally the relation to the Department of Public Works has been mainly in connection with construction plans, such as foundations of bridges, dams and public buildings, as well as the state canal problems, and with highways regarding road materials. In recent years, with extensive highway construction, deposits of sand and gravel have increased greatly in importance. There has been hearty cooperation between the Museum and the Bureau of Highways. Such assistance is not limited to state departments but is extended to municipalities and other public agencies and to legislative commissions. I may also add that the Legislature has not always been aware that it had on the Museum staff experts who were the most competent men to advise on certain subjects, and have hired—at considerable expense—less informed and less experienced men.

## THE FUNCTIONS OF THE DIVISION OF SCIENCE AND STATE MUSEUM

The preceding discussion outlines in general terms the relation of this Division of Science and State Museum to the Education Department and to other state departments. These functions may be considered to advantage from the following points of view:

1 **Its fact-finding or research functions.** To conduct the state scientific surveys of the natural resources is a large undertaking. The rocks, minerals, fossils, plants, animals and the study of special scientific and economic problems, such as relate to sand and gravel, limestones, injurious plants, insects and other animals, constitute an unending succession of field and laboratory studies urgently demanding attention. Our work should not be limited to the preliminary or "survey" aspects alone of these problems, but should extend to thorough investigations leading to and bearing directly on broad public policies. There should be some agency that will be primarily concerned with the *State's interest as a whole,* and not be limited too exclusively to the special, local or sectional interests. Administrative officers whose hands are already overflowing, and who have not the facilities for scientific work, can not be expected to conduct such research. It is work of this character which lies primarily within the field of the Division of Science and State Museum, as the central state scientific agency.

2 **Its reference collections.** During the conduct of all state surveys there has been an accumulation of field notes and specimens or objects. It was originally the accumulations of the early surveys that largely led to the Museum's collections. Such collections are essential equipment, as well as the product of these surveys.

At present we lack an adequate staff to conduct research on the historical objects, which have been and are being accumulated, but in time, no doubt, this defect will be remedied.

The value of these study or reference collections is difficult to impress upon the mind of even the educated public. Many see the value of a well-stocked library, so that one may, upon a moment's notice, secure information on almost any subject. But they do not realize that it requires very extensive collections of specimens or objects in order to have, on short notice, corresponding museum specimens or samples. This occasional use is only a secondary matter, because any careful study demands representative samples in quantity in order to reach sound conclusions in these sciences.

Very valuable private collections naturally drift into public museums, because they have a stable policy and have certain facilities to care for such materials. Then too, objects which are too bulky to find place in private homes, and which are expensive to store are gradually forced into public museums. In time such collections come to have unusual value. This is true of our own collections. We have much material that can not be duplicated. Today, unfor-

tunately, we are losing much valuable material because of an inadequate staff, storage and exhibition facilities.

3 **Museum exhibits.** Study or reference collections are one of the most important parts of a research museum, and are generally the basis for the *exhibits,* which the general public usually thinks constitute the real museum. We may roughly compare the relation of study collections and exhibits to the sunken part of the iceberg and the part above water. The largest part is submerged and a small part shows beautifully above the surface, as the exhibit, but there would be no "exhibit" were it not for the submerged portion. Just because of these degrees of visibility, it is difficult to secure public and other funds for these fundamental collections. Exhibits are primarily designed for educational purposes, and are a phase of applied science and art, combined so as to tell a story that the general public may readily understand.

The exhibits, because they are open to the public nearly 350 days a year, *are a permanent exposition of the resources of the State to residents and to tourists.* In spite of the fact that the State Museum is on the top floor of the Education Building, and with no sign on the outside of the building to indicate that it contains a public museum, we have about 200,000 visitors annually, and give to them free about $200,000 worth of recreational education.

4 **Publications.** In addition to the visitors to the Museum exhibits, a large, unmeasurable public is reached through the technical and popular Museum publications. These have an extensive distribution throughout the State in public libraries, and in exchange with other governmental agencies throughout the country and in foreign lands. *No one can get an adequate account of the natural resources of this State without consulting the publications of this Museum.* These cover about 40 lineal feet of shelving and constitute quite a library in themselves.

The colored plates of birds and wild flowers are in great demand and have an extensive sale throughout the Eastern States. The popular handbooks have met with a hearty response on the part of the public. The technical publications have for several generations been considered among the best in their class. We now have on hand a manuscript for two fine volumes, with colored plates, on the shells of the State, and other valuable technical papers are awaiting publication.

The State Museum should be the natural outlet for publications on the geological and natural history of the State. There is a field here for this public service.

## THE NEEDS OF THE DIVISION OF SCIENCE AND STATE MUSEUM

Time is available to mention only the outstanding needs of the Division and the Museum. A bird's-eye view of the situation is needed in order to get a proper perspective. The following may be mentioned:

1 A new Museum building
2 An increased scientific and technical staff
3 Professional research fellowships
4 Natural history reservations (in trust)
5 Financial support and trust funds

1 **A new Museum building.** For many years there has been an agitation for a new State Museum building. There are several reasons for this. The Education Department needs not only all the space in the Education Building but all on the present block, and none seems to be available in the new Office Building. The needs of the State Library and for offices are more than urgent, and demand all of this space. Another reason is that not only has the Museum outgrown its present quarters, but they were never properly planned for a museum. The system of skylights and their height, the lack of all storage space, wholly inadequate light in all the offices and laboratories, and the very imperfect system of ventilation indicate some of the major defects.

Lack of space prevents the Museum exhibits from giving a satisfactory picture of the resources, history and the industries of the State. The geological and fossil exhibits are the most complete; that of the plant world, including its ramifications in horticulture, agriculture, floriculture and forestry, is wholly inadequate. The relation of plant products to industry is not represented at all. Here is a wonderful field for the modern group exhibits which have great public interest. The animal exhibits have also lagged, and are not up to the latest standard. The field of anthropology is well represented by the justly famous Iroquois Indian groups, which are unsurpassed. The remainder of the Indian collection, though valuable and interesting, is not outstanding. Regarding the history and art of the white man, while we have very valuable collections in storage, we have only temporary exhibits, and this phase has an importance and interest which deserves much better attention. Our best historical collections are those related to the farm and household industries. If the history of the State could be portrayed by a series

of groups similar in quality to those of the Indian groups, as the former Director, Dr John M. Clarke, suggested, it would make this a very outstanding Museum. As to art, what little we have is almost negligible, and yet this State has and is producing representative work in many lines which should be exhibited here.

I have spoken of the exhibits first because of their popular appeal, but the storage rooms or Museum stacks, corresponding to the stacks of a library, are of paramount importance. With an abundance of storage space there will be room to care for a variety of materials which will enable the curators to change or rotate the exhibits and give them a freshness that is not a luxury in a museum but a necessity, if the place is kept really alive and not as a museum morgue.

Laboratories, work rooms and offices are a necessary element in a properly equipped modern museum. As a rule, these facilities are not given sufficient attention or space.

As to the site, everyone who has given any serious attention to the problem and who has a real knowledge of the requirements of such a building, recognizes that there is only one satisfactory site remaining and that is on State street *facing* the Education Building. The Legislative Commission in 1925 recommended for the State Museum the site now used by the new Office Building. Now the only remaining site is the one above named, facing the Education Building. The same commission submitted a drawing showing the type of building which it considered suitable for this Civic Center harmonizing with the Education Building and completing the civic center so well planned.

Such a building, facing on State street, should have wings extending backward to provide for each of the major divisions of work of the Museum and an administrative section. One wing, from basement to attic should be devoted to geology and the related physical sciences and industries; a second one to the plant world and its allied industries; a third central one to administration; a fourth to the animal world and the allied industries, and the fifth to history and anthropology, and including offices for the Division of Archives and History. This Division is not a part of the Museum but is so closely related that both should be under the same roof.

2 **An increased scientific and technical staff.** The staff of a scientific department or museum is its crew, and without a competent staff little can be expected. The staff has not grown during the past 17 years that it has occupied the Education Building, and certain valuable scientists and workmen have been lost. The salaries

have advanced only about 30 per cent and the cost of living has advanced 75 per cent during this period. The result is that its standard of work has been maintained for years by the staff rather than by the State, certainly an unsatisfactory condition, and below the standard for such a wealthy state. Our staff should be doubled within the next few years, and satisfactory provision should be made for several new positions, including professional men for the work in history and art and the various neglected industries.

3 **Professional research fellowships.** There is urgent need of facilities and supervision of scientific problems impinging upon public administrative and industrial difficulties, and in the various industries, that a central state agency, such as the Division of Science and State Museum, ought to be able to do much to meet. Thus, with sufficient office and laboratory space we could supervise a series of investigations in cooperation with industries. A very successful method of doing this is by professional research fellowships financed by the interested industries. Such a policy would be justified only, of course, provided that the subjects chosen were important and the results were made public, by means of appropriate publications. There are also field problems as well as those in the laboratory which can be handled by this method. As a concrete example, the clay industries of the Hudson valley might establish such fellowships in order to test certain properties of these clays and greatly increase their value. This same idea is applicable to other mineral resources, as gypsum, limestone and shale, and to a great variety of biological problems which need not be elaborated here.

4 **Natural history reservations (in trust).** There are a vast number of problems in science and industry, particularly in industry, that are essentially laboratory problems and must be solved by those methods. There are also others, especially those involving rural problems—those of the field, forest and waters—that depend for their solution primarily upon field research, supplemented, of course, by the laboratory. We hear very little about this phase of research, and it is one of the most neglected fields of scientific activity today. There are a number of possible solutions of this group of problems, but I wish to emphasize at this time only one of them. There is the need of a large tract of diversified wild land and waters which should be made a preserve where natural history studies may be carried on continuously by a resident scientific staff. Such a tract should be large enough to furnish a great variety of biological conditions, and should afford natural and experimental facilities that

will permit the conduct of varied studies of wild plants and wild animals under the most favorable conditions.

A sufficient endowment should be made available to furnish facilities for work and living conditions for an able staff, and on a scale large enough to produce important results.

Such a research station should be in trust in order to give it stability of policy, and endowed so as not to be at the mercy of fluctuating appropriations. A budget of from $50,000 or $100,000 a year would make a valuable unit for such a station.

5 **Financial support and trust funds.** The present budget for the work of the Division of Science and State Museum is less than $75,000. Within the next few years this should be at least $250,000. The city of Buffalo now contributes $149,000 to its local Museum, and New York City gives to the American Museum of Natural History, $434,000. This shows the backward condition of our finances.

In addition to the regular appropriations trust funds and gifts are needed to provide for special projects, and to furnish fluid funds in advance of the slowly moving public support necessary to secure appropriations. For years many opportunities to do valuable scientific work and to secure valuable historical collections have been lost because of the lack of such funds.

Without question the most successful scientific and educational organizations in the country are those which combine public funds with trust and gift funds. This lesson is so emphatic that no opportunity should be lost to indicate the importance of this kind of support.

# SOME MUSEUM METHODS DEVELOPED IN THE NEW YORK STATE MUSEUM

By Rudolf Ruedemann and Winifred Goldring

*Paleontologists, New York State Museum*

When the State Museum was moved in 1912 from its cramped quarters in the Geological Hall into the top floor of the Education Building, it found itself in possession of five times the floor space it had before and a general expansion of exhibits took place. This was especially the case in the departments of geology and paleontology, which took over the Main Hall, nearly 600 feet long.

As in the more than 80 years that the Geological Survey had been carried on large collections had been brought together from the State, among them over 10,000 types or originals of figures of fossils, there was no lack of material for exhibition, but the problem was how to make this unwieldy mass attractive and instructive to the visitor. We have in a former article (Ruedemann and Goldring '29) described the restorations that were undertaken for this purpose and the arrangement of the material to give it educational value. In the present article we shall set forth a number of minor methods that were developed in the process of installation and that serve to make the exhibits more attractive and instructive. We have not found these methods described in other publications on museum installation but have frequently been asked about them by visiting experts and therefore believe that their publication may be helpful to others who have to meet similar problems.

In putting the thousands of invertebrate fossils on exhibition, it was found of good advantage to select originals which had been figured and to place the figures alongside the specimens, because the figures add, so to say, a human element that attracts the eye first and leads to an inspection of the specimen.

In numerous cases the fossil was but a mold, from which a gutta-percha squeeze had been made that served as original for a figure. Usually the body of the fossil on the squeeze had been blackened with Chinese sepia or Indian ink to bring it out more sharply, a process that, however, only served to dull or hide the sculpture. An attempt to rub the blacking off with a wet finger, showed that thereby the finest details of sculpture became beautifully outlined in black on the red gutta percha. Numerous very attractive squeezes were thus obtained, especially among the crinoids, star-fishes and

crustaceans. The older the squeezes and the ink covering, the better the process will work.

Many fossils, as for example the trilobites of the Trenton and Hamilton formations, are made black and lustrous by a thin coat of banana oil that does not destroy the visibility of sculpture details and can easily be removed with absolute alcohol without harm to the fossils.

There was a good-sized collection of large, fairly thin slides of corals, especially of the Onondaga limestone, once made by Hall for a study of the corals. These were not transparent and lacked cover glasses. It was found that by treating them with shellac and putting the section inside against a black background, they became most beautiful transparent sections, exhibiting the delicate tracery of the coral structure in the finest detail; and a large exhibit of these was made.

The Museum contained extensive collections of Devonic corals, again largely from the Onondaga limestone, partly or wholly silicified in limestone. Specimens partly etched by weathering were collected in the early days in stone fences etc. It became desirable to etch these corals to such a depth that the larger part of the stock became free. It was found that in dipping the corals into diluted acid, the effervescing carbonic acid would destroy some of the more delicate structures. A siphon arrangement, however, developed by C. A. Hartnagel, by which the acid was dripped slowly on a particular spot, served to etch out gradually whole coral stocks without loss of the thinner corallites. Where it was desired that a solid platform remain for the coral stock to stand on, the block was suspended by clamps held in holes in the block with the coral downward in diluted acid; and beautifully etched specimens, as that of Romingeria, were obtained in this way. This method was not mentioned in the very complete chapter on chemical preparation in Stromer von Reichenbach's *Paläozoologisches Praktikum* and therefore is undoubtedly new.

In some cases, as in that of crinoids, it was desired to show both sides of the fossil, a result easily obtained by placing a small hand mirror behind the tilted object. In other cases, where enlargements of objects in the cases were to be shown, plano-convex lenses were attached by Canada balsam to the inside of the glass pane of the case. This otherwise excellent method of bringing the exhibit nearer to the visitor, has the disadvantage that small children want to look through the lenses and are liable to kick and scratch the drawers

under the cases, or the legs of the latter, when held up by their elders.

Models of various objects, mostly to show their interior structure, were made first in the rough in plasticine, then cast in plaster of Paris by way of a plaster of Paris mold. The final cast was worked out in detail—especially as far as reentrants, undercuts and hollow places that could not be cast were concerned—while the plaster was still moist and soft, with specially made tools of steel and boxwood. The senior author made thus the models of cephalopods and of growth-stages of eurypterids on exhibition, the latter in some cases standing free on their legs. The work proved to be both easy and interesting and can easily be carried out by scientists with no great artistic skill.

Later, under the influence of Henri Marchand, the plaster of Paris was replaced by wax, which allows more delicate tints and adds a transparency that gives life and beauty to the restorations and models. Mr Marchand was the first to develop in the Museum the making of wax groups of mushrooms by using glue molds. He later made for the Illinois State Museum a forest with some four hundred groups of mushrooms and a brook in the middle of the forest, an altogether admirable piece of museum work.

Mr Marchand also used running water falling in a cascade from the rocks in the Gilboa group, partly to add life to the group and partly to settle the dust into the pool by the resulting spray and moisture, as the group was too large to be encased in glass. The water seems so far to have succeeded well in keeping the group free from thick accumulation of dust.

Speaking of water, we should mention Mr Marchand's method of attaining an underwater effect in our Portage group of submarine life. Dr F. A. Bather in his valuable paper, *A Cargo of Notions,* has described this method as follows:

> An ingenious way of managing light for a special purpose is illustrated by figure 5, which is a section through a case displaying submarine life, in the New York State Museum. The light is daylight coming from the top. The top and front of the case are of clear glass. At the surface of the supposed water is a sheet of glass coated with a green varnish. All above this receives the ordinary daylight, while all below it is in a subdued green light, which gives, without loss of clearness, precisely the effect of being under water. Above the green glass is an ordinary painted background of shore scenery. Below it is a sheet of ground glass, on the far side of which are painted seaweeds; light coming from above is reflected through this and produces the illusion of a fading distance.

The lifelike restoration of the mastodon, with its coat of fur, was a new venture in instalment work. This has been already described by Noah T. Clarke in a previous Director's Report.

A very instructive model of the Mineville iron mine was obtained by a series of parallel glass plates, upon which sections of the ore-body, the parts of it already worked out and the surrounding rock are painted. This model was made by Robert Jones under the supervision of D. H. Newland.

We may finally add a few hints on methods of preservation and drawing used for years in our laboratory but not mentioned in books on museum work. Finding that the gutta-percha squeezes of fossils —often all that is left of a type when the fossil was but an impression in soft shale—became brittle and fell to pieces we have made copper electroplates of a number of them by covering the squeezes with graphite to make them conductive and putting them in an electroplating tank. Thus a copper mold is obtained from which the replica of the fossil is made. The process is very successful when handled with sufficient care and skill.

In the study of the eurypterids it was found that the leathery or chitinous shell of these creatures in the Bertie waterlime had been altered into a carbonized film that is not amenable to treatment by Eau de Javelle and other chemicals for the purpose of making the test transparent, as had been done by Holm with eurypterids from the island of Oesel. It was, however, found that by brief, carefully timed immersion in muriatic or nitric acid, the test could be lightened so that details of structure not visible before could be brought out. The senior author thus brought out the genital tubes of *Eurypterus remipes* (Clarke and Ruedemann, '12, pt 2, pl. 8, fig. 1), the epistoma of *Pterygotus macrophthalmus* (op. cit. pl. 71, fig. 5), the epistoma of *Hughmilleria socialis* in place (op. cit. pt. 1, p. 428, fig. 118) and other details figured by Clarke and Ruedemann in their memoir on the Eurypterida. This method is to be used with great care, however, as the film is easily destroyed.

The senior author in desiring to make natural size drawings of graptolites and other flat objects found a fairly easy and accurate method by putting a sheet of lithographer's gelatine over the fossil and tracing it with a lithographer's needle. Then, so that the drawing is not to appear reversed, its outlines may be traced with a needle on the reverse side. Into this drawing lamp-black is rubbed with a fine brush and transferred, by rubbing with the finger nail over the opposite side of the gelatine onto the paper laid below. The Lapworth-Parkes microscope offers now a means of obtaining more

accurate drawings of graptolites, but for larger objects, as eurypterids, the gelatine process is still very useful and easily applied.

We may add that our systematic collection was mounted on wood, following the National Museum method of mounting, with a mixture of glue and plaster of Paris. It was found that when the specimens were mounted on the painted surface they would come off in a few years, but where the paint was removed before mounting they have stood now for more than 15 years without any indications of loosening.

The authors will be glad to give more detailed information to any one interested, concerning any of these methods.

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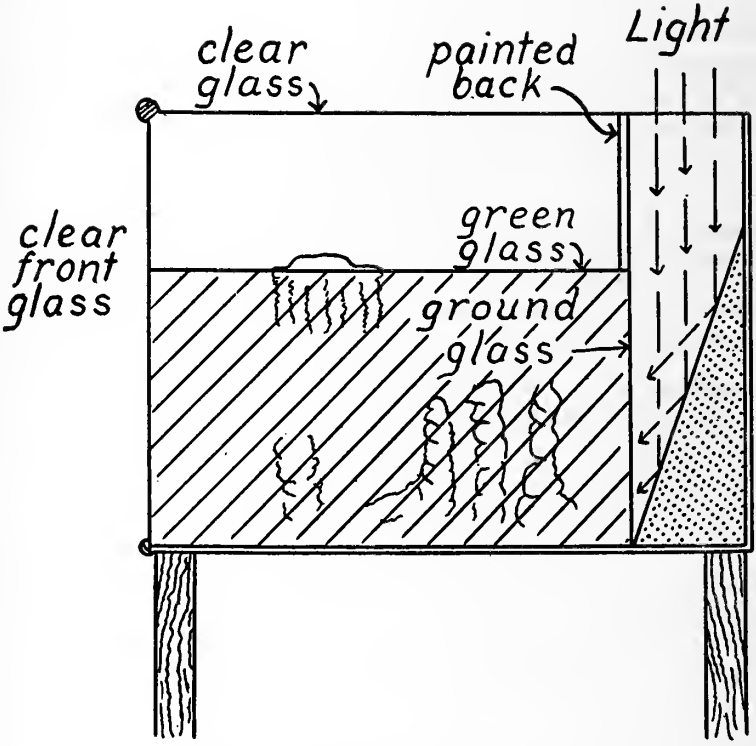


FIGURE 11 Section of case to show submarine life in New York State Museum (From Bather, 1926, p. 222, fig. 5)

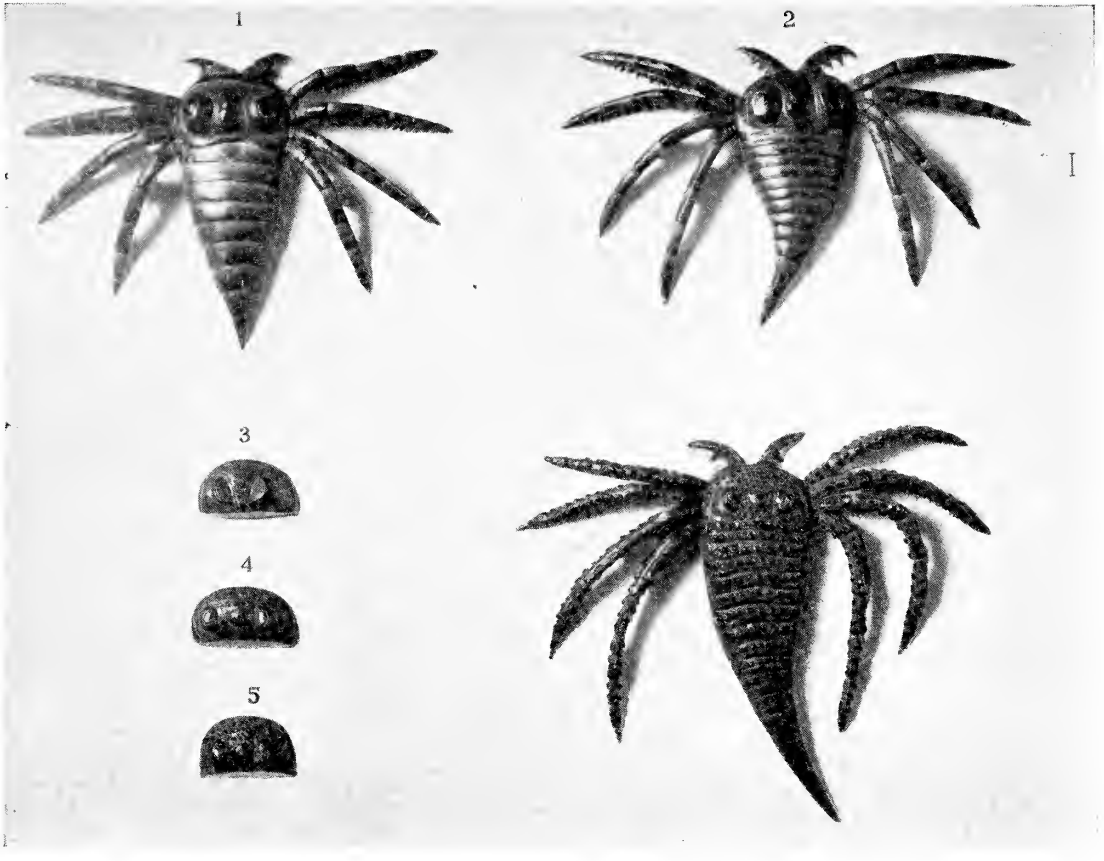


FIGURE 12 Growth stages of the eurypterid *Stylonurus,* modeled in plasticine and cast in plaster of paris

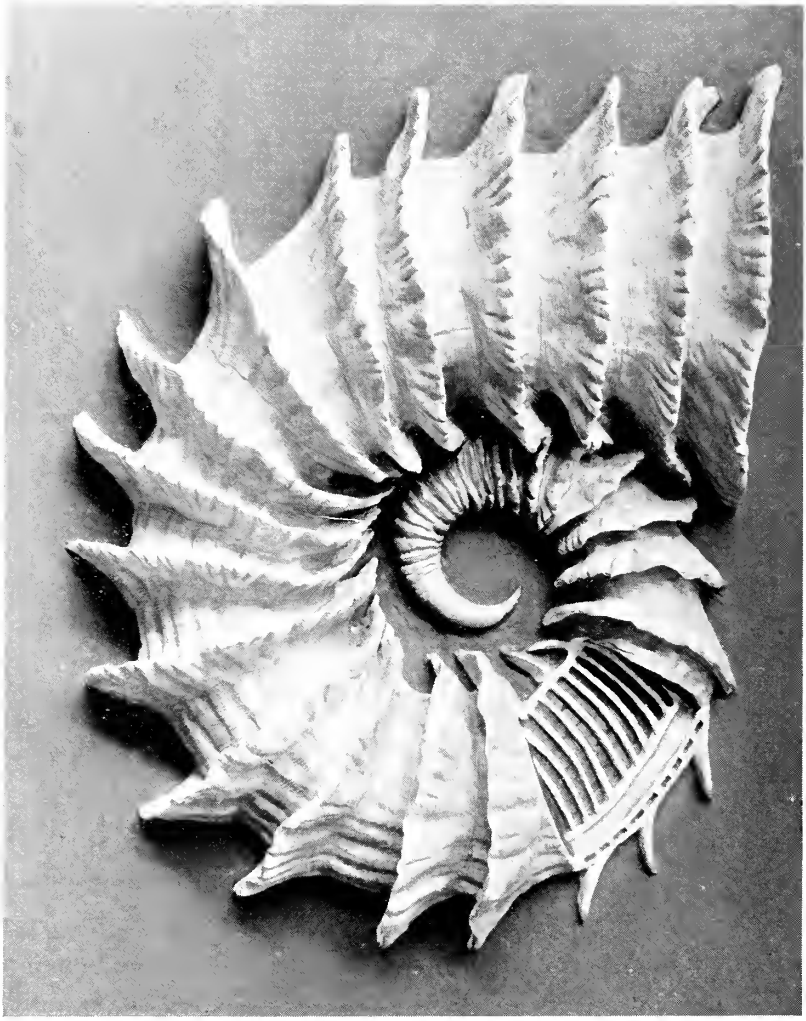

FIGURE 13 Restoration of the cephalopod *Rhyticeras*, modeled in plasticine and cast in plaster of paris

FIGURE 14 Restoration of the cephalopod *Manticoceras*, modeled in plasticine and cast in plaster of paris

FIGURE 15 The coral *Romingeria*, etched out by suspension in acid

FIGURE 16 The coral *Syringopora hisingeri,* etched out by siphon arrangement. Lateral view.

FIGURE 17 Top view of large stock of the coral *Syringopora maclurei*, etched out by siphon arrangement

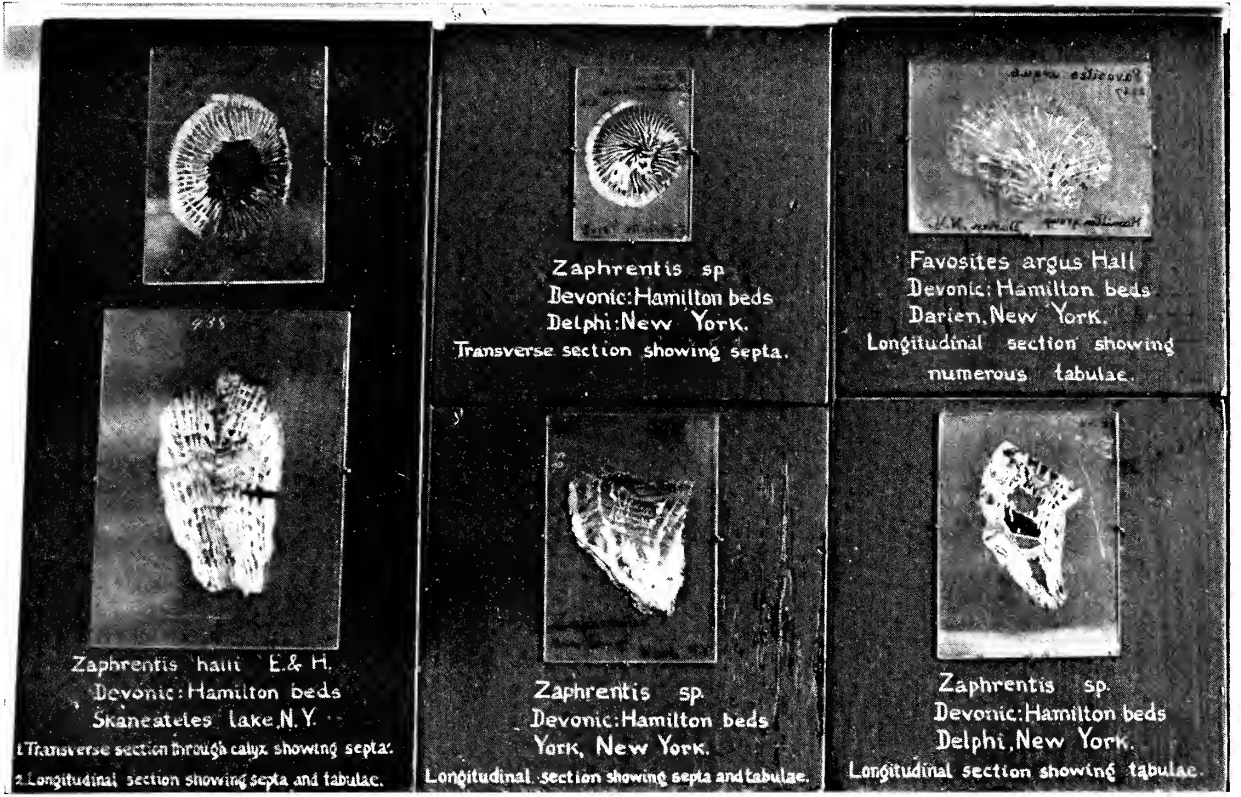


FIGURE 18 Group of coral sections made transparent by shellac

# THE WAMPUM BELT COLLECTION OF THE NEW YORK STATE MUSEUM

By Noah T. Clarke

*Archeologist, New York State Museum*

The majority of the wampum belts in the New York State Museum collection were obtained through the action of the Onondaga Nation, who were the former keepers of the wampum belts of the Iroquois Confederacy. In 1898 they elected The University of the State of New York the keeper of the wampum and the wampum records of the Onondaga Nation, the Five Nations and the Six Nations of the Confederacy. They, at the same time, sold and conveyed to the State these symbolic documents which recall early laws, alliances and other important events of historical interest. Thus the State of New York is charged with the duty and right to keep, hold and recover all the wampums of said nations as follows:

§ 27 **Custody of wampums.** The University of the State of New York, which was duly elected to the office of wampum-keeper by the Onondaga nation on February twenty-sixth, eighteen hundred and ninety-eight, and which by unanimous action of its Regents on March twenty-second, eighteen hundred and ninety-eight, accepted such election as authorized to do by law, and which accepted the custody of the wampums as formally transferred to the Chancellor as part of the exercises and with the unanimous approval, both of the election and transfer, by the council of the Five Nations held in the senate chamber of the capitol at Albany on June twenty-second, eighteen hundred and ninety-eight, by duly chosen representatives of all the original nations of the Ho-de-no-sau-nee, shall hereafter be recognized in all courts and places, as having every power which has ever, at any time, been exercised by any wampum-keeper of the Onondaga nation, or of any of the Ho-de-no-sau-nee, otherwise known as the Five Nations, or the Six Nations, or the Iroquois, and shall keep such wampums in a fire-proof building, as public records, forever, and is hereby authorized to secure by purchase, suit, or otherwise, any wampums which have ever been in the possession of any of the Ho-de-no-sau-nee, or any preceding wampum-keeper, and which are now owned by any of them or to which any of them is entitled, or to which it is entitled, in law or in equity, and to maintain and carry on suit to recover any of such wampums in its own name or in the name of the Onondaga nation at any time notwithstanding that the cause of action may have accrued more than six years, or any time, before the commencement of any such suit.

The provisions of this section shall not apply to the subject matter of any litigation pending on March twenty-seventh, eighteen hundred and ninety-nine, in any court of this State.

[*New York State Indian Law*]

Altogether the State Museum collection consists of 25 belts, including two of the largest known, the George Washington Covenant Belt, and the "Wing or Dust Fan Belt," both of which are examples of exquisite workmanship. Another very large belt is known as the "Presidentia," a chain type which was to have always been kept bright in friendship. The Hiawatha Belt is one of outstanding merit as it commemorates the establishment of the Iroquois Confederacy.

The name "wampum" is a term which the early New England colonists derived from the Algonkian name "wampomeag," meaning "a string" (of shell beads). Indians were attracted to the use of shells in their personal adornment by their natural beauty. On account of their thin, sharp edges, shells were brought into service as implements and utensils such as cups, spoons, scrapers, digging tools and knives.

Shell beads were the handiwork of the woman, whose skilful hands were accustomed to the delicate and tedious operation of their manufacture. Wampum beads are small cylindrical shell beads which measure about a quarter of an inch in length and one-eighth of an inch in diameter. They were wrought from various species of shells, but those made in the eastern section of the United States were cut from those found along the Atlantic sea coast, such as the common hard-shell clam, *Venus mercenaria;* the periwinkle, *Pyrula carica* and *P. canaliculata;* the whelk, *Buccinum undatum;* and fresh-water shells of the genus *Unio* (Hodge, '10, 904). These afforded the manufacture of two color varieties—the white, which was formed from the thicker portion of the shell, and the dark, or purple bead, cut from the purple spot in the clam shell.

In trade, wampum was used either in strings or loose. When loose, they were counted out and six beads equalled in value three of the dark ones or, according to one authority, the amount of one penny. By the string, they were measured into strands of 360 white and 180 dark beads. These were known as "fathoms" and each "fathom" was valued at 60 cents in trade.

Shell beads, or wampum, besides their use as necklaces and for purposes of exchange, were used in strings in public transactions of various nature and significance. Strung in different order or color combinations, they conveyed or recorded a definite idea or thought, which could be interpreted without confusion. White beads used alone in ritual or ceremonies conveyed the idea of peace, health and harmony; the dark or purple beads used alone in ceremonies denoted the idea of sorrow, death, mourning and hostility.

White beads were sometimes dyed red to signify the declaration of war, or used as an invitation to friends to join them in war.

The wampum belt was another product of these white and purple shell beads. In ancient times these beads were strung on twisted threads made from the inner bark of the elm tree and fashioned into mats or belts. A variety of symbolic designs were incorporated in the manufacture of these belts as a means of recording important events, in the ratification of treaties and, in some cases, to guarantee proposals made by one people to another.

Lewis H. Morgan ('52, p. 72) gives an account of making wampum belts, as follows:

The most common width was 3 fingers or the width of 7 beads, the length ranging from 2 to 6 feet. In belt-making, which is a simple process, eight strands or cords of bark thread are first twisted from filaments of slippery elm, of the requisite length and size; after which they are passed through a strip of deerskin to separate them at equal distances from each other in parallel lines. A splint is then sprung in the form of a bow, to which each end of the several strings is secured, and by which all of them are held in tension, like warp threads in a weaving machine. Seven beads, these making the intended width of the belts, are then run upon a thread by means of a needle, and are passed under the cords at right angles, so as to bring one bead lengthwise between each cord and the one next in position. The thread is then passed back along the upper side of the cords, and again through each of the beads; so that each bead is held firmly in its place by means of two threads, one passing under and one above the cords. This process is continued until the belt reaches its intended length, when the ends of the cords are tied, the end of the belt covered and afterwards trimmed with ribbons. In ancient times both the cords and the threads were of sinew.

### Hiawatha Belt

(Figure 19)

(Museum Catalog No. 37309)

*Size:* length, 21½ inches; width, 10½ inches; rows wide, 38.

*Acquired:* May 24, 1927, by bequest of Emma Treadwell Thacher of Albany, N. Y.

*Description:* This is in the form of a beaded mat on which a symbolic design in white beads has been worked in along its length, consisting of two hollow squares on either side of a figure of a heart (tree?) which occupies the center.

It is one of the most important and valuable Iroquoian wampum belts in existence and is considered the original record of the forma-

tion of the Iroquois League when representatives sat at the great council to ratify the union of the Five Nations. The exact age of this belt is unknown, but General Carrington has said that (Beauchamp, '01, p. 411) it is "the official memorial of the organization of the Iroquois Confederacy, relating back to the middle of the 16th century." It is referred to (New York State Supreme Court, '00, p. 11) as a "belt of dark wampum beads representing the Confederation organization of the Five Nations under Hiawatha." General John S. Clark, a witness for the plaintiffs in the Thacher case, is quoted as saying (New York State Supreme Court, '00, p. 59) "That it was made at the formation of the League representing the Five Nations united together by white lines through the central part of the Nations." The "reading" of this belt was made by Daniel and Thomas La Forte at Onondaga Castle, July 19 and August 1, 1898, as follows: (Beauchamp '01, p. 420) "One heart of the Five Nations —that if any hurt of any one animal would pierce that heart then they would all feel it—all of the Five Nations. This was in Hiawatha's belt. That they are a united people. This is the original Hiawatha belt—a record of the first agreement to make the League."

Under section 60 of the original Iroquois Code (Emblematical Union Compact) of the Great Binding Law, (Parker, '16, p. 47) reference is made to the interpretation of the designs on this belt:

The first of the squares on the left represents the Mohawk Nation and its territory; the second square on the left and the one near the heart, represents the Oneida Nation and its territory; the white heart in the middle represents the Onondaga Nation and its territory; and also means that the heart of the Five Nations is single in its loyalty to the Great Peace, that the Great Peace is lodged in the heart (meaning the Onondaga Confederate Lords), and that the Council Fire is to burn there for the Five Nations, and further, it means that the authority is given to advance the cause of peace whereby hostile nations out of the Confederacy shall cease warfare; the white square to the right of the heart represents the Cayuga Nation and its territory and the fourth and last square represents the Seneca Nation and its territory.

White shall here symbolize that no evil or jealous thoughts shall creep into the minds of the Lords while in council under the Great Peace. White the emblem of peace, love, charity and equity surrounds and guards the Five Nations.

In reversing the belt, the figure of the "heart" in the center assumes the appearance of a tree and at the same time brings the

geographical position of the Five Nations in the correct order on the belt. A figure of a tree might well represent the Onondaga Nation as the Onondagas were designated to keep the Council Fire and it was under the Great Tree of Light that the nations met in council.

*References*

Beauchamp, '80, p. 229, (third belt); '01, p. 411–12, 416–17, 420, pl. 22, fig. 252; Holmes, '83, p. 252–53, pl. XL; Parker, '16, p. 11–12, 47; Reynolds, '09, p. 231, 254 (CI), pl. fac. p. 208; N. Y. State Supreme Court, p. 11, 53–59, pls. fac. p. 56, 57, 104; U. S. Dep't Interior, p. 471–72, pl. fac. p. 472.

## Washington Covenant Belt

(Figure 20)

(Museum Catalog No. 37310)

*Size:* length, 6 feet 3½ inches; width, 5¼ inches; rows wide, 15; a total of about 10,000 beads.

*Acquired:* May 24, 1927, by bequest of Emma Treadwell Thacher of Albany, N. Y.

*Description:* The symbolic figures of 15 men with outstretched arms and clasped hands, extend along its length. In the center is a figure of a house, from the roof of which extends a protecting shelter for the man standing on either side. These two figures may be considered to be the Keepers of the East and West Doors, respectively, of the Iroquoian Long House and to be acting as guards to the open door of the effigy of the pale face house, or the National Capitol Building. The other remaining 13 figures, signifying the 13 original colonies, are joined in unity by the clasped hands. The designs are woven in the dark or purple beads on a solid white beaded field which denotes peace and friendship.

It is reputed as being unsurpassed in the excellence of its construction and it was the belt most highly prized by the wampum keepers of the Onondaga Nation. It is so called by reason of the fact that during the presidency of George Washington it was used as a covenant of peace between the 13 original states which he represented and the Six Nations of the Iroquois. Edward W. Paige, a New York attorney, says (Beauchamp, '01, p. 422) that this was the treaty of 1789 which is printed among the United States treaties.

The above belt is referred to (New York State Supreme Court, '00, p. 11) as "the First Treaty stipulated between the Six Nations and Gen. George Washington, picturing in wampum bead work the

Council House, General George Washington, the O-do-ta-ho, or President of the tribes, and 13 representatives of the Colonies." Again (op. cit., p. 60), General John S. Clark is quoted thus: "This was represented to be the belt that was made at the first treaty of the Five Nations with the general government at the time of the Revolutionary War, in which the 13 states are represented by human figures and the Five Nations are represented in the center. The 13 states represented as holding hands and connected with the central figure, who is To-do-da-ho, I suppose." A letter from Mr Thacher to Melvil Dewey, Secretary to the Board of Regents, written December 26, 1896 (op. cit., p. 5, 6) acknowledges that "the Washington belt is most interesting although far inferior in historical interest to the Hiawatha Belt" (Cat. No. 37309).

*References*

Beauchamp, '80, p. 229 (sixth belt); '01, p. 413, 422, pl. 22, fig. 248; Converse, '08, p. 143, pl. 10; Holmes, '83, p. 253, pl. XLII; N. Y. State Supreme Court, p. 5, 6, 11, 60, 75, pls. fac. p. 56, 57, 104; U. S. Dep't Interior, p. 471, 472, pl. fac. p. 472.

## Belt To Mark the Sight of the First Pale Faces

(Figure 21)

(Museum Catalog No. 37311)

*Size:* length, 28 inches; width, 3½ inches; rows wide, 13.

*Acquired:* May 24, 1927, by bequest of Emma Treadwell Thacher of Albany, N. Y.

*Description:* It is woven on buckskin thongs with a purple background bearing four groups of three white-beaded diagonal lines. It was made by the Iroquois to commemorate "the first coming of the people with white faces" (Beauchamp, '01, p. 423). We do not know whether this refers to the first sight of Spaniards, French or Dutch. John Buck, who was an Onondaga chief and once wampum keeper, remarked that diagonal stripes across a belt were symbols of agreement that the tribe giving the belt would help the Six Nations in war. These were props, or supports, for the Long House; the symbol of the Confederacy. In this sense the diagonal lines may be considered to signify the willingness of support to the whites by the Indians.

*References*

Beauchamp, '80, p. 230 (11th belt); '01, p. 415, 423, pl. 22, fig. 249; Holmes, '83, p. 253; Reynolds, '09, p. 231, 254 (B2); N. Y. State Supreme Court, p. 60, 81, 82, pls. fac. p. 56, 57, 104; U. S. Dep't Interior, p. 472, pl. fac. p. 472.

## Champlain Belt

(Figure 22)

(Museum catalog No. 37312)

*Size:* length, 39½ inches; width, 2 inches; rows wide, 7.

*Acquired:* May 24, 1927, by bequest of Emma Treadwell Thacher of Albany, N. Y.

*Description:* This belt is practically a duplicate of the Eli S. Parker Belt (37434) in the State Museum collection. Both belts are woven with purple-beaded backgrounds carrying five white hexagons equally spaced along its length. At each end, for the length of an inch, are alternating rows of white and purple beads, and the only apparent difference between this and the Parker Belt is that the latter has three white stripes at each end, while this one carries four. The "reading," as given by Daniel and Thomas La Forte (Beauchamp, '01, p. 419) at Onondaga Castle, July 19 and August 1, 1898, is as follows: "Represents a sorrow meeting of the Five Nations. If a misfortune happen: if little boys and girls were taken and one killed—to consider what should be done for remedy that misfortune—a tooth for a tooth, an eye for an eye. This is a Hiawatha belt. This belt is used when meeting of that kind is called." A label on this belt states that it commemorates the excursion of Samuel Champlain into the country of the Iroquois in 1609.

*References*

Beauchamp, '08, p. 229 (first belt); '01, p. 414, 419, pl. 22, fig. 251; Holmes, '83, p. 251–52, pl. XXXIX, fig. 2; Reynolds, '09, p. 231, 254 (B3)[1]; N. Y. State Supreme Court, p. 60, 81, pls. fac. p. 56, 57, 104; U. S. Dep't Interior, p. 472, pl. fac. p. 472.

## Penobscot Council Belt

(Figure 23)

(Museum catalog No. 37416)

*Size:* length, 22½ inches; width, 2⅛ inches; rows wide, 8.

*Acquired:* by purchase in 1907 from Mr W. C. Hill of New York City.

*Description:* This is a dark purple belt made on hemp thread and carries six double white diagonal bars distributed along its length. At the center is a small white square, the corners of which radiate four white lines to form an X-shaped figure.

It is reputed to have been made by the Iroquois and in the possession of Penobscot Indians at Oldtown, Maine. A. C. Parker ('08, p. 109) believes the "X" in the center signifies that "it is a command

and summons to a condolence council at Onondaga." The dark background may place it as originally used for condolences ceremonies.

*References*

Clarke, '16, pl. fac. p. 10; Parker, '08, p. 108–9, pl. 49, fig. 1.

### Fort Stanwix Treaty Belt

(Figure 24)

(Catalog No. 37415)

*Size:* length, 15½ inches; width, 2 inches; rows wide, 7.

*Acquired:* donated to the Museum in 1918 by Mrs Abraham Lansing (Catherine Gansevoort Lansing) of Albany, N. Y.

*Description:* This belt bears six diagonal purple bars, or braces, arranged in pairs on a white background. White denotes peace and friendship while the diagonal bars are supports to the Long House, the symbol for the Confederacy of the Six Nations. It is made on buckskin thongs.

When the peace treaty between the Six Nations of the Iroquois and the United States was signed on October 22, 1784, at Fort Stanwix (site of Rome, N. Y.) this belt was made and used to record that event. It was once the property of General Peter Gansevoort and was presented to the Museum by his granddaughter, Mrs Abraham Lansing.

*Reference*

Parker, '19, p. 102.

### Small Wampum of Unknown Origin

(Figure 25)

(Catalog No. 36514)

*Size:* length, 6½ inches; width, 2½ inches; rows wide, 7.

*Description:* Two purple circles on a white beaded field; woven on buckskin thongs.

### Ransom Belt

(Figure 32)

(Catalog No. 37417)

*Size:* length, 24¾ inches; width, 2 inches; rows wide, 6.

*Acquired:* through Mrs Harriet M. Converse.

*Description:* A partly mutilated purple beaded belt woven on thread and buckskin thongs. It carries five white diagonal stripes, one at each end and two at the center. On each side of the latter is a white open hexagon.

It was offered as a sign of ransom by women to release and adopt a condemned prisoner or murderer. According to the title attached when Mrs Converse obtained it, this "could save a life if presented by the youngest unmarried female in the family" (Beauchamp, '01, p. 428). Lewis H. Morgan remarked that among the Iroquois "six strings was the value of a life, or the quantity sent in condonation, for the wampum was rather sent as a regretful confession of the crime with a petition for forgiveness, than as the actual price of blood." It was the symbol for the authority invested in women to intercede on behalf of prisoners.

*References*

Beauchamp, '01, p. 428, pl. 21, fig. 247; Clarke, '16, pl. fac. p. 10; Converse, '08, p. 132–33; Parker, '08, pl. 30, fig. 1.

### Lewis H. Morgan Belt

(Figure 33)

(Catalog No. 37419)

*Size:* length, 27⅜ inches; width, 2 inches; rows wide, 7.

*Acquired:* in 1852, through Lewis H. Morgan.

*Description:* A comparatively recent dark purple belt made on threads and bound at each end by ribbon. This wampum is in perfect condition and carries nine white open diamond-shaped figures along its length, with a small white open square at one end.

This belt was made at Tonawanda, N. Y., from beads which Mr Morgan purchased (in October 1850) at Grand River, Ontario, Canada, from the daughter of Joseph Brant (Thayendanagea), the celebrated Mohawk war chief, to whom they formerly belonged. A. C. Parker remarks that it is "said to symbolize the peace between clans and villages"; but its principal value lies in the association it bears to the names of Brant and Morgan.

*References*

Beauchamp, '01, p. 386, pl. 21, fig. 241; Clarke, '16, pl. fac. p. 10; Holmes, '83, p. 251 (not accurate), pl. XXXVIII, fig. 1 (not accurate); Morgan, '52, p. 72 (not accurate), pl. 1, fig. 1 (not accurate); Parker, '08, pl. 30, fig. 2.

### Council Summons Belt

(Figure 26)

(Catalog No. 37433)

*Size:* length, 25½ inches; width, 2 inches; rows wide, 7.

*Acquired:* June 29, 1898, through council action of the Onondaga Nation.

*Description:* This belt consists of four pairs of diamond-shaped figures worked in purple on a white beaded background. Near one

end is a purple rectangular patch 22 beads long, on which is figured a small white cross. The other end is somewhat mutilated but it partly reveals a purple diamond containing a white cross. The belt is made on buckskin thongs.

Doctor Beauchamp remarks there should be five pairs of diamond-shaped figures if it is to be considered an alliance belt given at a treaty between the Seven Nations of Canada and the Five Nations of the Iroquois before 1600, as stated by Thomas Donaldson. He records it as a recent belt, by reason of the fact that wampum of this nature was unknown in inland New York at so early a date. Thomas Webster, O-ya-ta-je-wah, the Onondaga wampum keeper in 1888, referred to it as an Iroquois League Admission Belt. Daniel and Thomas La Fort, Onondaga Indians, gave the following interpretation (Beauchamp: '01, p. 422) on July 19 and August 1, 1898, to E. W. Paige. "This belt was used to call a meeting of the Five Nations, at which should be read all the laws. This was made when Hi-a-wat-ha was traveling and distributing the clans, and this belt made to represent the nations were divided into clans, and were to remain strictly so—that there could be no intermarriage."

*References*

Beauchamp, '80, p. 229 (eighth belt); '01, p. 415, 422, pl. 20, fig. 239; Clarke, '16, pl. fac. p. 10; Converse, '08, pl. 9, fig. 1; Holmes, '83, p. 251–52; Parker, '08, pl. 22, fig. 1, pl. 24, fig. 2; '16, pl. 7, fig. 1; N. Y. State Supreme Court, pls. fac. p. 56, 57, 104; U. S. Dep't Interior, p. 472, pl. fac. p. 472.

## Treaty Belt

(Figure 27)

(Catalog No. 37421)

*Size:* length, 27 inches; width, 2⅜ inches; rows wide, 6.

*Acquired:* June 29, 1898, through council action of the Onondaga Nation.

*Description:* A white Onondaga belt woven on twine. It carries four diagonal purple bars distributed along its length. These bars are formed by a series of six small purple rectangles which touch at opposite diagonal corners. Each rectangle is composed of ten purple beads which are half the length of the white beads. The belt originally had five diagonal bars when first seen by Doctor Beauchamp, who says ('01, p. 414) that it was then perfect and probably referred to the Five Nations of the Iroquois. The interpretation, as given by Thomas Donaldson when it had but the four bars, was: "A treaty when but four of the Six Nations were represented." In 1886 the Onondaga wampum keeper, Thomas Webster, said that it rep-

resented "the submission of each tribe when they joined the Confederacy." Again, in 1898, Daniel and Thomas La Fort of the Onondaga Nation related that the belt was made when the St Regis Indians were accepted for membership in the League, and that the diagonal bars on the belt represented braces, or supports, to a house to keep it from falling (the "house" meaning the Long House, or the League of the Iroquois). In other words, the support would be mutual among the nations.

*References*

Beauchamp, '01, p. 414, 423, pl. 20, fig. 238; Clarke, '16, pl. fac. p. 10; Converse, '08, pl. 9, fig. 2; Parker, '08, pl. 22, fig. 2; '16, pl. 7, fig. 2; N. Y. State Supreme Court, pl. fac. p. 57, 104; U. S. Dep't Interior, p. 472, pl. fac. p. 472.

### Remembrance Belt

(Figure 28)

(Catalog No. 37423)

*Size:* length, 40⅜ inches; width, 2½ inches; rows wide, 7.

*Acquired:* June 29, 1898, through council action of the Onondaga Nation.

*Description:* A long narrow purple pictographic belt. The beads are strung on fine white thread and woven over buckskin thongs. It is in perfect condition.

The traditional description does not seem to be appropriate in that it mentions that it carries the figure of a "Long House" (the symbol of the Confederacy) at one end, which is connected to a cross at the other by a long single ribbon of white beads. Donaldson's interpretation (Beauchamp, '01, p. 414) is more apt: "the guarded approach of strangers to the councils of the Five Nations" is shown by the figure of a man before an open diamond-shaped figure which could be the representation of an Indian Castle.

The cross was sometimes used to symbolize Canada, but instead of its referring to French Canada, Doctor Beauchamp thought "it is more likely to have been Moravian," as the Moravian Indians produced a somewhat similar belt in 1775 at the Grand Council of the Delawares and there was more or less intercourse between the Moravians and the Onondagas.

Arthur C. Parker believes the belt "records the treachery of a French missionary at Onondaga who sought to summon the French army from Canada" and memorizes the French invasion against the Five Nations. At the same time "it is an admonition against the French religion." As Doctor Beauchamp related, however, "the sole

reason for the missionary theory is found in the cross terminating the white line which reaches the man's head toward the other end."

Thomas Webster's interpretation and record (Beauchamp, '01, p. 422) (inaccurate, but interesting) given at Onondaga in 1886 follows: "The priest told the Onondagas that a building right by the mission house—and told them that there were goods there stored for the Onondagas, but he could not open them until the king came, and a white boy who had been captured had been told by the priest that it was full of arms—and when the king came they would annihilate the Onondagas. The boy told the chief, and they held a council and resolved to open the building. The priest tried to keep them from it, but they opened the door in spite of him, and found the building full of arms. They heated an ax red hot, and hung it upon the priest's heart, and it burnt his heart out. The French did come, and the Onondagas met them at Camden, and defeated them in a great battle, and then the Onondagas all renounced Catholicism. It was between Pompey and Jamesville, about this side of Pompey Hill. Cross means Canada. The white line a road from Canada to the Onondagas and the village at the other end."

*References*

Beauchamp, '80, p. 229, (seventh belt); '01, p. 413–14, 422, pl. 20, fig. 237; Clarke, '16, pl. fac. p. 10; Converse, '08, pl. 9, fig. 3; Holmes, '83, p. 251–52, pl. XXXIX, fig. 3; Parker, '08, pl. 22, fig. 3, pl. 23, fig. 1; '16, pl. 7, fig. 3; N. Y. State Supreme Court, p. 54, pls. fac. p. 56, 57, 104; U. S. Dep't Interior, p. 472, pl. fac. p. 472.

## Caughnawaga Belt

(Figure 29)

(Catalog No. 37418)

*Size:* length, 31⅝ inches; width, 2⅛ inches; rows wide, 7.

*Acquired:* June 29, 1898, through council action of the Onondaga Nation.

*Description:* This is a white belt strung on twine thongs. It carries a series of seven purple crosses along its length with a purple zigzag pattern at one end.

Donaldson alluded to this belt in 1890 (Beauchamp, '01, p. 415) as embodying "the pledge of seven Canadian 'Christianized' nations to abandon their crooked ways and keep an honest peace." In 1886 Thomas Webster (Beauchamp, '01, p. 415) called it a "St Regis tribe belt, given to mark their submission to the power of the Six Nations, with a promise of peace." According to A. C. Parker, it records the secession of the St Regis and Caughnawaga Indians from the League and their removal to Canada; interpreting it as meaning.

"Their path is not straight, they have forsaken the law and gone to the land of the cross."

*References*

Beauchamp, '80, p. 229 (fifth belt); '01, p. 415, 422, pl. 20, fig. 236; Clarke, '16, pl. fac. p. 10; Converse, '08, pl. 9, fig. 4; Parker, '08, pl. 22, fig. 4; '16, pl. 7, fig. 4; N. Y. State Supreme Court, pls. fac. p. 56, 57, 104; U. S. Dep't Interior, pl. fac. p. 472.

## Seneca Condolence Belt

(Figure 30)

(Catalog No. 37431)

*Size:* length, 40 inches; width, 2⅛ inches; rows wide, 7.

*Acquired:* through Mrs Harriet M. Converse.

*Description:* A dark purple belt woven on buckskin thongs. It bears the designs of two white diamonds and a horizontal V-shaped figure in white at one end.

Dark wampum belts were used in mourning councils when the ceremony of "raising up" new names and sachems (hoyaneh) took place. The custom in these ceremonies dictated that one clan should do the mourning, while the opposite clan condoled. These two clans may be represented by the diamond figures, while the V-shaped figure may signify the spreading antlers or "horns," the emblem for "authority" or "power."

Mrs Harriet M. Converse, who procured this belt for the Museum, said it once was held by the well-known Seneca, Chief Blacksnake.

*References*

Beauchamp, '01, p. 427–28, pl. 20, fig. 235; Clarke, '16, pl. fac. p. 10; Converse, '08, pl. 9, fig. 5; Parker, '08, pl. 22, fig. 5, pl. 23, fig. 2; '16, pl. 7, fig. 5.

## Huron Alliance Belt

(Figure 31)

(Catalog No. 37430)

*Size:* length, 31½ inches; width, 3½ inches; rows wide, 10.

*Acquired:* through Mrs Harriet M. Converse, who purchased it from Chief John Buck, Grand River, Canada.

*Description:* A perfect white belt woven on buckskin thongs. There are three diagonal purple bars distributed along the length. Each bar consists of three hollow purple squares placed corner to corner.

Chief John Buck, Skan-a-wah-ti, who was wampum keeper of the Grand River Reservation (Ontario, Canada) when Mrs Converse

purchased this belt for the Museum, related that it had originally belonged to the Seneca Nation and since the American Revolution it had been removed to Canada. Mrs Converse believed "this belt may have been an affiliation between the Huron and some of their neighbors, the Wyandots, Quatoghies, Neuters, Ka-kwas or others." In 1650 the Hurons were overthrown by the Iroquois, and on this account it was at one time thought that these diagonal bars or "braces" may have referred to some such alliance previous to that date, but Doctor Beauchamp points to the fact that the Hurons seldom employed treaty belts at that time, and says "the belt, if Huron, may be assigned to their later days."

*References*

Beauchamp, '01, p. 427, pl. 20, fig. 234; Clarke, '16, pl. fac. p. 10; Converse, '08, pl. 9, fig. 6; Parker, '08, pl. 22, fig. 6; '16, pl. 7, fig. 6.

### Wing, or Dust Fan of Council President

(Figure 34)

(Catalog No. 37420)

*Size:* length, 31½ inches; width, 14½ inches; rows wide, 50.

*Acquired:* 1898, through Rev. William M. Beauchamp.

*Description:* It is an Onondaga National Belt woven on buckskin thongs and is the widest wampum belt known. The design is composed of a series of ten connecting purple hexagon-shaped figures, on a white background; both of which are edged with a white and a purple line of beads.

Doctor Beauchamp has stated that the pattern and design are quite modern and that "it seems to represent an alliance, actual or proposed, and to be of the variety termed chain belts." It has been variously referred to as the "Wing," or "Dust Fan of the President of the Council" of the Six Nations; the "Wing Mat" used by the head man to shield him from the dust while presiding at the council; the "Second Belt used by the Principal Chief of the Six Nations." A. C. Parker refers to the design as representing "The Ever-growing Tree" which was the symbol of permanence of the Iroquois Confederacy, and says "It was displayed in confederate councils and was therefore sometimes called the 'Wing of the Chief Royaneh.' It was to protect the council and to keep the eyes of the 50 civil rulers free from dust. It was displayed whenever the League Constitution was recited."

*References*

Beauchamp, '80, p. 229 (fourth belt); '01, p. 412, 420, pl. 21, fig. 244; Clarke, '16, pl. fac. p. 10; Converse, '08, p. 141; Holmes, '83, p. 253; Parker, '08, pl. 25; '16, pl. 2; N. Y. State Supreme Court, pls. fac. p. 56, 57, 104; U. S. Dep't Interior, p. 471, 472, pl. fac. p. 472.

### To-ta-da-ho Belt

(Figure 35)
(Catalog No. 37428)

*Size:* length, 27 inches; width, 14 inches; rows wide, 45.

*Acquired:* 1898, through Rev. William M. Beauchamp.

*Description:* A remarkably wide belt (the second widest known) woven on buckskin thongs. This belt is somewhat similar in general appearance to the "Wing," or "Dust Fan Belt" (cat. no. 37420) and may be contemporaneous, if not made by the same person. The design consists of a series of large overlapping purple triangles which are regularly arranged over the length. Along its central axis appears a chain of 14 small white open diamond-shaped figures. The background is made in white beads.

This is an Onondaga belt and sometimes termed the "Presidentia." It is known to have been longer at one time and bore 16, instead of 14, diamonds, as at present. The chain of diamonds has been represented as signifying a covenant, or a chain of friendship, always "to be kept bright." The belt was employed during council meetings of the Six Nations and, according to Thomas Webster, (Beauchamp, '01, p. 412) it was "the first belt used by the principal chief" at such meetings. It was placed in the custody of the Onondaga wampum keeper at Onondaga in 1847 and is considered a comparatively modern belt.

*References*

Beauchamp, '80, p. 229, (second belt); '01, p. 412–13, pl. 19, fig. 232; Clarke, '16, pl. fac. p. 10; Converse, '08, pl. p. 119; Holmes, '83, p. 253, pl. XLI; Parker, '08, pl. 26; N. Y. State Supreme Court, p. 82, pl. fac. p. 56, 57, 104; U. S. Dep't Interior, p. 471, 472, pl. fac. p. 472.

### Alliance Belt

(Figure 36)
(Catalog No. 37422)

*Size:* length, 28 inches; width, 3⅜ inches; rows wide, 12.

*Acquired:* June 29, 1898, through council action of the Onondaga Nation.

*Description:* A white beaded national belt of the Onondagas, containing six purple diagonal bars, or braces, along its length. It is somewhat mutilated and when first seen by General John S. Clark of Auburn, N. Y., it contained seven of these diagonal bars, and it may have contained a greater number once, for General Clark's photograph of it then showed it to have been mutilated at both ends.

It has been incorrectly explained as commemorating the entrance of the Tuscarora Nation into the League of the Iroquois in 1713.

As the belt once bore seven bars, this interpretation may be eliminated for the reason that the Tuscaroras were the sixth nation to enter the League.

The use of diagonal bars on a belt signified support to the Long House, the symbol for the League.

*References*

Beauchamp, '80, p. 230 (ninth belt); '01, p. 414, 422, pl. 21, fig. 240; Clarke, '16, pl. fac. p. 10; Parker, '08, pl. 27, fig. 2; '16, pl. 8, fig. 2; N. Y. State Supreme Court, pls. fac. p. 56, 57, 104; U. S. Dep't Interior, p. 472, pl. fac. p. 472.

## Wolf Belt

(Figure 37)

(Catalog No. 37429)

*Size:* length, 32½ inches; width, 4⅜ inches; rows wide, 14.

*Acquired:* July 24, 1898, by Mrs Harriet M. Converse from a St Regis Indian.

*Description:* This is a pictographic National Belt of the Mohawks. In the center are two human figures joined by clasped hands. Near and facing each end is the effigy of a wolf and at the extreme ends are seven short purple horizontal stripes which alternate with seven white stripes. These stripes are practically eliminated at one end by partial mutilation. The belt is made on buckskin thongs.

The seven purple stripes, according to Mrs Harriet M. Converse, represent seven nations. The central figures denote friendly relationship between the white man and Indian; the white beaded background indicates peace, while the wolves are an insinuation of guardianship of this peace and friendship. It has been mentioned that wolves symbolize the keepers of the east and west door of the Long House, but Beauchamp infers some doubt as to this by taking issue with John Buck's statement that "the hereditary keeper of the eastern door of the Long House was a wolf."

*References*

Beauchamp, '01, p. 427, pl. 19, fig. 229; Clarke, '16, pl. fac. p. 10; Parker, '08, pl. 27, fig. 1; '16, pl. 8, fig. 1.

## Five Nations Alliance Belt

(Figure 38)

(Catalog No. 37424)

*Size:* length, 16¼ inches; width, 2 inches; rows wide, 7.

*Acquired:* through Mrs Harriet M. Converse, who obtained it on June 23, 1899, from the heirs of Mary Jemison (the white captive of the Senecas), who once held this belt in her custody.

*Description:* This is a dark purple belt woven on fine buckskin thongs which are double along the edges. It has a series of three open white diamond-shaped figures.

The name given this belt was applied when it contained five diamond-shaped figures. Doctor Beauchamp related ('01, p. 406) that he had seen the remainder of this belt and estimated that it measured 24 inches in length before mutilation. Mrs Converse thought (Beauchamp, '01, p. 407) that the belt had been divided "according to the old law" for purposes of ransoming some prominent or important captive. She remarked that "this belt is exceptionally rare and has no duplicate." A. C. Parker believes that it was "used to signify the voice of the Confederacy in some international affair" and that the removal of the two diamond figures from the belt was caused by the dissension of two nations of the Confederacy to some proposal advanced in a council meeting.

*References*

Beauchamp, '01, p. 406–7, pl. 21, fig. 243; Clarke, '16, pl. fac. p. 10; Parker, '08, pl. 29, fig. 1.

## Gyantwaka Treaty Belt

(Figure 39)

(Catalog No. 37432)

*Size:* length, 7¼ inches; width, 2¾ inches; rows wide, 10.

*Acquired:* on the Cornplanter Reservation (Pa.) in June 1899, through the efforts of Mrs Harriet M. Converse.

*Description:* A short fragment made on buckskin thongs and woven solely in purple beads.

This is a portion of the belt given to the civil chief, Cornplanter (Gyantwaka) when the treaty of the Cornplanter Reservation was consummated. At the time of Cornplanter's death in 1836, the belt was divided among his heirs and these portions have been broken up into burial and council strings and variously scattered. Mrs Converse said of it: "This remnant has never been separated from the treaty, and is a record of the history of the Five Nations. Cornplanter's name and mark head the list of the chiefs who signed, and the treaty and belt were given to him to preserve for his people."

*References*

Beauchamp, '01, p. 407–8, pl. 21, fig. 245; Clarke, '16, pl. fac. p. 10; Parker, '08, pl. 29, fig. 2.

### Cornplanter Condolence Belt

(Figure 40)

(Catalog No. 37426)

*Size:* length, 36½ inches; width, 2 inches; rows wide, 7.

*Acquired:* through Mrs Harriet M. Converse.

*Description:* A long, narrow, somewhat mutilated belt made entirely of purple beads strung on fine buckskin thongs which are double and twisted along the edges. It once may have carried five white designs of some nature in the now regularly distributed gaps along its length.

It was the personal belt of the once noted Seneca civil chief, Cornplanter. The demonstration of sorrow was portrayed by dark wampum and was conveyed by this belt when exhibited during the ritualistic ceremonies performed for deceased sachems.

In obedience to a dream, Cornplanter destroyed all of his personal effects except this belt and a tomahawk (also in the State Museum). He resigned his title in favor of an Indian by the name of Canada who resided on the Tonowanda Reservation and when this successor was installed in office he received these two tokens.

*References*

Beauchamp, '01, p. 406, pl. 19, fig. 230; Clarke, '16, pl. fac. p. 10; Parker, Arthur C., '08, pl. 29, fig. 3; Parker, Eli S., '51, p. 100–1.

### General Eli S. Parker Belt

(Figure 41)

(Catalog No. 37434)

*Size:* *length,* 37¾ inches; width, 2 inches; rows wide, 7.

*Acquired:* In 1899, through Mrs Harriet M. Converse.

*Description:* This fine belt is woven with a purple beaded background bearing five white open hexagons equally spaced along its length. At each end there are three short white stripes. It is almost identical with the Onondaga belt (cat. no. 37312) received from the Thacher estate, except that the latter carries four short white horizontal stripes at each end. It is made on buckskin thongs which are twisted double on the edges.

The five white hexagons have reference to the Five Nations; and from the notes and comments concerning this belt written by Mrs Converse at the time when she obtained it for the State in 1899, we learn that it is a "Five council fires, or death belt of the Five Iroquois Nations, or the confederacy of the Iroquois." "This belt," she continues, "I value perhaps more than any other in the possession of

the State, inasmuch as the death belts were in the custody of the keepers of the east and west doors of the Ho-de-ne-sau-neh. This one was always held by the Do-ne-ho-ga-wah, the keeper of the west door, the Seneca Nation, who were the guardian of the west door, the watcher and army guard of the confederacy. The Mohawks of the east door should have its mate in Canada. This belt signified death or war against some other nation or nations. When it was sent to the east door, the Hudson river, it was held in the council of war of each of the nations, Cayugas, Oneidas, Onondagas, Senecas and Mohawks, till returned by the latter, which signal was that the war must begin at once. It represented death or absolute extermination, or absorption by adding to the numbers of the Iroquois, whichever they decided on. The red paint, with which it was always decorated at the time of its journeys may be seen on it now."

"In 1845 the Senecas abandoned the tribal government, and the one surviving portion of the body—the Tonawanda Senecas—became the actual proprietors of the death belt. During the lifetime of the Donehogawah, General Eli S. Parker, he held it, and bequeathed it to his daughter. By the consent of his widow I have procured it for the State. To the Tonawandas it was of no material value, as they have been at peace for more than a century; therefore they relinquished their title to it when they ratified the transfer of the wampum to The University of the State of New York last June. This precious relic will now forever remain with the State, and it is my request that the name of General Eli S. Parker shall be attached to it in his memory, not only as the most distinguished of his later people, but as the last 'keeper of the west door' of the confederacy of the Iroquois."

In this connection, it may be interesting to note that General Parker, as military secretary to General Grant during the Civil War, engrossed the terms on which General Lee surrendered.

*References*

Beauchamp, '01, p. 404–5, pl. 19, fig. 231; Clarke, '16, pl. fac. p. 10; Parker, '08, pl. 29, fig. 4.

### Nomination Belt

(Figure 42)

(Catalog No. 37427)

*Size:* length, 24¼ inches; width, 3 inches; rows wide, 9.

*Acquired:* through Mrs Harriet M. Converse, who obtained it in 1882 from Martha Hemlock, an old Cattaraugus Seneca Indian, who had then had it for 60 years.

*Description:* It is a pictographic Seneca National Belt woven with a white beaded background on buckskin thongs. Six purple beaded human figures, joined by extended arms, are distributed along its length. Between the two central figures is a purple square, to denote the council fire.

This Nomination Belt is so called because it was the document of authorization to Iroquois women giving them the right to choose, nominate and confirm the "raising up" of the 50 sachems, or civil chiefs (Ho-di-ya-ne-sho-onh) of the Confederacy.

*References*

Beauchamp, '01, p. 428, pl. 21, fig. 246; Clarke, '16, pl. fac. p. 10; Parker, '08, pl. 28, fig. 1; '16, pl. 4, fig. 1.

### Hospitality, or Welcome Belt

(Figure 43)

(Catalog No. 37425)

*Size:* length, 22⅞ inches; width, 2 inches; rows wide, 6.

*Acquired:* through Mrs Harriet M. Converse, who obtained it in 1898 on the Grand River Reservation, Ontario, Canada.

*Description:* This is a Canadian Mohawk belt made on thread and buckskin thongs. It has three diagonal purple beaded bars, or "braces," distributed equidistantly over its white beaded background. The central portion has been partly mutilated.

The "braces" infer an extension of friendship by the presiding officer to visiting delegates to the League Councils.

*References*

Beauchamp, '01, p. 428, pl. 21, fig. 242; Clarke, '16, pl. fac. p. 10; Parker, '08, pl. 28, fig. 2; '16, pl. 4, fig. 2.

The Museum of the American Indian has 37 belts in its collection. The New York State Museum collection consists of 25 belts with much more complete information concerning them, which correspondingly enhances to a greater extent their historical value. The United States National Museum regards the New York State Museum collection with "preeminence" in comparison to the three belts in its collection. Now, with the recent bequest of the Thacher estate of four valuable belts, the New York State Museum collection of wampums may be considered to excel any other of this nature.

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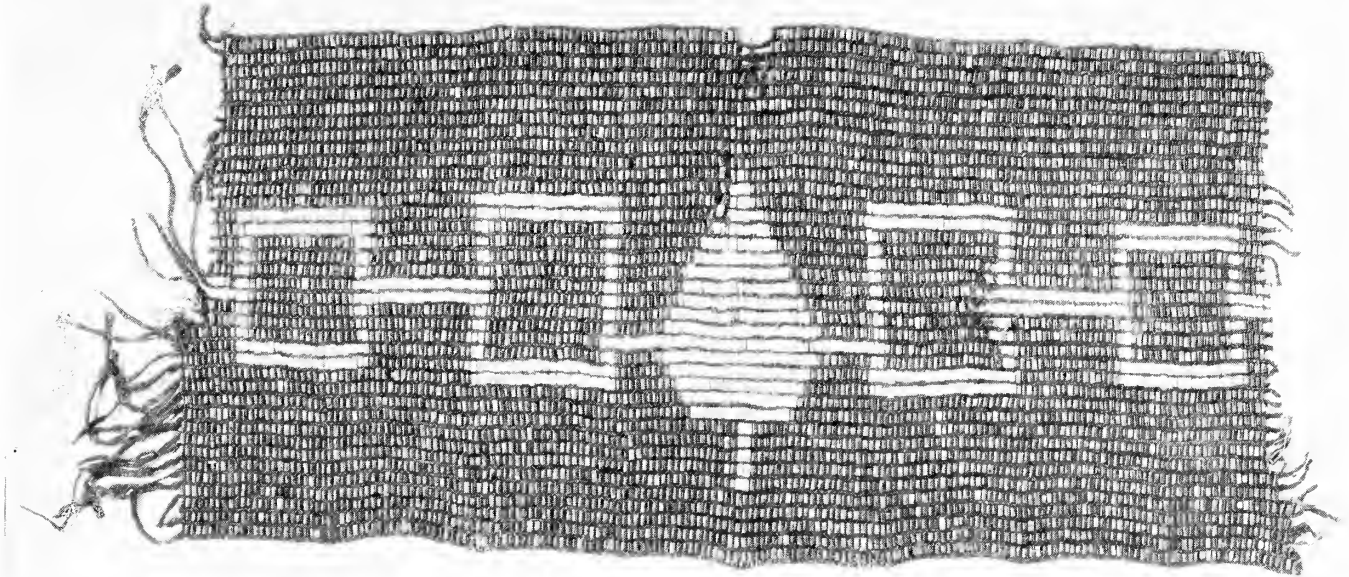


FIGURE 19 The Hiawatha Belt. Considered the original record of the formation of the Iroquois League of the Five Nations. It is one of the most important and valuable wampum belts in existence.

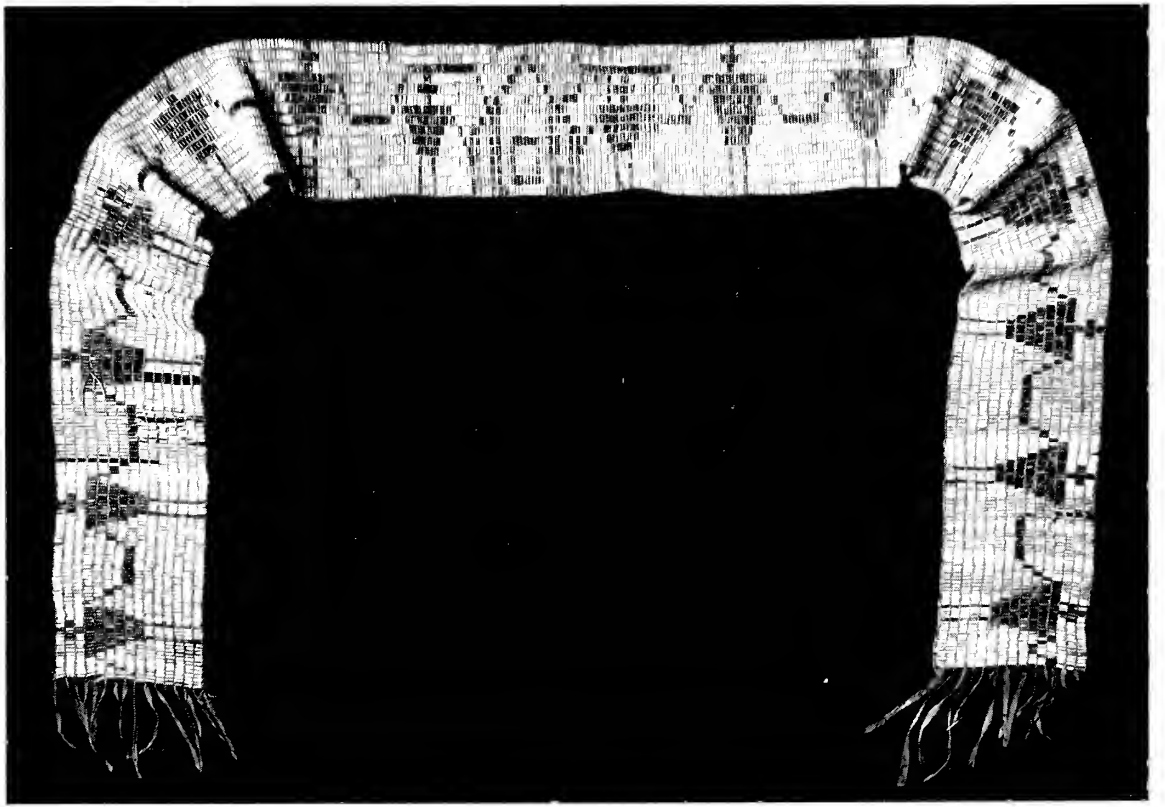


FIGURE 20 The Washington Covenant Belt. Used during the Presidency of George Washington as a covenant of peace between the 13 original colonies and the Six Nations of the Iroquois. This is one of the finest examples of workmanship of this nature.

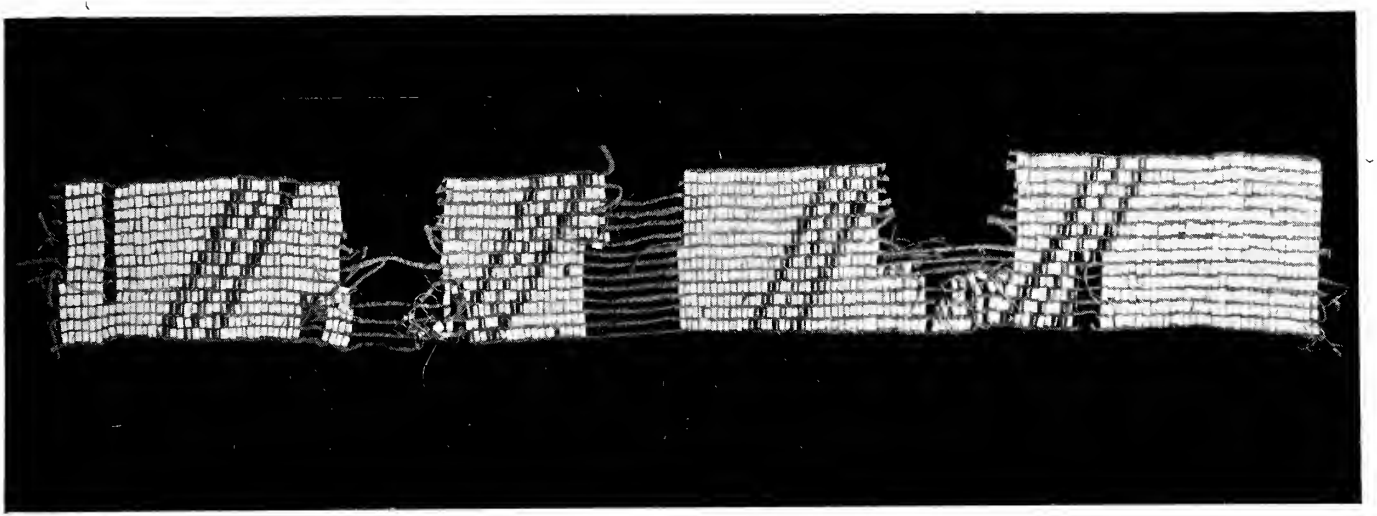


FIGURE 21 Belt to mark the sight of the first pale faces. The purple diagonal lines were used to signify agreement and were symbols of props, or supports, to the Long House of the Iroquois.

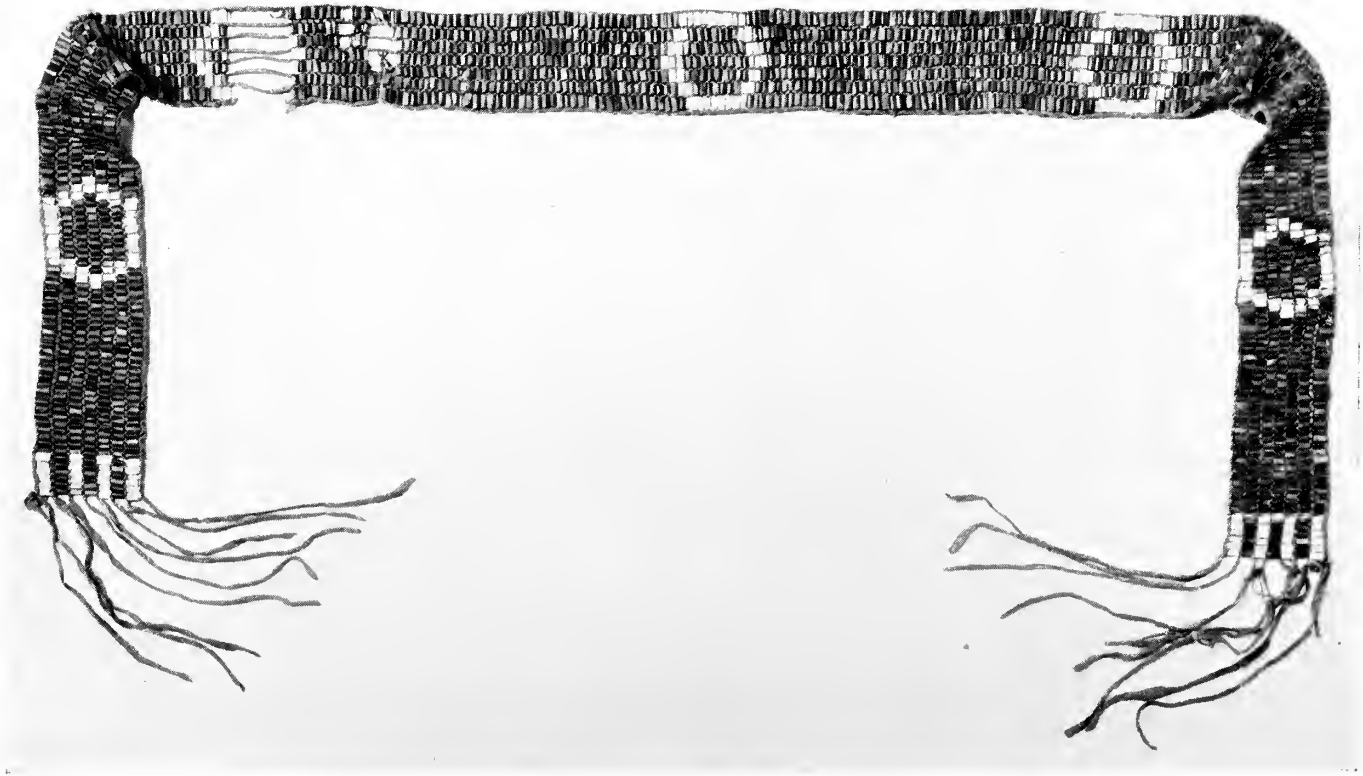


FIGURE 22 The Champlain Belt. The five white circles symbolized the Five Nations of the Iroquois into whose country Champlain penetrated in 1609.

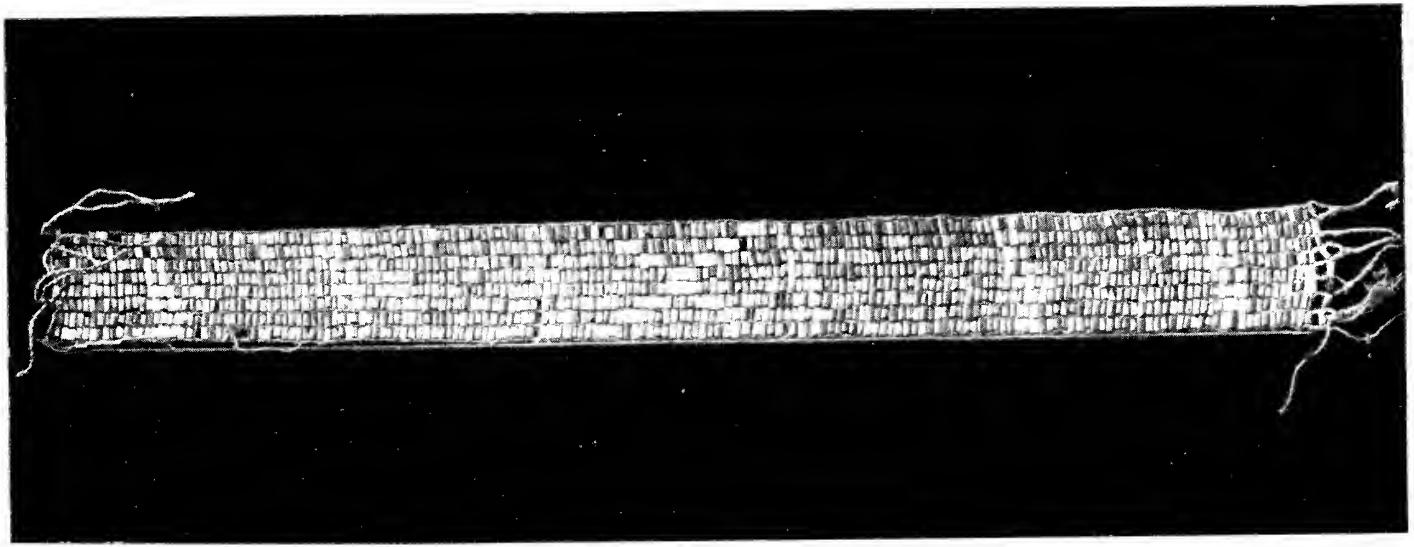


FIGURE 23 Penobscot Council Belt. Used to symbolize the authority for the council's action.

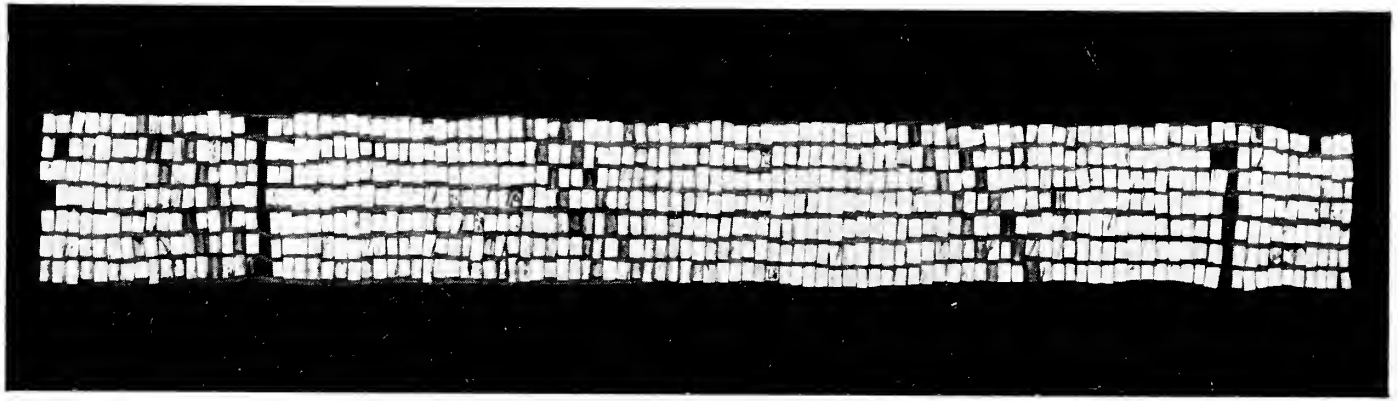


FIGURE 24 Fort Stanwix Treaty Belt. Passed at the signing of the treaty between the Six Nations and the United States at Fort Stanwix on October 22, 1784. Presented to the Museum by Catherine Gansevoort (Mrs Abraham Lansing) of Albany in 1918.

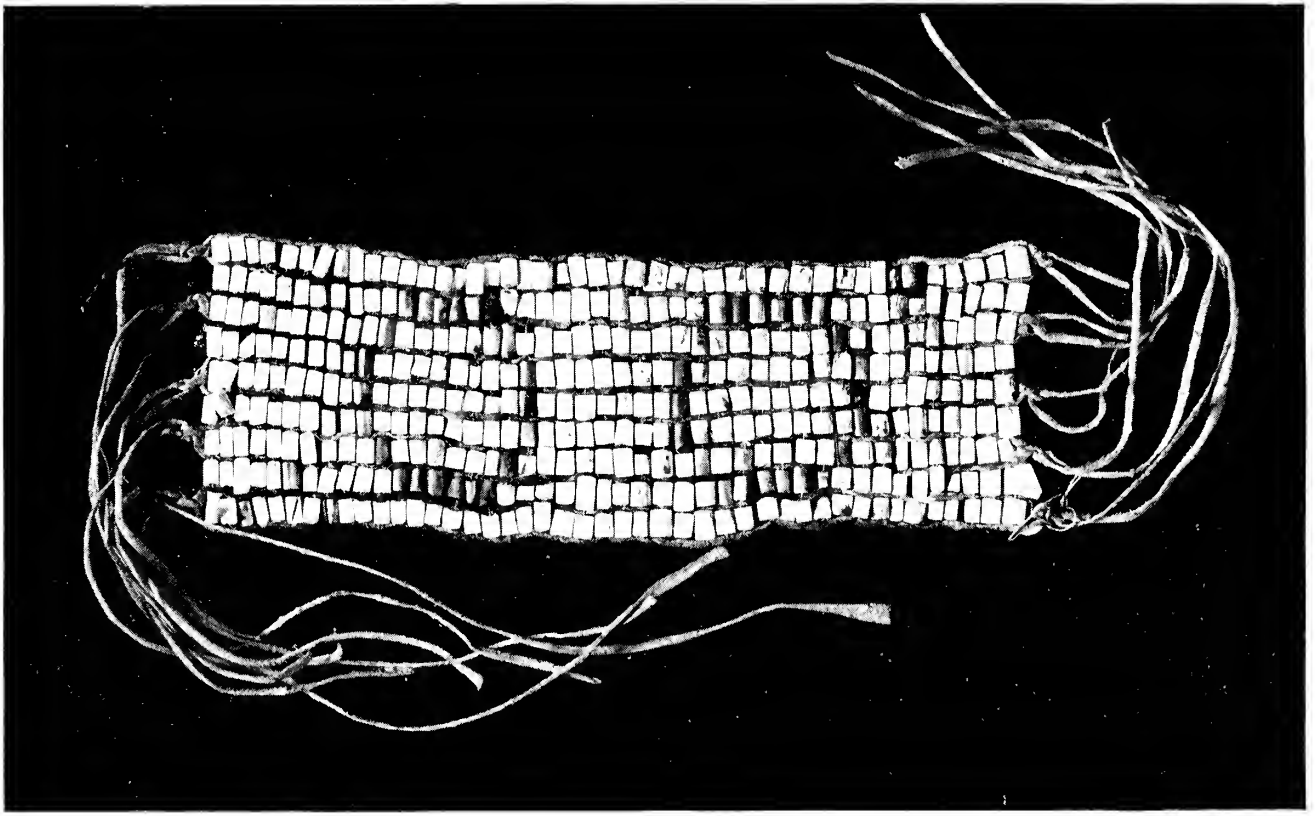


FIGURE 25 Small wampum of unknown origin.

FIGURE 26 Council Summons Belt. Used in calling a meeting of various clans. It has been referred to as an alliance between the Iroquois and the Seven Nations of Canada.

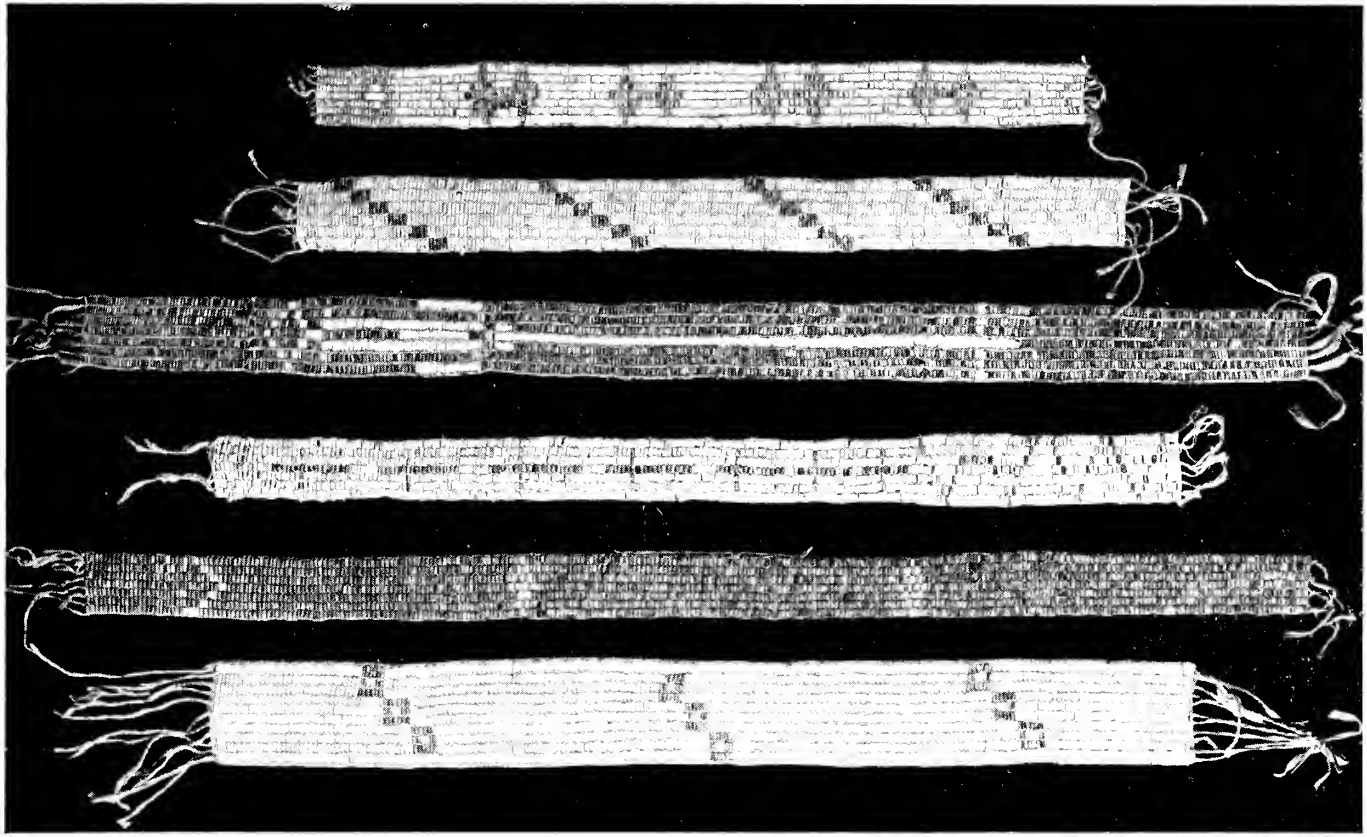
FIGURE 27 Treaty Belt. Signifying "friendship" by its white background, and "support" by the diagonal bars, of which it originally had five.

FIGURE 28 Remembrance Belt. Variously interpreted as signifying some treachery. The cross was used, on occasion, to signify French Canada. In this instance it possibly denotes a guarded path to the council fire.

FIGURE 29 Caughnawaga Belt. To commemorate the event of these Indians joining the St Regis Indians on a Christian basis, leaving forever their crooked path for that of the cross.

FIGURE 30 Seneca Condolence Belt. Dark-beaded belts conveyed the idea of sorrow. This was used in mourning councils by the Senecas when new names and sachems were "raised up."

FIGURE 31 Huron Alliance Belt. Commemorating an affiliation with a neighboring tribe. It became a Seneca belt in 1650 and was removed to Canada after the American Revolution.



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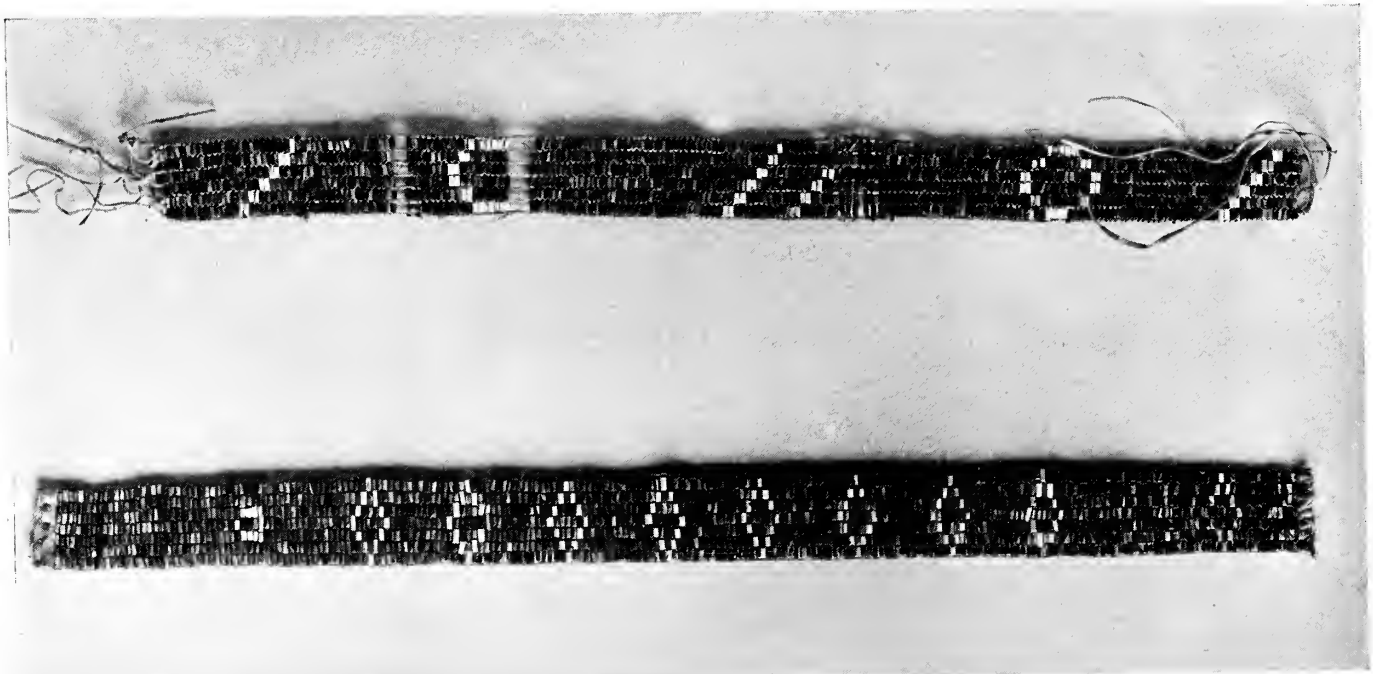

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FIGURE 32 Ransom Belt. It was a symbol for the authority invested in women to intercede on behalf of prisoners.
FIGURE 33 Lewis H. Morgan Belt. Made in 1850 from beads once in the possession of the celebrated Mohawk war chief, Joseph Brant.

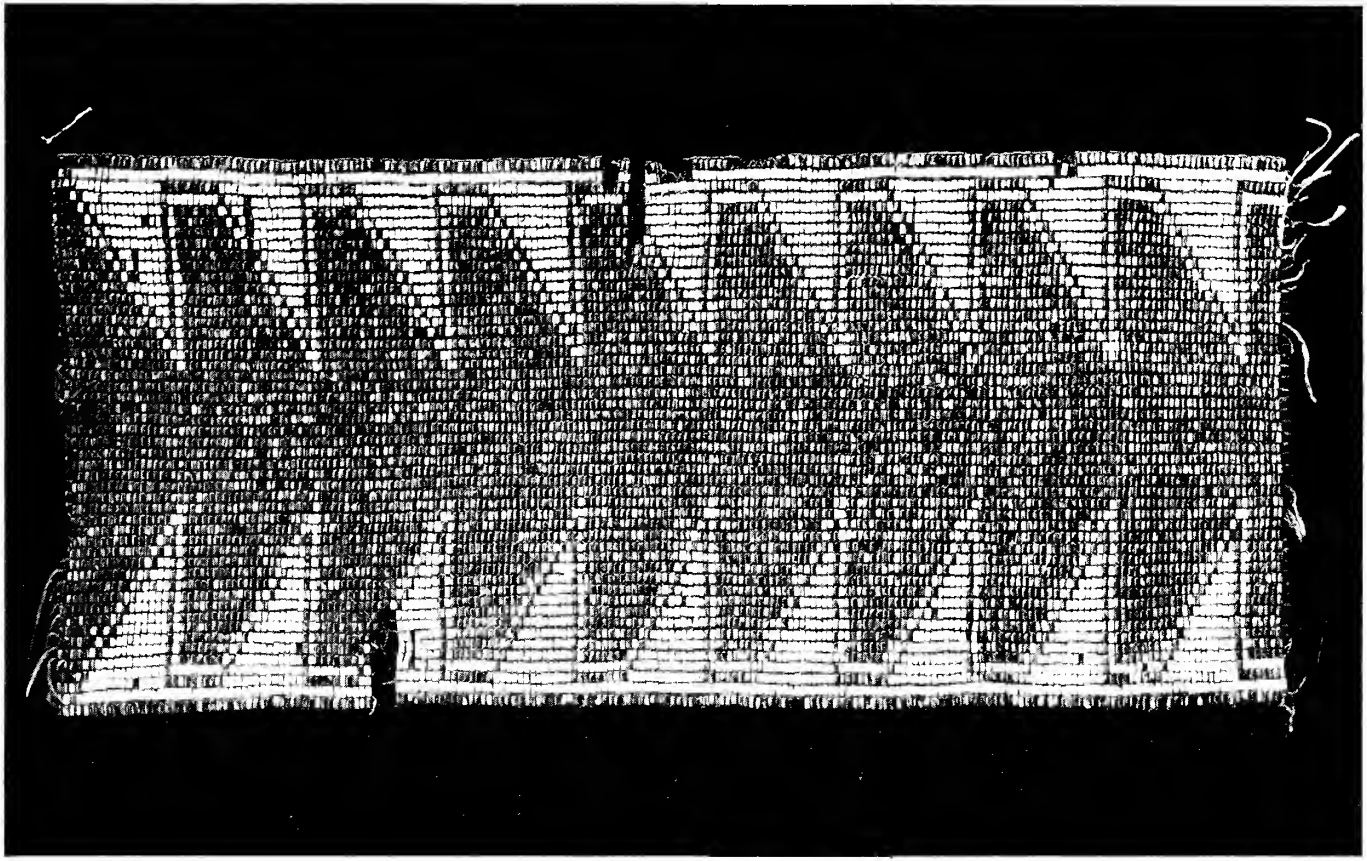

FIGURE 34 Wing, or Dust Fan of Council President. The Ever-growing Tree which was displayed whenever the constitution of the Six Nations was recited. The widest belt known to exist.

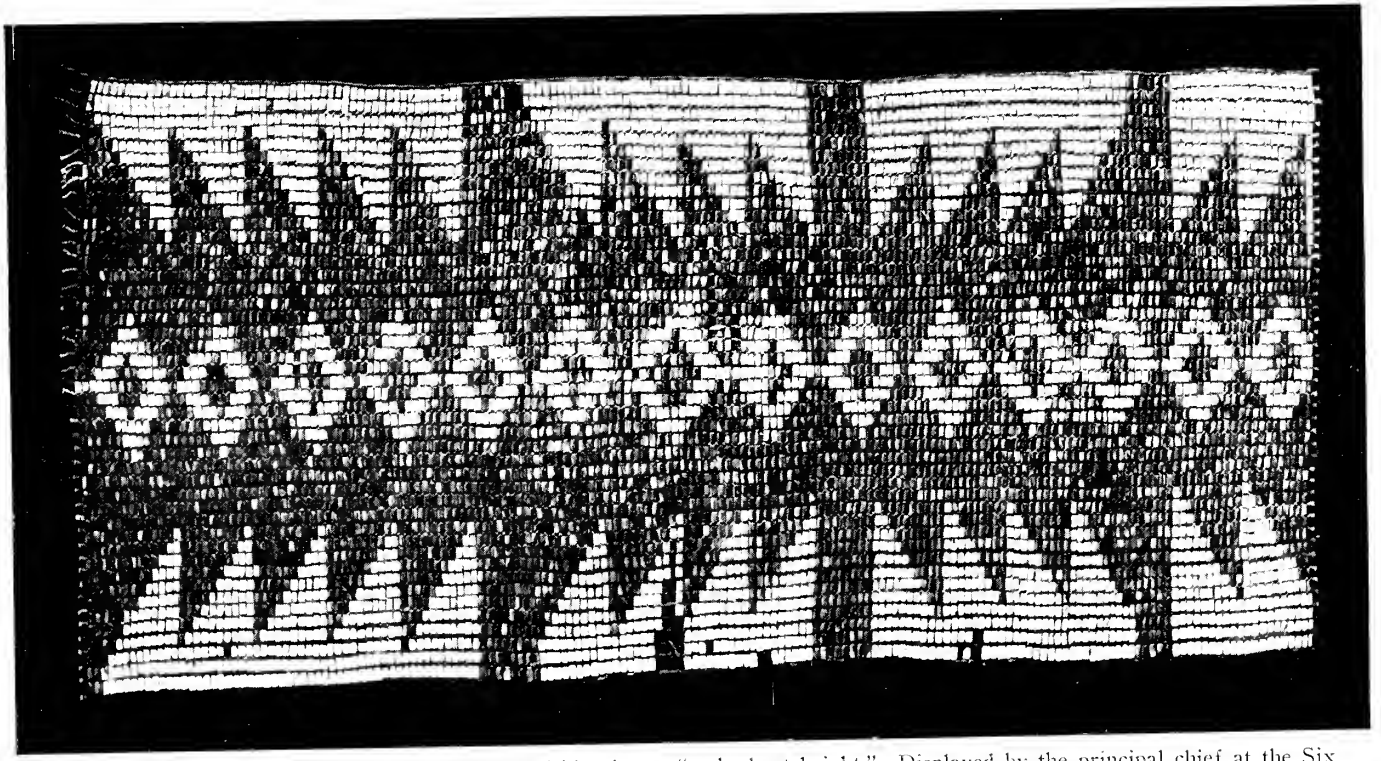

FIGURE 35 To-ta-da-ho Belt. A chain of friendship always "to be kept bright." Displayed by the principal chief at the Six Nations Council. Also called the Presidentia and is the second widest belt known to exist.

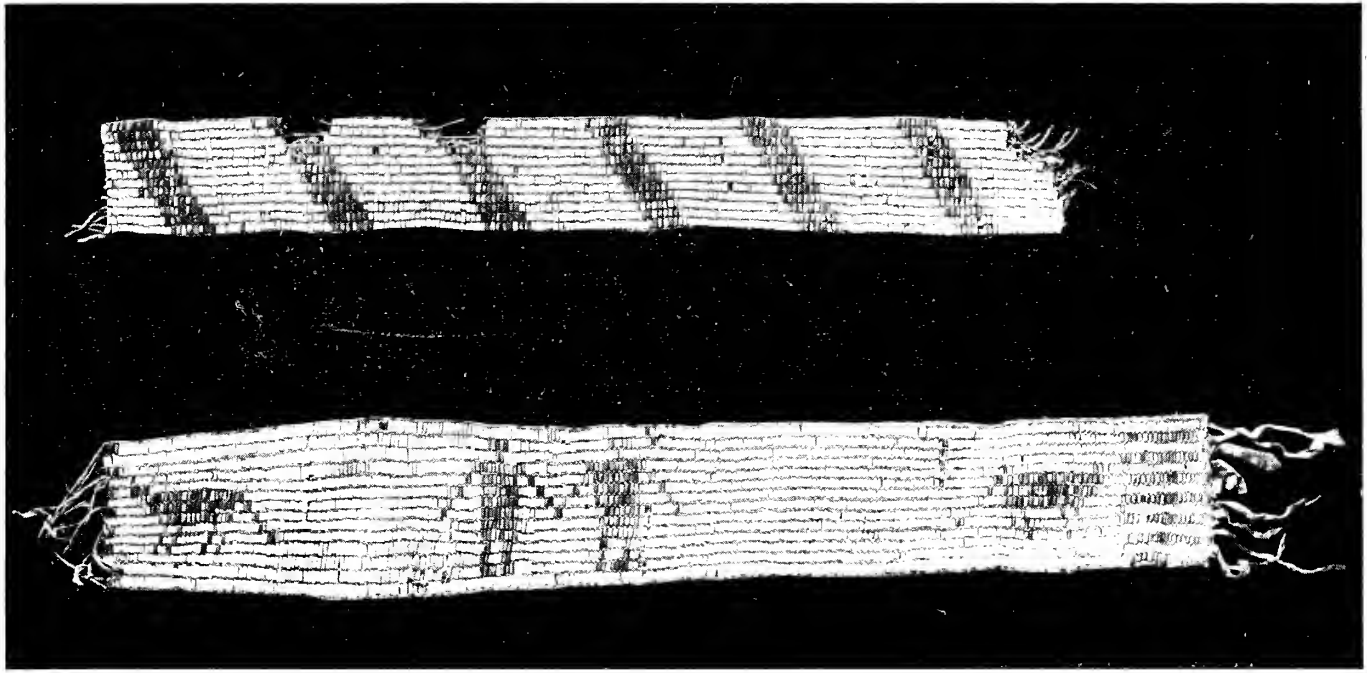

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FIGURE 36 Alliance Belt. Once thought to have marked the admittance of the Tuscaroras in 1713 to the League of the Five Nations. It, however, originally contained seven diagonal bars instead of six.

FIGURE 37 Wolf Belt. A Mohawk National Belt. The white background and central figures denote peace and friendship; guarded by wolves at either end.

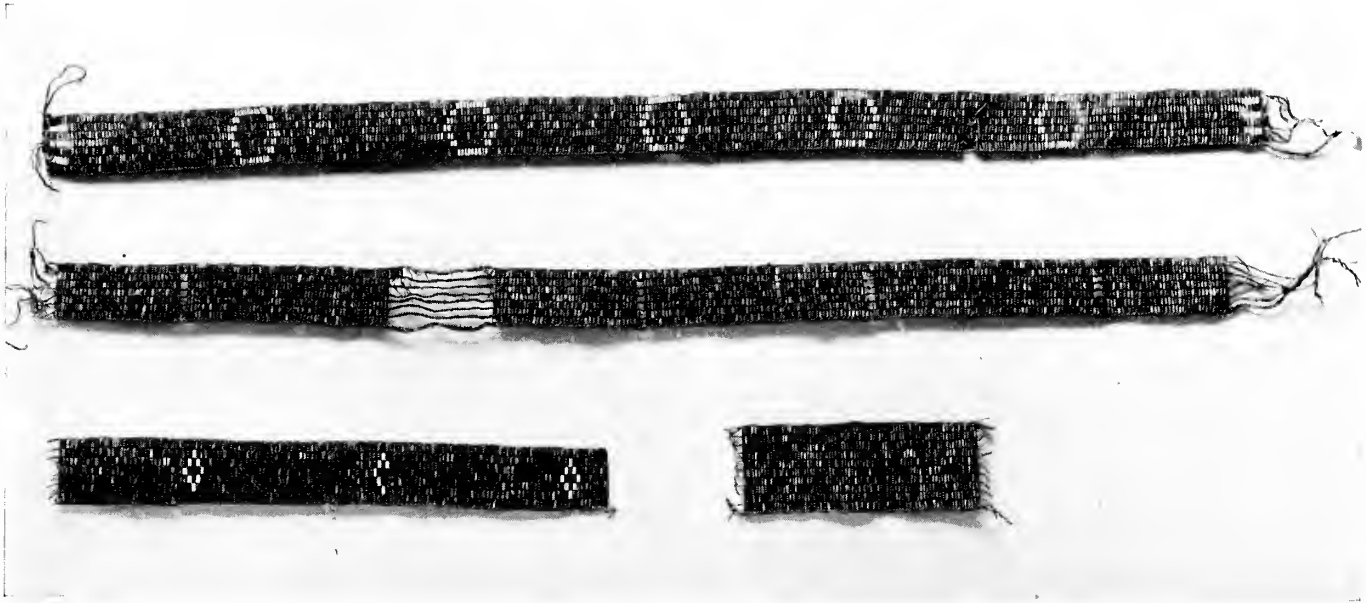


FIGURE 38 Five Nations Alliance Belt. Said to have been in the custody of Mary Jemison (the white captive of the Senecas). Originally had five diamond-shaped figures and possibly divided because of the nonagreement of two nations at a council meeting.

FIGURE 39 Gyantwaka Treaty Belt. A portion of a much longer belt which was given to the Seneca chief Cornplanter, when the treaty of the Cornplanter Reservation was consummated.

FIGURE 40 Cornplanter Condolence Belt. Personal belt of the noted Seneca civil chief Cornplanter. Mourning was indicated by purple beads and such a belt was exhibited at ceremonial rites for deceased sachems.

FIGURE 41 General Eli S. Parker Belt. Held by the Keeper of the West Door, or Do-ne-ho-ga-wa, of the Long House.

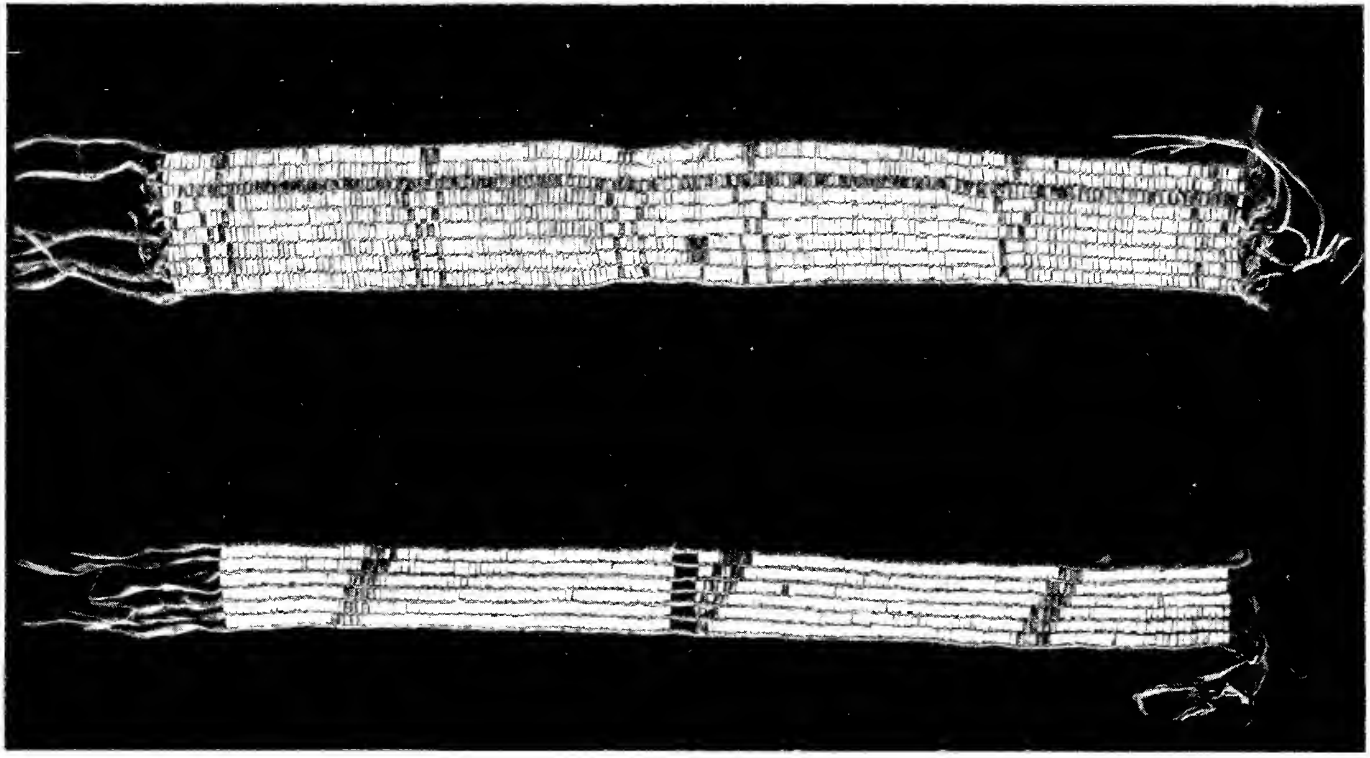

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FIGURE 42 Nomination Belt. Used by Seneca women in their power to choose, nominate and confirm the "raising up" of civil chiefs.

FIGURE 43 Hospitality, or Welcome Belt. Reputed to be a Canadian Mohawk belt used by the presiding officer in welcoming visiting delegates to the council.

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