3047
1058.13

ANNUAL REPORT

OF THE

New Jersey State Museum

INCLUDING

A LIST OF THE BIRDS, INSECTS

AND

WOOD SPECIMENS.

1902.

TRENTON, N. J. :
THE JOHN L. MURPHY PUBLISHING CO., PRINTERS.
1903.

COMPLIMENTS OF
S. R. MORSE,

New Exhibit Hall, New Jersey State Museum.
Negatives by S. R. Morse, Curator.

ANNUAL REPORT

OF THE

New Jersey State Museum

INCLUDING

A LIST OF THE BIRDS, INSECTS

AND

WOOD SPECIMENS.

1902.

TRENTON, N. J. :
THE JOHN L. MURPHY PUBLISHING CO., PRINTERS.
1903.

Right hand side of Museum from the rear of hall.

Commissioners of the New Jersey State Museum.

STATE SUPT. OF PUBLIC INSTRUCTION, CHARLES J. BAXTER. *President.*

STATE GEOLOGIST, HENRY B. KÜMMEL. *Secretary.*

PRESIDENT OF STATE BOARD OF AGRICULTURE, E. B. VOORHEES.

PRESIDENT OF THE SENATE, HON. C. ASA FRANCIS.

SPEAKER OF THE HOUSE OF ASSEMBLY, WM. J. BRADLEY,

SILAS R. MORSE, *Curator.*

Heads of the Several Departments of the New Jersey State Museum.

C. J. BAXTER, STATE SUPERINTENDENT OF PUBLIC INSTRUCTION,
Educational.

E. B. VOORHEES, RUTGERS COLLEGE, PRES'T STATE BOARD OF AGRICULTURE,
Agriculture.

HENRY B. KÜMMEL, STATE GEOLOGIST,
Geology.

JOHN C. SMOCK, EX-STATE GEOLOGIST,
Forestry.

AUSTIN C. APGAR, STATE NORMAL SCHOOL,
Birds and Botany.

JOHN B. SMITH, STATE ENTOMOLOGIST,
Entomology.

JAMES T. MORGAN, DEPUTY OF BUREAU OF LABOR STATISTICS
Manufactures.

WM. H. WERNER, *Taxidermist.*

TRENTON, N. J., November 29th, 1902.

*To the Honorable Franklin Murphy, Governor of the State of
New Jersey:*

SIR—I have the honor to present for the Commissioners the
annual report of the New Jersey State Museum.

SILAS R. MORSE,

Curator.

(5)

Natural History Exhibit in New Hall.

Report of the Curator of the New Jersey State Museum.

It is my privilege to report for the year just closed the most substantial progress in the history of the New Jersey State Museum. The Geological exhibits were installed in the new exhibit room at the close of the preceding year. Nearly all of the floor space has been filled with exhibits of general interest to the public. The Natural History exhibits, consisting of birds, nests, eggs, insects, woods, with much of the Geological and Forestry exhibit from the Buffalo and Charleston Expositions, are now installed in the new hall. Transparencies have been placed at the windows, large photographs and maps have been hung on the walls, and have added greatly to the attractiveness of the exhibit. I feel that in view of the small appropriation placed at their disposal for procuring new exhibits the Commission has cause to be well satisfied with the progress made. The large number of visitors to the Museum would indicate that the work of the Commission is much appreciated by the general public.

THE STATE EXHIBITS AT THE PAN-AMERICAN EXPOSITION, BUFFALO, 1901,

AND

AT THE SOUTH CAROLINA INTER-STATE AND WEST INDIA EXPOSITION, CHARLESTON, 1901-02.

AT THE PAN-AMERICAN, BUFFALO.

In our last report we said, "We feel proud of the part New Jersey took at the Pan-American Exposition." We are still more gratified with the success of the Educational and Forestry Exhibits at the South Carolina Inter-State and West India Exposition at Charleston. These were awarded five gold medals—one for the Educational work of the schools of the State; one for Educational Equipment and Results; one for Educational work of State Normal and Model Schools, and one for the work of the New Jersey School for the Deaf, while the Forestry Exhibit received a gold medal, a bronze medal and honorable mention. As at the World's Columbian Exposition in Chicago, 1893, where the New Jersey Educational Exhibit received the highest award, so at Buffalo it was the only State Educational Exhibit to receive a gold medal. The Geological Survey exhibit now in the Museum, received a gold medal and a silver medal. The Agricultural exhibit a gold medal and a silver medal.

We feel that the State should feel proud of the results from the exhibits at the several expositions.

The Educational and Forestry Exhibits, at the Pan-American Exposition, were sent to Charleston by special request, as the following letters will show:

PAN-AMERICAN, BUFFALO, N. Y.,
OFFICE OF
LIBERAL-ARTS DEPARTMENT,

October 22d, 1901.

New Jersey Exhibit of Public Schools, S. R. Morse, Manager, Trenton, N. J.:

DEAR SIR—The extent, excellence and success of the Educational Exhibit at Buffalo leads the managers of the Charleston Exposition to seek to give it place

Left-hand side - Geological Exhibit.

in their display. The undersigned has acceded to their request to take charge of the removal of these exhibits, and the installation of an educational exhibit in the new field. It is understood that these exhibits may not be thus transferred without special authority obtained in each case from the owners of the exhibits. You are, therefore, hereby invited to consent to such removal of your exhibit.

The Director-General of the Charleston Exposition authorizes me to say that in case you accede to this request, your exhibit will be packed, freighted to Charleston, installed, cases and fittings being furnished, cared for during the Exposition and packed and shipped at the close, all free of expense to you. The only cost will be for the return freight. As the rate of return will in almost every case be different from that by which they will reach Charleston, the railroads cannot be expected to return these exhibits free.

As the time intervening between the close at Buffalo and the opening at Charleston is very short, an *immediate* answer is earnestly requested. Please address by letter or wire.

(Signed) SELIM H. PEABODY.

*Superintendent of Liberal-Arts
Pan-American Exposition.*

Dr. David T. Day, of the Forestry and Mines Department of the Pan-American Exposition, made the same request for the New Jersey Forestry Exhibit, to be sent to the South Carolina and West India Exposition.

Mr. S. R. Morse:

DEAR SIR—Permission is very cheerfully given to remove the exhibits above referred to. The invitation is certainly very complimentary and is a just recognition of the skill and care with which the collection was gathered together. I feel justified in granting the request, under the circumstances, without legislative warrant.

I understand the same request is made as to the forestry exhibit and like consent is granted.

Yours respectfully,

(Signed) FOSTER M. VOORHEES.

October 29th, 1901.

ASSENT OF SUPERINTENDENT C. J. BAXTER,
DEPARTMENT OF PUBLIC INSTRUCTION.

I cheerfully assent to the removal of the New Jersey Educational and Forestry Exhibits from Buffalo, N. Y., to Charleston, S. C., on the conditions and for the purposes stated in the within letter of Selim H. Peabody, Superintendent of Liberal Arts at the Pan-American Exposition, and Dr. David T. Day of the Forestry and Mines department.

(Signed) C. J. BAXTER,

State Superintendent.

Trenton, N. J., October 29th, 1901.

NEW JERSEY STATE MUSEUM AT THE PAN-AMERICAN EXPOSITION.

It has been plainly shown at the Expositions held at Buffalo, in 1891, and at Charleston, in 1902, that the idea of establishing a State Museum was a wise one.

For the success of the New Jersey exhibits at Buffalo, and the part the State Museum took in them, we quote the following from the last Museum report:

THE NEW JERSEY EXHIBITS AT BUFFALO.

"We feel proud of the part New Jersey took at the Pan-American Exposition, and feel that much credit is due to the part the Museum took in aiding these exhibits. It is known that in the Museum was placed nearly all of the material from the several New Jersey State Exhibits at the World's Fair at Chicago in 1893, including all of the educational exhibit which received the highest award, the geological and agricultural exhibits, a large collection of photographs of different places in New Jersey, and the exhibits of the Women's Department and the Board of Health.

"When the request was made by the Governor and the Pan-American State Commission that an exhibit be made at Buffalo, the date was so late (March, 1901), that it would have been almost impossible to comply with the request, if the State Museum had not preserved nearly all of these exhibits, cases, cabinets, glass jars, photographs, &c., which were at Chicago.

"It may be well to state here that the manner of presenting the educational exhibits at Chicago by the Department of Public Instruction, and which was originated by it, has been adopted by all the expositions held since 1893, not only in this country but in Europe. So New Jersey has received in quite large degree the compliment of imitation.

"In making the geological exhibit at Buffalo, the State Geologist was prepared to make a first-class exhibit at short notice, for which a gold and a silver medal were awarded to that Depart-

The Art and Manual Training Department of the Educational Exhibit at the South Carolina Inter-State and West India Exposition.
Now in State Museum at Frenon.

ment. The Agricultural Department was also able to do the same, as the Museum furnished show-cases, glass jars, collections of corn, seeds, &c., large photographs, stereoscope with 100 farm views, collection of oysters and a fine collection of insects injurious to vegetation. For the New Jersey cottage it furnished some fine large New Jersey pictures; also the forestry exhibit, the first New Jersey has ever made. This contained samples of some of the woods cut so as to show the horizontal, lateral and quarter cuts with the barks, a case of sliced woods in cabinets showing between glass, the grain, growth, sap cells, &c., with several cases of insects injurious to the forests of the State; some manual training work of the public schools, large photographs of forests, with the forestry maps of the State prepared by the Geological Department, and photographs of the trees, showing them with and without foliage."

THE PAN-AMERICAN EXHIBITION.

The following State Departments made exhibits at the Pan-American Exposition, Buffalo, 1901: Geological, Educational, Museum and Agricultural. Nearly all of the exhibits, with the cabinets, tables, cases and other furniture, have been returned to the State and are now in the State Museum.

THE STATE EDUCATIONAL EXHIBIT.

The manual training work consisted of wood-turning and carving, woodwork, ironwork, sewing, mechanical drawing, &c. The academic work was such as is done by the pupils every school day, and included exercises in mathematics, grammar, geography, drawing, penmanship, language, Latin, Greek and German. There were also photographs of school buildings, and interior views showing school furniture, apparatus and classes at work. The State Normal and Model Schools furnished a large and excellent exhibit. The pupils of the State School for the Deaf prepared a fine exhibit. That of the State School for Girls consisted mainly of needlework and embroidery, which was excellent. A fine display of work was prepared by the Institution

for Feeble-Minded Women, and also by the Manual Training and Industrial School for Colored Youth. Every county in the State, and many of the cities, had work in this exhibit. It was placed in cabinets, show-cases, on the walls, and in drawers. All the cabinets, show-cases and other furniture for this exhibit were purchased by those having charge of the Educational Exhibit, and were sent with the exhibits to Charleston. These, with the exhibits, have been returned and placed in the Museum.

FORESTRY EXHIBIT.

The Forestry Exhibit at Buffalo consisted of two large plate-glass show cabinets containing sixty-five specimens of prepared woods, two swing cabinets each containing over 200 different kinds of wood, in all over 600 separate specimens. There were twelve cases of insects injurious to forests, several forestry maps, several maps of the Geological Survey, woodwork from the Manual Training Schools, a pedestal from Union Hill Manual Training School, photographs of trees, and three large photographs of forest views. All of this exhibit was sent to Charleston by special request, and is now in the State Museum at Trenton.

AGRICULTURAL EXHIBIT.

The Agricultural Exhibit at Buffalo consisted of the different agricultural products of the State, such as corn, vegetables and grasses. There were also samples of soils, 100 farm views, specimens of insects injurious to vegetation, and a series of transparencies showing progress in dairy methods and the succession of forage crops. Also maps, showing the stone roads of the State, localities where certain fruits are produced and other important matters. Large photograph views from the Museum were also shown. The beautiful hand-book of New Jersey was prepared by this Department and over 10,000 copies given to visitors. A part of this exhibit was returned to Trenton and has been placed in the Museum.

THE PAN-AMERICAN GEOLOGICAL EXHIBIT.

[From the State Geologist's Report, 1901. Henry B. Kummel, State Geologist.]

PAN-AMERICAN EXPOSITION.

On March 19th the Legislature appropriated \$25,000 for the Pan-American Commissioners. Of this sum \$4,500 were promptly voted by the Commission to the State Geologist to defray the expenses of an exhibit by the Geological Survey in the Mines Building. Application was at once made for space, but owing to the late date at which the application was received only a small fraction of what was requested could be obtained. One hundred and seventy-eight square feet were finally allotted the Survey upon the express condition that the exhibit be shipped on April 15th—in less than a month.

Under the circumstances it was not possible to make an extensive display of the mineral resources of the State, nor to add materially to the collections already in hand. The most that could be done was to select from the collections in the Museum sufficient material to fill the space available and make the best display possible. Mr. F. A. Canfield kindly consented to assume the responsibility for the exhibit of New Jersey minerals, and supplemented the Survey's collection with choice specimens of his own. It is safe to say that this part of the exhibit was not surpassed nor even equaled by that of any other State. A synoptic collection of rocks illustrating the various geologic horizons of the State, specimens of clay, marl, sand, building stones, Portland cement rock, zinc, iron, copper-ores, slate and enameled brick filled to overflowing the remaining space available for the exhibition of the mineral resources of the State. A silver medal was awarded for this exhibit.

The excellence of the various topographic, geologic and forestry maps have always given New Jersey a pre-eminent place among the States. It was fitting, therefore, that this feature of the work of the Survey should receive adequate attention. Seven relief maps or models were constructed on a large scale to show the topography and the geology of typical areas. Four of these are in the northern part and two in the southern part of the State.

They are: (1) The Palisades of the Hudson near Alpine; (2) The Terminal Moraine west of Hackettstown; (3) The Gravel Plains south of Newton; (4) The Hamburg Kame Area and Glacial Delta; (5) The Ogdensburg Drift Embankment; (6) The Area around Woodbury, Camden county, and (7) The Monmouth Shore from Sandy Hook to Asbury Park. In addition to the maps and models typical geographic views were shown by large glass transparencies placed in the windows, which together with large framed photographs added greatly to the attractiveness of the exhibit. The total cost of the models and transparencies was about 45 per cent. of the total appropriation, but this expenditure was justified in view of the subsequent educational value of these in the State Museum. A gold medal—the highest premium—was awarded the Survey for its display of maps, models and photographs in the Mines Building, and a silver medal for its display of forestry maps in the Forestry Building.

Upon the close of the Exposition, November 2d, the exhibits were packed and shipped to Trenton, where they will be added to the collection in the Museum. Although the minerals and ores of the Museum were not greatly increased by special collections made for this Exposition, yet the new relief maps and transparencies will prove a most valuable addition to the Museum. The preparation and supervision of the exhibit has demanded a large allowance of time, which was necessarily taken from the regular work of the Survey, but the renewed recognition of merit won by the Survey and the new material for the Museum have warranted this expenditure.

MUSEUM.

Early in the year the collections were moved to the room designed for them in the newly-completed addition to the State House. For a time it was necessary to use this room also as the Survey office, owing to repairs being made in the old quarters, so that for several months the Museum was closed to the public. As already noted, it was necessary to draw heavily upon the collections of the Museum for the Survey exhibit at Buffalo. For all these reasons the Museum has been for the greater portion of the year in a very incomplete state, but with the return of the collections from Buffalo much can be done towards making the

The Art and Manual Training Department of the Educational Exhibit at the South Carolina Inter-State and West India Exposition.
Now in State Museum at Trenton.

collections truly representative of the natural resources of the State. Additional cases are urgently needed in which to display the great bulk of material now in boxes in the Survey store-rooms, while the appearance of the Museum would be greatly improved and the available space would be greatly increased if the present antiquated and battered cases could be replaced by the type of case in use in modern museums.

The most available additions to the Museum during the year have been due directly or indirectly to the Pan-American Exposition. The money allotted the Survey was spent with an eye to obtaining, as far as was consistent with a successful exhibit, material of most permanent value to the Museum after the Exposition had closed. The numerous specimens of New Jersey woods, mentioned in the last Report, were cut and varnished so as best to display the natural grain. The large relief models displayed at Buffalo will add much to the value of the Museum from an educational point of view. The large glass transparencies will also contribute to a better knowledge of the surface features of the State. New specimens of building stones have been prepared and suites of specimens illustrating the concentration of zinc, iron and copper-ores obtained.

THE MUSEUM EXHIBITS.

THE EDUCATIONAL EXHIBIT.

This department contains a large and interesting exhibit of work from the public schools, the State schools and other institutions. In this section is found nearly all of the Educational Exhibits that were shown at the World's Columbian Exposition, Chicago, 1893; the exhibits shown at the Pan-American Exposition, at Buffalo, 1901, and at the South Carolina Inter-State and West India Exposition, Charleston, 1901 and 1902.

There is a fine collection of manual training work in the Museum representing nearly every public school in the State into which it has been introduced. Some of this work was shown in the special exhibit of manual training. Work was also contributed by the State Normal and Model Schools, the State School

for the Deaf, the State School for Boys, and the Newark Technical School.

The Columbian Educational Exhibit consisted of every grade of school work. It was shown in sixty-five New Jersey wing cabinets, in fifteen show-cases, on six exhibit tables, on the walls, in frames and on cards. In addition to the preceding there were 1,000 bound volumes of school work.

The Pan-American Exhibit was prepared by the schools of the State, and represents all grades of work. It is displayed as at Buffalo and at Charleston, in wing cabinets, in show-cases, on the walls and in bound volumes. These are the exhibits that received the highest awards at the two Expositions above named. They are proving of great educational value to the State, as hardly a day passes that they are not carefully inspected by pupils, teachers and other visitors. They show what New Jersey is doing, and are a source of pride to all who fully appreciate our public schools. The Pan-American Educational Exhibit is now shown in the corridor of the third story of the State House, Trenton. This exhibit was prepared in ten days, thus illustrating the actual work of our schools and also showing what they are capable of doing in an emergency.

For want of room, the Educational Exhibits from the Centennial Exposition, at Philadelphia, 1876, and the New Orleans Exposition have not been displayed, but are stored in the State Arsenal.

THE AGRICULTURAL EXHIBIT.

That part of the Pan-American Agricultural Exhibit which was returned to the Museum is to be seen in the corridor of the third story, and consists of specimens of corn and other products.

THE GEOLOGICAL EXHIBIT.

The Geological Department of the Museum contains a portion of the material collected by the Geological Survey in the course of its investigations, as well as collections obtained by purchase and those made especially for the World's Columbian Exposition and the Pan-American Exhibition. Owing to a lack of suffi-

Geological Exhibit in New Hall.
Negatives by S. R. Morse.

cient cases in which to display this material, only a portion is on exhibition, the remainder, including some very valuable material, being stored away in boxes in the basement of the State House. With new cases to replace the present antiquated ones, which date back to the Centennial Exposition, two or three times as much material could be advantageously displayed in the same space.

Although only a portion of the material on hand is on exhibition, it must not be supposed that the display is not well worthy of study. A steady and consistent effort has been put forth to make the exhibit thoroughly representative of the mineral resources of the State and distinctly educational in value. To this end, considerable sums of money have been spent from time to time in the purchase of material to fill gaps in the collections, and to pay experts for installing them.

It is not planned to give here a complete list of the geological specimens, but the following summary indicates the scope of the exhibit which is limited strictly to material found within the State. The collection consists of minerals, iron, copper and zinc-ores, rocks, clays and clay products, sands, marls, soils, building stones, well-borings, fossils, models, maps and transparencies.

Minerals.—The mineral collection includes, with one or two exceptions, specimens of all the minerals found in the State. Many of these are specimens of exceptional beauty and great value. In some cases these are of great rarity, there being but few duplicates in existence. Among the most important mineral specimens are graphite from Sussex, Passaic and Somerset counties, native copper and copper-ores from Somerset and Middlesex, native silver from Middlesex, molybdenite from Sussex, lead-ores from Sussex, zinc minerals—sphalerite, zincite, willemitite and calamine—from Sussex and Warren counties, pyrite from Middlesex, fluorite from Hudson, amethyst quartz from Passaic, opal from Passaic, corundum from Sussex. Handsome crystals of magnetite and franklinite from Sussex, limonite from Warren and Middlesex, beautiful crystals of calcite from Hudson, rhodochrosite from Sussex, magnificent specimens of pectolite from Hudson, rhodonite from Sussex, asbestos from Warren, garnets from Sussex, datolite from Hudson, prenite from Passaic,

roebbingite (extremely rare) from Sussex, tourmaline from Sussex, stilbite from Passaic and Mercer, natrolite (beautiful specimens) from Hudson, micas from Warren and Sussex, serpentine from Morris and Hudson, thauwasite from Passaic, apatite (fine crystals) from Sussex, vivianite from Gloucester and Monmouth, barite from Mercer and Union.

The mineral collection is chiefly displayed in twelve small cases in the southwest corner of the Museum. They are arranged systematically according to Dana's classification and numbered, so that ready reference may be had to Dana's *Minerology*, a copy of which is in the Museum for consultation.

Ores.—The Museum is extremely rich in its collection of iron-ores. These include specimens from all the iron-ores of the State, which have ever been producers of any importance. Since many of these mines are no longer worked, and in some cases the openings are full of water and are permanently abandoned, this collection cannot be duplicated.

The Museum also has a fine set of copper-ores, chiefly native copper from the American Copper Mine, at Somerville.

The zinc-ores from Franklin are varied and rich, and the Museum has many fine specimens, zincite, willemite and franklinite.

Rock Specimens.—The rock specimens fill four cases. These represent the various types of rock formations found in the State. The specimens are of uniform size, carefully labeled with name and locality, and are arranged systematically so as to represent in proper succession the geological structure of the State.

Clays.—The clay industry is one of great importance in the State. It is fitting, therefore, that the Geological Museum should make a good display. All the samples from important localities are on exhibition, representing the most valuable grades. With the completion of the tests of clay now being made by the Geological Survey, it will be possible to increase this exhibit greatly, *provided* cases can be had in which to display the new material.

Sands.—The glass and fire-sands of South Jersey are of great commercial importance. A fairly full series of specimens, each in a handsome glass jar, is on exhibition.

Marl.—The green sand marls of the State were formerly of great value as fertilizers, and they are still dug to a considerable

extent. Marl from all the important pits are represented in the Survey collection.

Soils.—Of late years, study of the soils has been relinquished by the Geological Survey in favor of the Agricultural Experiment Station, at New Brunswick, but many samples of various types of soil, representative of the different parts of the State, are on exhibition.

Building Stones.—The building stones of the State are shown in neatly-dressed cubes, four to eight inches square, the different sides being differently dressed to bring out different characteristics of the stone. The specimens include granite from Passaic, Sussex, Warren and Morris, marble from Sussex, Warren and Morris, limestone from Warren and Sussex, sandstones from Mercer, Hunterdon, Essex and Passaic, slate from Sussex.

Well-borings.—Artesian and deep-bored wells form the chief source of potable water for large sections of the State and numerous towns, notably along the coast, deriving their supply from them. The Survey has made careful record of many of these wells and obtained suites of specimens of the borings. A number of these, both from Northern and Southern New Jersey, have been arranged in long glass tubes on a reduced scale and placed on exhibition in the Museum. The most notable one is that of the deep well at Atlantic City, 2,306 feet from the floor of Young's Pier, the deepest boring in the State. These sections are of great value to the scientist as well as of interest to the general public.

Fossils.—Many of the geological formations, both of the northern and southern portion of the State, contain numerous fossils—the remains of the animals living at the time the rocks were formed. These are most commonly the shells or casts of the shells of the lower forms of marine life, but include also the scales, bones and teeth of fish and higher forms. The fossils on exhibition are chiefly from the clays, sands and marls of the southern part of the State. They comprise many varieties of shells, teeth of sharks, vertebrate bones of mammals, claws of crustaceans, &c. These specimens afford a fair representation of the various types of life at the different geological periods.

The Geological Survey is in possession of large collections of fossil-fish from the red sandstone formation and of old fossils

from Warren and Sussex counties, but at present is unable to display these for lack of space and cases.

Fossil Wood.—There are two excellent crase sections of white cedar that were found buried eleven feet beneath the surface in a salt marsh near Dennisville, Cape May county, and donated the exhibit by Dr. Maurice Beasley. These specimens are over three feet in diameter and are well preserved. At one time the digging out of these cedar logs in the salt swamps of Cape May county formed a valuable industry to the natives.

Models.—The large copper model of the State, on a scale of one inch per mile, which was made for exhibition at the World's Columbian Exposition, occupies a conspicuous place in the Museum and attracts much attention. It brings out more plainly than any series of maps the varied topography of the State and the contrasts between the northern and southern portion.

In addition to the large model there are several small ones, made for the Pan-American Exposition, of selected localities in the State. These models are of so much interest geologically and so important from an educational point of view that descriptions of eight of them are here given.

THE MORaine WEST OF HACKETTSTOWN.

These two models represent a small area of country on Pohatcong mountain, one mile northwest of Hackettstown, Warren county, New Jersey. The uncolored model shows without exaggeration the form of the surface; the colored model represents both the form of the surface and the geology. The northwestern portion of the area was covered by the great ice sheet of the last glacial epoch. The commingled accumulation of boulders, gravel, sand and clay, which was formed at the margin of the ice, is called the moraine. It is characterized by many sharp knolls, winding ridges and irregular depressions or kettles, some of which contain ponds or swamps. The surface is markedly rough and hummocky. The outer margin of the moraine belt is characterized by a somewhat prominent "frontal moraine ridge generally higher than the surface of the moraine behind it."

The slopes of the country southeast of the moraine are smooth and regular, very different from those of the moraine. This

contrast in topography is well shown upon the model. South-east of the moraine are areas of an earlier glacial deposit much older than the moraine. (Annual Report of the State Geologist for 1893, pp. 124-151.)

THE VICINITY OF OGDENSBURG.

These two models represent the form of the surface and the glacial deposits near Ogdensburg, Sussex county, New Jersey. A great triangular embankment of sand and gravel stretches from the mountain on the east almost across the Wallkill valley, and has turned the river out of its straight course. This embankment is followed by the railroad in its course across the valley. It is believed to be formed of the sand and gravel washed into a great crevasse in the tongue of ice, which, during the closing stages of the glacial period, occupied the valley.

Other deposits made by the water from the melting ice from irregular hillocks of sand and gravel, are called kames. The mixture of stones and clay deposited by the ice itself without the aid of running water is called till. It is often so thin that the underlying rock projects through it in numerous small outcrops. Examples of this are seen on both sides of the river in the northern part of the area represented. (See Annual Report of the State Geologist for 1894, pp. 39, 40.)

THE PALISADES OF THE HUDSON.

This model represents a portion of the Palisades of the Hudson near the New York State line. The vertical scale, feet per inch, is one and a half times the horizontal. The Palisades consists of towering vertical cliffs of hard, black rock (trap), which rise about 500 feet above the river. The rock is traversed by many vertical cracks which break it up into columnar masses. The action of the frost, roots of trees, changes of temperature and other agencies often break off great masses of the rock. The face of the cliff is, therefore, slowly wearing backward and presents the many irregularities shown in the model and the transparencies in the windows. The boulders which have been broken

from the face of the cliff have accumulated in a great steeply-sloping pile at its foot.

Here and there beneath the cliffs where the boulders are not too numerous, beds of red and gray sandstone are found, underlying the trap-rock. Since these layers dip gently westward, the trap-rock is believed to rest upon the sandstone as represented on the north and south sides of the model. On the west side of the ridge similar beds of sandstone and shale occur which apparently meet the trap-rock along a steeply-inclined contact. (Annual Report of the State Geologist for 1897, pp. 61-73.)

THE REGION SOUTH OF NEWTON.

The region south of Newton is very rocky and hilly. Hills and ledges of limestone rise abruptly from a nearly level plain, like islands in a lake. High ridges of slate border the plain on the northwest and the southeast. On the model the vertical scale has been exaggerated twice, as compared to the horizontal, in order that the relationship of hill and plain might be clearly marked. The limestone and slate-rock of the hills is partially covered by a thin layer of stony clay (till) deposited by the great ice sheet which formerly covered Northern New Jersey. The plain is composed of sand and gravel deposited by streams which issued from the glacier after its southern margin had melted back to some point north of Newton. Occasional hollows in the plain like those now occupied by Drake's, Stickle and Muckshaw ponds, probably mark the site of huge blocks of ice, which, in the melting of the glacier, became detached from the main mass and were partially or completely buried by the gravel deposits. Other ice block-holes are filled with swamps.

If the deposits made by the ice and glacial waters could be removed, the surface would be even more irregular than it is at present, for the sand and gravel deposits of the plain have partially filled deep valleys which were formerly between the rock hills. (Annual Report of the State Geologist for 1894, pp. 33-38.)

THE HAMBURG SAND-PLAIN AND KAME AREA.

These two models represent without exaggeration the form of the surface and the glacial deposits of a region southwest of Hamburg, Sussex county, New Jersey. At one stage in the melting of the great ice-sheet which formerly covered Northern New Jersey, a lake covered the southern half of this area, while the ice covered the northern portion. Streams flowing both from beneath and on top of the ice, deposited their load of gravel and sand in the lake and built a broad, flat-topped delta plain, with steep slopes and lobate front. The top of the plain represents the surface level of the lake. Beneath the edge of the ice, which at this time stood at the north margin of the plain, the streams were also depositing sand and gravel in the caverns, tunnels and other irregular openings in the marginal portion of the glacier. These gravel hills are called kames. Their irregular hummocky surface is in marked contrast to the flat-top of the delta. Some of the kames south of Hamburg form hills over 100 feet high and are the largest in the State.

Besides the deposits made by the water from the melting ice, the glacier itself deposited a sheet of bowldery, stony clay (till) of variable thickness over the surface. The underlying rock frequently projects through the coating of till. East of Franklin there is an elongate, oval-shaped hill apparently entirely of till. This is called a *drunlin*.

Maps.—On the walls of the Museum are copies of many old and rare maps of the State, as well as some of recent date issued by the Survey. One of these latter, the Forestry Map, shows accurately the distribution of the timber lands of the State.

Transparencies.—Several transparencies representing choice bits of scenery of the State adorn the windows. These were formerly on exhibition at Buffalo.

MANUAL TRAINING EXHIBIT.

LIST OF MANUAL TRAINING SCHOOLS RECEIVING AID FROM THE STATE IN 1901.

Those marked with an "x" have sent specimens of work to the State Museum and for the Educational Exhibits.

	<i>Amount received from State yearly.</i>
x Asbury Park.....Fred. S. Sheppard, Superintendent.....	\$1,000 00
x Atlantic City.....Chas. B. Boyer, Supervising Principal.....	2,000 00
x Camden.....James E. Bryan, Superintendent.....	5,000 00
x Cape May.....F. H. Hain, Supervising Principal.....	500 00
Carlstadt.....Philip Sheridan, D. C.....	600 00
x East Orange.....Vernon L. Davey, Superintendent.....	2,250 00
x Garfield.....T. C. Morrison, D. C.....	500 00
x Hoboken.....A. J. Demarest, Superintendent.....	5,000 00
Lakewood.....Jos. Johnson, D. C.....	500 00
x Montclair.....Randall Spaulding, Superintendent.....	3,750 00
x Newark.....A. B. Poland, Superintendent.....	5,000 00
North Plainfield..H. J. Wightsman, Superintendent.....	2,500 00
x Orange.....W. M. Swingle, Superintendent.....	2,600 00
x Passaic.....F. E. Spaulding, Superintendent.....	2,000 00
x Paterson.....L. A. Goodenough.....	
x Red Bank.....S. V. Arrowsmith, Supervising Principal.....	500 00
x Ridgewood.....B. C. Worster, Supervising Principal.....	600 00
x South Orange.....Jl. W. Foster, Supervising Principal.....	1,000 00
Trenton.....C. B. Gregory, Supervising Principal.....	6,618 03
x Town of Union...Otto Ortel, Superintendent.....	1,190 00
x Vineland (none the past two years), J. J. Unger, Supervising Prin.,	500 00
x Newark Technical School, Chas. A. Collen, Director.....	5,000 00
State Manual Training and Industrial School for Colored Youth, Bordentown. No special amount for manual training.	

There are specimens of work in the Museum done by the pupils in each of the above schools marked with a star. It will be found in the Educational Department of the Museum on the third floor of the State House, in the corridor and in two side rooms in the central part of the building.

Blue Jays, Nest and Eggs in Globe No. 49.

BIRDS OF NEW JERSEY.

The following list of the birds in the State Museum gives the common and scientific name of each specimen, the check number as found in Stone's Birds of Pennsylvania and New Jersey, and the number of the case or the globe in which they are exhibited. Only the birds that have been or are found in New Jersey are intended to be included in this list. Specimens are constantly being added to the collection. The Commission will be pleased to receive good specimens of birds common to New Jersey which are not included in this list, and they will pay a reasonable price for such specimens. Persons donating specimens to the Museum will be given due credit for their generosity.

The Commission desires to secure a full collection of the birds common to the State as soon as possible, and all assistance that may be given will be greatly appreciated. The Commissioners and the Curator feel that the citizens of the State should take an interest in securing a complete collection of birds common to the State and also that they create a love for our bird friends that their number may increase.

GREBES, LOONS AND AUKS.

In Case No. 8.

2. Horned Grebe. M. *Colymbus auritus* (Linn.)
4. Loon or Great Northern Diver. M.F.E. *Urinator imber* (Gunn.)
5. Red-throated Loon. 2 M.F. *Urinator lumme* (Gunn.)
8. Brunnich's Murre. M.F. *Uria lomvia* (Linn.)
12. Parasitic Jaeger. M.F. *Stercorarius parasiticus* (Linn.)

GULLS AND TERNS.

In Case No. 1.

13. Kittiwake. 2 M.F. *Rissa tridactyla* (Linn.)
14. Black-backed Gull. F. *Larus marinus* (Linn.)
15. Herring Gull. 2 M.F.E. *Larus argentatus smithsonianus* (Coues.)
17. Laughing Gull. Black head. M.F.E. *Larus atricilla* (Linn.)
18. Bonaparte's Gull. M.F. *Larus philadelphia* (Ord.)
25. Common Tern. M.F. *Sterna hirundo* (Linn.)

GANNETS.

Case No. 4.

38. Gannet (2 specimens—young). *Sula bassana* (Linn.)

DUCKS AND GEESE.

Case No. 4.

43. American Merganser. Sheldrake. 2 M.F. *Merganser americanus* (Cass.)
 45. Hooded Merganser. M.F. *Lophodytes cucullatus* (Linn.)
 46. Mallard. M.F.E. *Anas boschus* (Linn.)
 47. Black Duck. F. and White Albina (only specimen). *Anas obscura* (Gmel.)
 50. Baldpate. American Widgeon. One. *Anas americana* (Gmel.)
 51. Green-winged Teal. M.F. *Anas carolinensis* (Gmel.)
 52. Blue-winged Teal. M.F. *Anas discors* (Linn.)
 53. Shoveller. One. *Spatula clypeata* (Linn.)
 54. Pintail. One. *Dafla acuta* (Linn.)
 55. Wood Duck. Summer Duck. 2 M.F. *Aix sponsa* (Linn.)
 56. Redhead. M. *Aythya americana* (Eyt.)
 58. Bluebill or Greater Scaup. M.F. *Aythya morila nearctica* (Stejn.)
 61. Golden Eye or Whistler. One. *Glaucionetta clangula americana* (Bonap.)
 63. Old-squaw or Longtail. M.F. *Clangula hyemalis* (Linn.)
 69. White-winged Scoter. M.F. *Oidemia deglandi* (Bonap.)
 70. Surf Scoter. M.F. *Oidemia perspicillata* (Linn.)
 71. Ruddy Duck. One. *Erismatura rubida* (Wils.)
 76. Canada Goose. M.F.E. *Branta canadensis* (Linn.)
 77. Brant. One. *Branta bernicla* (Linn.)

HERONS AND BITTERNS.

Cases Nos. 3 and 1.

84. Bittern. 2 M.F.E. *Botaurus lentiginosus* (Montag.)
 85. Least Bittern. 2 M.F.E. *Ardetta exilis* (Gmel.)
 86. Great Blue Heron. M.F.E. *Ardea herodias* (Linn.)
 88. Snowy Heron. M.F.E. *Ardea candidissima* (Gmel.)
 90. Little Blue Heron. M.E. *Ardea coccyula* (Linn.)
 91. Green Heron. M.F.E. *Ardea virescens* (Linn.)
 92. Night Heron. One. *Nycticorax nycticorax nocivus* (Bodd.)
 93. Yellow-crowned Night Heron. *Nycticorax violaceus* (Linn.)

Sparrow Hawks, Nest and Young in Globe No. 8.

RAILS AND COOTS.

Case No. 1.

- 95. King Rail. 2 M.F.E. *Rallus elegans* (Aud.)
- 96. Clapper Rail or Mud-hen. M.F.N.E. *Rallus crepitans* (Gmel.)
- 97. Virginia Rail. M.F.E. *Rallus virginianus* (Linn.)
- 98. Sora. Carolina Rail. 6 M.F.E. *Porzana carolina* (Linn.)
- 102. Purple Gallinule. M.F.N.E. *Ionornis martinica* (Linn.)
- 103. Florida Gallinule. M.F.Y. *Gallinula galeata* (Licht.)
- 104. Coot. M.F.E. *Fulica americana* (Gmel.)

SNIFE AND SANDPIPERS.

Case No. 5.

- 111. American Woodcock. 2 M.F. (also globe). *Philohelo minor* (Gmel.)
- 112. Wilson's Snipe. M.F. (under globe). See No. 6. *Gollinago delicata* (Ord.)
- 113. Dowitcher. M.F. *Macrorhamphus griscus* (Gmel.)
- 114. Long-billed Dowitcher. M. *Macrorhamphus scolopaccus* (Say.)
- 115. Stilt Sandpiper. M.F. *Micropalama himantopus* (Bonap.)
- 116. Robin Snipe. M.F. (under globe No. 41). *Tringa canutus* (Linn.)
- 120. Least Sandpiper. M.F. (under globe No. 63). *Tringa minutilla* (Vieill.)
- 121. Winter Snipe or Red-backed Sandpiper. M.F. *Tringa alpina pacifica* (Coues.)
- 122. Curlew Sandpiper. M. *Tringa ferruginca* (Brunn.)
- 123. Semipalmated Sandpiper. M. *Ereunetes pusillus* (Linn.)
- 125. Sanderling or Snowy Plover. M.F. *Colidris arcuaria* (Linn.)
- 127. Hudsonian Godwit. One. *Limosa hemastica* (Linn.)
- 128. Greater Yellow-legs. M.F. *Totanus melanoleucus* (Gmel.)
- 129. Summer Yellow-legs. M.F. *Totanus flavipes* (Gmel.)
- 131. Willet. M.F. *Symphemio semipalmata* (Gmel.)
- 132. Field Plover, Grass Plover or Bartramian Sandpiper. M.F. (under globe No. 23). *Bartromia longicauda* (Bechst.)
- 136. Hudsonian Curlew. M.F. (under globe No. 30). *Numenius hudsonicus* (Lath.)

PLOVERS.

Case No. 5.

- 138. Black-bellied Plover. M.F. *Charadrius squatarola* (Linn.)
- 139. Golden Plover. M. *Charadrius dominicus* (Mull.)
- 140. Killdeer. M.F. young (under globe No. 28). *Aegialitis vocifera* (Linn.)
- 141. Semipalmated Plover. M.F. (under globe No. 11). *Aegialitis semipalmata* (Bonap.)
- 144. Wilson's Plover. M.F. *Aegialitis wilsonia* (Ord.)

TURNSTONES.

Case No. 5.

145. Turnstone or Calico-back. 2 M.F. *Arenaria interpres* (Linn.)

GROUSE, QUAIL, ETC.

Case No. 8.

147. Bob White. Partridge (a covey of 6 under globe No. 4). M.F.N.E.
Colinus virginianus (Linn.)
148. Ruffed Grouse or Pheasant. 2 M.F.E. *Bonasa umbellus* (Linn.)
150. Wild Turkey. F.E. *Meleagris gallopavo* (Linn.)
Ring-necked Pheasant. 2 M.F. and 4 young.
Spruce Partridge or Canada Grouse. M.F. *Dendragapus canadensis*.
153. Ground Dove. One. *Columbigallina passerina terrestris* (Chapm.)

VULTURE, HAWKS AND EAGLES.

Case No. 3.

154. Turkey Vulture. M.E.E. *Cathartes aura* (Linn.)
156. Marsh Hawk. 2 M.F. *Circus hudsonius* (Linn.)
157. Sharp-shinned Hawk. M. *Accipiter velox* (Wils.)
159. American Goshawk. M. *Accipiter atricapillus* (Wils.)
160. Red-tailed Hawk. M. *Buteo borealis* (Gmel.)
162. Red-shouldered Hawk. M.F. 2 young. *Buteo lineatus* (Gmel.)
166. Bald Eagle. M. (young, 2 years old). *Haliaeetus leucoccephalus* (Linn.)
167. Duck Hawk. M. *Falco peregrinus anatum* (Bonap.)
168. Pigeon Hawk. *Falco columbarius* (Linn.)
169. Sparrow Hawk. M.F.N. 4 young (see globe No. 8). *Falco sparverius* (Linn.)
170. Osprey. Fish Hawk. M.F.E. *Pandion haliaetus carolinensis* (Gmel.)

OWLS.

Case No. 6.

171. Bar Owl. M.F.E. *Stria pratensis* (Bonap.)
172. Long-eared Owl. M.F. *Asio wilsonianus* (Less.)
173. Short-eared Owl. M.F. *Asio accipitrinus* (Pall.)
177. Screech Owl. 2 M.F.N. 3 Y.E. (in globe No. 43). *Megascops asio* (Linn.)
178. Great Horned Owl. M.F. *Bubo virginianum* (Gmel.)
179. Snowy Owl. M.F. *Nyctea nyctea* (Linn.)
180. American Hawk Owl. M. *Surnia ulula caparoch* (Mull.)
183. Yellow-billed Cuckoo. M.N.E. (globe No. 45). *Coccyzus americanus* (Linn.)
184. Black-billed Cuckoo. M.N.E. (globe No. 44). *Coccyzus erythrophthalmus* (Wils.)

FROM COL. CHI. ACAD. SCIENCES.

PROTHONOTARY WARBLER.

COPYRIGHT 1905, BY A. W. MURPHY

KINGFISHERS. WOODPECKERS.

Case No. 5.

- 185. Belted Kingfisher. M.F.E. *Ceryle alcyon* (Linn.)
- 186. Hairy Woodpecker. M.F. *Dryobates villosus* (Linn.)
- 187. Downy Woodpecker. M.F. (in globe No. 5). *Dryobates pubescens* (Linn.)
- 190. Pileated Woodpecker. One M. *Ceophlæus pilcatus* (Linn.)
- 191. Red-headed Woodpecker. M.F.E.N. *Melanerpes erythrocephalus* (Linn.)
- 193. Flicker. Golden-winged, &c. M.F.E.N. *Colaptes auratus* (Linn.)

SWIFTS.

Case No. 6.

- 197. Chimney Swift. 2 M., 2 F. (also in globe No. 32). *Chaetura pelagica* (Linn.)
- 198. Ruby-throated Hummingbird. 2 M.F., 2 N.E. *Trochilus colubris* (Linn.)

FLYCATCHERS.

- 201. Kingbird. M.F.M.E. (under shade No. 18). *Tyrannus tyrannus* (Linn.)
- 203. Crested Flycatcher. *Myiarchus crinitus* (Linn.)
- 204. Pewee. Phoebe. M.F.N.E. (under globe No. 30). *Sayornis phæbe* (Lath.)
- 205. Olive-sided Flycatcher. M. *Contopus borealis* (Swains.)
- 206. Wood Pewee. M.F. *Contopus virens* (Linn.)

LARKS.

Case No. 1.

- 211. Horned Lark. 2 M., 2 F. (in globe No. 12). *Otocoris alpestris* (Linn.)

CROWS.

- 213. Blue Jay. M.F.N.E. (in globe No. 49). *Cyanocitta cristates* (Linn.)
- 216. American Crow. M.F.E. *Corvus americanus* (Aud.)
- 217. Fish Crow. M.F.E. *Corvus ossifragus* (Wils.)

ORIOLES.

Case No. 5.

- 218. Bobolink or Reedbird. 3 M.F.N.E. (under globe No. 50). *Dolichonyx oryzivorus* (Linn.)
- 219. Cowbird. M.E.E. *Molothrus ater* (Bodd.)
- 220. Yellow-headed Blackbird. M.F. *Xanthocephalus xanthocephalus* (Bonap.)

30 REPORT OF NEW JERSEY STATE MUSEUM.

221. Red-winged Blackbird. M.F.N.E. (in globe No. 50). *Agelaius phœniceus* (Linn.)
222. Meadow Lark. M.F. (also in globe No. 19). *Sturnella magna* (Linn.)
223. Orchard Oriole. M.F.E. *Icterus spurius* (Linn.)
224. Baltimore Oriole. M.F.N.E. (in globe No. 10). *Icterus galbula* (Linn.)
225. Rusty Blackbird. M.F.E. *Scolecophagus carolinus* (Mull.)
226. Purple Grackle. M.F.N.E. *Quiscalus quiscula* (Linn.)

FINCHES.

230. Pine Grosbeak. 1 M., 2 F. (in globe No. 56). *Pinicola enucleator* (Linn.)
231. Purple Finch. M.F.N.E. (in globe No. 52). *Carpodacus purpurceus* (Gmel.)
232. American Crossbill. 3 M.F. (in globe No. 57). *Loxia curvirostra minor* (Brehm.)
233. White-winged Crossbill. 1 M., 2 F. (in globe No. 58). *Loxia leucoptera* (Gmel.)
234. Redpoll. M. *Acanthis linaria* (Linn.)
235. Goldfinch. M.F.N.E. (in globe No. 54). *Spinus tristis* (Linn.)
236. Pine Finch. M. *Spinus pinus* (Wils.)
239. Vesper Sparrow, Grass Finch or Bay-winged Bunting. M.F. *Pooecetes gramineus* (Gmel.)
241. Savanna Sparrow. One. *Ammodramus sandwichensis savanna* (Wils.)
244. Sharp-tailed Sparrow. M.F. *Ammodramus caudacutus* (Gmel.)
245. Acadian Sharp-tailed Sparrow. *Ammodramus caudacutus subvirgatus* (Dwight.)
247. Seaside Sparrow. M.F.N.E. (in globe No. 25). *Ammodramus maritimus* (Wils.)
248. Lark Sparrow. M.F. *Chondestes grammacus* (Say.)
249. White-crowned Sparrow. M. *Zonotrichia leucophrys* (Forst.)
250. White-throated Sparrow. M.F.N.E. (in globe No. 25). *Zonotrichia albicollis* (Gmel.)
251. Tree Sparrow. M.F.N.E. (in globe No. 39). *Spizella monticola* (Gmel.)
252. Chipping Sparrow. M.F.N.E. (in globe No. 13). *Spizella socialis* (Wils.)
253. Field Sparrow. M.F.N.E. *Spizella pusilla* (Wils.)
254. Snowbird. M.F.N.E. *Junco hyemalis* (Linn.)
255. Song Sparrow. M.N.E. *Melospiza fasciata* (Gmel.)
256. Lincoln's Sparrow. M.F.N.E. *Melospiza lincolina* (Aud.)
257. Swamp Sparrow. M.N.E. *Melospiza georgiana* (Lath.)
258. Fox Sparrow. M.F. *Passercilla iliaca* (Merr.)
259. Chewink or Towhee. 2 M.F.M.E. *Pipilo erythrophthalmus* (Linn.)
260. Cardinal. M.F.N.E. (in globe No. 47). *Cardinalis cardinalis* (Linn.)
261. Rose-breasted Grosbeak. M.F. (in globe No. —). *Habia ludoviciana* (Linn.)
263. Indigo Bird. M.F.N.E. (in globe No. 21). *Passerina cyanea* (Linn.)
- Backman's Sparrow. One.

TANAGERS.

265. Scarlet Tanager. M.F.N.E. (in globe No. 24). *Piranga erythromelas* (Vieill.)
266. Summer Tanager. M. *Piranga rubra* (Linn.)

Group of Screech Owls under Globe No. 43.

SWALLOWS.

268. Cliff or Eve Swallow. M.F.N.E. (in globe No. 33). *Petrochelidon lunifrons* (Say.)
 269. Barn Swallow. M.F.N.E. (in globe No. 34). *Chelidon erythrogaster* (Bodd.)
 270. Tree or White-bellied Swallow. M.F.N.E. (in globe No. 35). *Tachycineta bicolor* (Vieill.)

WAXWINGS.

273. Bohemian Waxwing. M.F. *Ampelis garrulus* (Linn.)
 274. Cedar Waxwing. M.F.N.E. *Ampelis cedrorum* (Vieill.)

SHRIKES.

275. Northern Shrike. M.F.N.E. (in globe No. 7). *Lanius borealis* (Vieill.)
 276. Loggerhead Shrike. M. *Lanius ludovicianus* (Linn.)

VIREOS.

277. Red-eyed Vireo. M.F.N.E. *Virco olivaceus* (Linn.)
 279. Warbling Vireo. *Virco gilvus* (Vieill.)
 280. Yellow-throated Vireo. *Virco flavifrons* (Vieill.)

WARBLERS.

283. Black and White Warbler. M. *Mniotilta varia* (Linn.)
 284. Protonotary Warbler. M. *Protonotaria citrea* (Bodd.)
 285. Worm-eating Warbler. M.F. *Helminthecus vermivorus* (Gmel.)
 286. Blue-winged Warbler. One. *Helminthophila pinus* (Linn.)
 290. Nashville Warbler. One. *Helminthophila ruficapilla* (Wils.)
 292. Tennessee Warbler. One. *Helminthophila peregrina* (Wils.)
 293. Parula Warbler. M.F.N.E. (in globe No. —). *Compsothlypis americana* (Linn.)
 294. Cape May Warbler. One. *Dendroica tigrina* (Gmel.)
 295. Yellow Warbler. M. *Dendroica aestiva* (Gmel.)
 296. Black-throated Blue Warbler. F. *Dendroica caerulescens* (Gmel.)
 297. Myrtle or Yellow-rumped Warbler. M.F. *Dendroica coronata* (Linn.)
 298. Audubon's Warbler. *Dendroica auduboni* (Townsend.)
 299. Magnolia or Black and Yellow Warbler. One. *Dendroica maculosa* (Gmel.)
 301. Chestnut-sided Warbler. M.F.E. (in globe No. 53). *Dendroica pensylvanica* (Linn.)
 302. Bay-breasted Warbler. One. *Dendroica castanea* (Wils.)
 303. Black-poll Warbler. One. *Dendroica striata* (Forst.)
 304. Blackburnian Warbler. M. *Dendroica blackburniae* (Gmel.)
 305. Yellow-throated Warbler. 2 M., 2 F. (in globe No. —). *Dendroica dominica* (Linn.)
 306. Black-throated Green Warbler. M.F. *Dendroica virens* (Gmel.)
 308. Pine Warbler. One. *Dendroica vigosii* (Aud.)
 312. Water Thrush. One. *Sciurus noveboracensis* (Gmel.)

32 REPORT OF NEW JERSEY STATE MUSEUM.

315. Kentucky Warbler. *Geothlypis formosa* (Wils.)
 317. Mourning Warbler. F. *Geothlypis philadelphia* (Wils.)
 318. Maryland Yellow Throat. M.F.N.E. and Y. (in globe No. 31). *Geothlypis trichas* (Linn.)
 319. Yellow-breasted Chat. M.F.N.E. (in globe No. 37). *Icteria virens* (Linn.)
 320. Hooded Warbler. One. *Sylvania atrata* (Gmel.)
 321. Wilson's Warbler. *Sylvania pusilla* (Wils.)
 322. Canadian Warbler. M. *Sylvania canadensis* (Linn.)
 323. Redstart. M.F.N.E. (in globe No. 48). *Setophaga ruticilla* (Linn.)

WRENS.

325. Mockingbird. M.N.E. (in globe No. —). *Mimus polyglottos* (Linn.)
 326. Catbird. M.F.N.E. (in globe No. 26). *Galeoscoptes carolinensis* (Linn.)
 327. Brown Thrasher. M.F.N.E. (in globe No. 31). *Harporhynchus rufus* (Linn.)
 333. Long-billed Marsh Wren. M.F.N.E. *Cistothorus palustris* (Wils.)

CREEPERS.

334. Brown Creeper. M.F. *Certhia familiaris americana* (Bonap.)

TITMICE AND NUTHATCHES.

335. White-breasted Nuthatch. *Sitta carolinensis* (Lath.)
 336. Red-breasted Nuthatch. *Sitta canadensis* (Linn.)
 338. Tufted Titmouse or Crested Tit. M.F. *Parus bicolor* (Linn.)
 339. Black-capped Chickadee. M.F.N.E. (in globe No. —). *Parus atricapillus* (Linn.)

OLD WORLD WARBLERS.

341. Golden-crowned Kinglet. One. *Regulus satrapa* (Licht.)
 342. Ruby-crowned Kinglet. M. *Regulus calendula* (Linn.)

THRUSHES.

344. Wood Thrush. One. *Turdus mustelinus* (Gmel.)
 345. Wilson's Thrush or Veery. M.F. (in globe No. 1). *Turdus fuscescens* (Steph.)
 348. Olive-backed Thrush (in globe No. 38). *Turdus ustulatus swainsonii* (Cab.)
 349. Hermit Thrush. *Turdus aonalaschke pallasii* (Cab.)
 350. Robin. M.F.N.E. (in globe No. 36). *Merula migratoria* (Linn.)
 352. Bluebird. M.F.N.E. (in globe No. 20). *Sialia sialis* (Linn.)

LIST OF BIRDS UNDER GLASS GLOBES.

Abbreviations used.—F., female; M., male; N., nest; E., eggs;
Y., young.

No.		
1.	Wilson's Thrush	M.F.N.E. <i>Turdus fuscescens</i> (Steph.)
2.	Black-capped Chickadee	M.F.N.E. <i>Parus atricapillus</i> (Linn.)
3.	Brown Thrasher	M.F.N.E. <i>Harporhynchus rufus</i> (Linn.)
4.	Quail—Bob White, Partridge	M.F.N.E. <i>Colinus virginianus</i> (Linn.)
5.	Downy Woodpecker	M.F.N.E. <i>Dryobates pubescens</i> (Linn.)
6.	Wilson's Snipe	M.F.N. <i>Gallinago delicata</i> (Ord.)
7.	Northern Shrike	M.F.N. <i>Lanius borealis</i> (Vieill.)
8.	Sparrow Hawk	M.F.N. 4 Y. <i>Falco sparverius</i> (Linn.)
9.	Summer Yellow Bird or Golden Warbler	M.F.N.E. <i>Dendroica aestiva</i> (Gmel.)
10.	Baltimore Oriole	M.F.N.E. <i>Icterus galbula</i> (Linn.)
11.	Semipalmated Plover	M.F. <i>Actialitis semipalmata</i> (Bonap.)
12.	Lark Bunting	M.F. <i>Capamospiza melanocorys</i> .
13.	Chipping Sparrow	M.F.E. <i>Spizella socialis</i> (Wils.)
14.	Lincoln's Sparrow	M.F.N.E. <i>Melospiza lincolni</i> (Aud.)
15.	Semipalmated Sandpiper	M. <i>Eruncetes pusillus</i> (Linn.)
16.	Virginia Rail	M.F.N.E. <i>Rallus virginianus</i> (Linn.)
17.	Woodcock (American)	M.F.N.E. <i>Philohela minor</i> (Gmel.)
18.	Kingbird, bee eater	M.F.N.E. <i>Tyrannus tyrannus</i> (Linn.)
19.	Meadow Lark	M.F.N.E. <i>Sturnella magna</i> (Linn.)
20.	Blue Bird	M.F.N.E. <i>Sialia sialis</i> (Linn.)
21.	Indigo Bird	M.F.N.E. <i>Passerina cyanea</i> (Linn.)
22.	Rose-breasted Grosbeak	M.F.N.E. <i>Habia ludoriciana</i> (Linn.)
23.	Bartramian Sandpiper, Field Plover	M.F.N.E. <i>Bartramia longicauda</i> (Bechst.)
24.	Scarlet Tanager	M.F.N.E. <i>Piranga erythromelas</i> (Vieill.)
25.	Seaside Sparrow	M.F.N.E. <i>Ammodramus maritimus</i> (Wils.)
26.	Catbird	M.F.N.E. <i>Galcoscoptes carolinensis</i> (Linn.)
27.	Parula Warbler	M.F.N.E. <i>Compsothlypis americana</i> (Linn.)
28.	Killdeer Plover	M.F.N.E. 4 Y. <i>Actialitis vocifera</i> (Linn.)
29.	Pewee, Phoebe	M.F.N.E. <i>Sayornis phoebe</i> (Lath.)
30.	Hudsonian Curlew	M. <i>Numenius hudsonicus</i> (Lath.)
31.	Maryland Yellowthroat	M.F.N.E. <i>Geothlypis trichas</i> (Linn.)
32.	Chimney Swift	M.F.N.E. <i>Chatura pelagica</i> (Linn.)
33.	Cliff or Eve Swallow	M.F.N.E. <i>Petrochelidon lunifrons</i> (Say.)
34.	Barn Swallow	M.N.E. <i>Chelidon erythrogaster</i> (Bodd.)
35.	Tree or White-bellied Swallow	M.F.N.E. <i>Tachycineta bicolor</i> (Vieill.)
36.	Robin	M.F.N.E. <i>Merula migratoria</i> (Linn.)
37.	Yellow-breasted Chat	M.F.N.E. <i>Icterus virens</i> (Linn.)
38.	Olive-breasted Thrush	M.F. <i>Turdus swainsonii</i> (Cab.)
39.	Tree Sparrow	M.F.N.E. <i>Spizella monticola</i> (Gmel.)
40.	Yellow-bellied Sapsucker	M.N. <i>Sphyrapicus varius</i> (Linn.)
41.	Robin Snipe	M.F.N. <i>Tringa canutus</i> (Linn.)
42.	Summer Yellow-legs	M.F. <i>Totanus flavipes</i> (Gmel.)
43.	Screech Owls	M.F.N. 3 Y. <i>Megascops asio</i> (Linn.)
44.	Black-billed Cuckoo	M.N.E. <i>Coccyzus erythrophthalmus</i> (Wils.)

45. Yellow-billed Cuckoo	M.N.E.	<i>Coccyzus americanus</i> (Linn.)
46. Mockingbird	M.N.E.	<i>Mimus polyglottos</i> (Linn.)
47. Cardinal	M.F.N.E.	<i>Cardinalis cardinalis</i> (Linn.)
48. Redstart	M.F.N.E.	<i>Setophaga ruticilla</i> (Linn.)
49. Blue Jay	M.F.N.E.	<i>Cyanocitta cristata</i> (Linn.)
50. Red-winged Blackbird	M.F.N.E.	<i>Agelaius phoeniceus</i> (Linn.)
51. Bobolink, Reed or Ricebird	M.F.N.E.	<i>Dolichonyx oryzivorus</i> (Linn.)
52. Purple Finch	M.F.N.E.	<i>Carpodacus purpureus</i> (Gmel.)
53. Chestnut-sided Warbler	M.N.E.	<i>Dendroica pensylvanica</i> (Linn.)
54. American Goldfinch	M.F.N.E.	<i>Spinus tristis</i> (Linn.)
55. English Sparrow	M.F.N.E.	<i>Passer domesticus</i> .
56. Pine Grosbeak	M.F.N.E.	<i>Pinicola enucleator</i> (Linn.)
57. American Crossbill	M.F.	<i>Loxia curvirostra minor</i> (Brehm.)
58. White-winged Crossbill	M.F.	<i>Loxia leucoptera</i> (Gmel.)
59. King Rail	M.F.	<i>Rallus elegans</i> (Aud.)
60. Summer Yellow-legs	M.F.	<i>Totanus flavipes</i> (Gmel.)
61. Snowbird	M.F.N.E.	<i>Junco hyemalis</i> (Linn.)
62. Black-billed Plover	M.F.	<i>Charadrius squatarola</i> (Linn.)
63. Turnstone—Calico-back	M.F.	<i>Arenaria interpres</i> (Linn.)
64. Red-headed Woodpecker	M.F.N.E.	<i>Melanerpes erythrocephalus</i> (Linn.)
65. Flicker or Golden-winged Wood-
pecker	M.F.N.E.	<i>Colaptes auratus</i> (Linn.)
66. Ruby-throated Hummingbird	M.F.N.E.	<i>Trochilus colubris</i> (Linn.)
67. Fox Sparrow	M.F.	<i>Passercella iliaca</i> (Merr.)
68. Bohemian Waxwing	M.F.	<i>Ampelis garrulus</i> (Linn.)
69. Cedar Waxwing	M.F.N.E.	<i>Ampelis cedrorum</i> (Vieill.)
70. Loggerhead Shrike	M.F.	<i>Lanius ludovicianus</i> (Linn.)
71. Long-bill Marsh Wren	M.F.N.E.	<i>Cistothorus palustris</i> (Wils.)
72. Red-breasted Nuthatch	M.F.N.E.	<i>Sitta pusilla</i> (Lath.)
73. Tufted Titmouse or Crested
Tit	M.F.N.E.	<i>Parus bicolor</i> (Linn.)
74. Wood or Summer Duck	2 M.	<i>Cir sponsa</i> (Linn.)
75. Bronzed Grackle	M.F.N.E.	<i>Quiscalus quiscula ateneus</i> (Widgw.)

Barn Swallows, Nest and Eggs in Globe No. 34.

Adult Male.
Larva.

LUNA MOTH.
(*Tropaea luna*.)
Pupa.
POLYPHEMUS MOTH.
(*Telea polyphemus*.)
Pupa.
Eggs on Maple Leaf.
About $\frac{1}{2}$ Life-size.

Adult Female.
Cocoon.

Adult Female.
Cocoon.

List of Insects Now in Museum.

DEAR SIR—Inclosed herewith is a catalogue of the collection prepared for the State Museum. I have retained a duplicate, so if any question arises at any time concerning any specimen, or the replacing of any specimen, it will be easy for you to designate what is needed and for me to understand what is wanted.

I send you, also, by express, two sections from an oak trunk showing work of the goat moth larva, commonly called the Carpenter worm, and also the distortions in growth produced by the presence of the insects. I trust this will reach you in time to be useful, and am

Very truly yours,

MR. SILAS R. MORSE,

State Museum, Trenton, N. J.

JOHN B. SMITH,

State Entomologist.

CATALOGUE OF COLLECTION PREPARED FOR THE NEW JERSEY STATE MUSEUM,

BY JOHN B. SMITH.

1. WORK OF SCOLYTID BEETLES IN THE BARK AND WOOD OF PITCH PINE.

Work of *Dendroctonus*, showing pitch on outer surface of bark and inner surface of bark. 2 cards.

Galleries of *Tomicus cecographus* on inner surface of bark. 3 cards.

Galleries made by *T. calligraphus*. 1 card.

Burrows made in bark by *Crypturgus alutaceus*. 1 card.

Burrows made in wood by *Gnathotrichus materarius*. 3 cards.

No specimens of beetles.

2. LIFE HISTORY OF *Attacus cecropia*.

2 males, 2 females, 2 inflated larvæ, 2 larvæ in alcohol, 2 pupæ, 2 cocoons, 1 cocoon with moth emerging, 2 cocoons cut open showing contents, 6 parasites, *Ophion macrum*, and 2 parasitized pupæ.

3. INSECTS INJURIOUS TO PINE.

Galleries made by larva of *Prionus*, sp. 2 cards.

Larval burrow and pupa chamber of *Monohammus titillator*. 2 cards.

Monohammus titillator larva and adults in alcohol. 2 vials.

Prionus, sp., larvæ in alcohol. 2 vials.

Prionus laticollis, 5 males and 1 female.

Monohammus titillator. 10 specimens.

36 REPORT OF NEW JERSEY STATE MUSEUM.

4. LIFE HISTORY OF *Samia cynthia*.

2 males, 6 females, 3 larvæ in alcohol, eggs in alcohol, 2 inflated larvæ, 2 pupæ, 2 cocoons opened, 10 sound cocoons, 1 cocoon showing moth emerging, 1 cut open showing pupa.

5. AMERICAN SILKWORMS AND THEIR MOTHS.

A. anguilfera, 2 males, 2 females, 1 inflated larva, 1 pupa shell, 3 cocoons, 1 cocoon open.

A. columbia, 2 males, 2 females, 3 cocoons.

A. promethca, 2 males, 2 females, 2 cocoons, 2 parasitized cocoons, 2 inflated larvæ, 2 larvæ in alcohol, 1 pupa.

6. *Telega polyphemus*. LIFE HISTORY.

2 males, 4 females, 2 inflated larvæ, 2 larvæ in alcohol, 5 cocoons, 2 cocoons opened to show pupa shell, 2 pupæ. 2 *Ophion macrurum*, 2 cocoons of same, 1 adult emerging from *Telega polyphemus* cocoon.

7. WORK OF BARK SLIPPERS IN OAK. *Phymatodes variabilis*.

Sections of oak cordwood showing galleries made by larvæ. 3 cards.
Oak bark separated from wood by larvæ. 1 card.

Section of young black oak showing work of larva in sap wood. 1 card.

Section of dead oak branch showing space between wood and bark. 1 card.

Section of wood showing pupal chamber. 3 cards.

Pupal chamber of *C. femorata*. 1 card.

40 specimens of *P. variabilis*, 2 vials containing the different stages of insects.

8. THE WOOD LEOPARD MOTH, *Zuzera pyrina* (F.)

Pupal cell in maple. 1 card.

Borings in maple, pupa shells projecting. 1 card.

Borings and girdlings on pear. 3 cards.

Borings and girdlings on mountain ash. 1 card.

Boring in silver sycamore maple. 1 card.

1 blown larva, 1 pupa shell, 7 males, 5 females, moths; 1 blown larva in burrow, 1 bottle larva *insitu* in maple, 1 bottle full grown larvæ and pupæ; total, 7 cards, 2 large vials on blocks, 12 moths, 2 mounted; early stages.

9. THE REGAL WALNUT MOTH, *Citheronia regalis*, AND EMPEROR MOTH, *Eacles imperialis*.

C. regalis, 3 male moths, 2 female moths, 2 inflated larvæ, 3 larvæ in alcohol, 1 pupa, 1 pupa shell.

E. imperialis, 2 male moths, 3 female moths, 3 inflated larvæ, 3 larvæ in alcohol, 1 pupa.

10. BAG WORM, *Thyridopteryx ephemeraformis*.

Female bag worms in alcohol, same broken open; full-grown larvæ in alcohol, leaves of maple eaten by bag worms, in alcohol; 1 inflated larva, 1 larva in case, 1 pupa, 7 male moths, 6 bags opened to show contents, 1 branch bearing a number of bags.

11. SWALLOW-TAILED BUTTERFLIES OF NEW JERSEY.

Papilio turnus, 1 male, 1 female; 1 female var. *glaucus* moths; 3 inflated larvæ, 3 alc. larva, vials; 1 chrysalis. 1 chrysalis with hole made by parasite; 1 *Trogus cæcorius*.

Papilio thoas, 1 male, 1 female, butterfly; 1 inflated larva, 3 alc. larvæ, in 2 vials; 1 pupa or chrysalis, 1 chrysalis shell, 1 chrysalis shell with hole made by parasite, *Trogus cæcorius*.

Papilio asterias, 1 male, 1 female, butterfly; 3 blown larvæ, 5 alc. larvæ, different stages, in 2 vials; 2 chrysalis, 1 chrysalis shell.

12. THE WOODPECKER, THE OAK AND CARPENTER WORM.

5 cards with 8 specimens, illustrating work of Woodpeckers and the efforts of the tree to repair damage. All large, fine specimens. No insects.

13. SOME COMMON SCALES FOUND IN NEW JERSEY.

Pernicious or *San Jose*, 1 picture card. On peach, 1 card; on plum, 1 card; on plums, 1 vial.

Oyster-shell Bark Louse, 1 picture card. On ash, 1 card; on butternut, 1 card; on lilac, 1 card.

Rose Scale on raspberry, 1 card.

Scurfy Scale, 1 picture card. On apple, 1 card, 2 vials.

Forbes Scale on cherry, 1 card.

14. WORK OF THE "CARPENTER WORM" OR LARVA OF THE "GOAT MOTIL."

7 male moths, 3 females; 1 inflated larva, 1 pupa shell, pupa and larvæ in alcohol, 1 vial.

Piece of oak showing burrows of larvæ. 1 card.

Section of young oak showing exit hole. 1 card.

Cross-section of white oak showing burrows. 1 card.

Section from a young white oak showing burrows and woodpecker holes. 1 card.

Sections of an oak trunk showing exit and entering hole for larvæ. 1 card.

15. SOME NEW JERSEY HAWK-MOTHS.

The Potato Hawk Moth, Protoparce cecus.

1 male, 1 female, 2 blown larvæ, 1 pupa, 1 pupa shell, larva in alcohol, 1 vial.

The Lilac Hawk-Moth, Ceratomia undulosa.

1 male, 1 female, 3 blown larvæ, 2 pupæ, 1 pupa shell, larvæ in alcohol, 1 vial.

The Tomato Hawk-Moth, Protoparce carolina.

1 male, 1 female, 3 inflated larvæ, 1 pupa, 1 pupa shell, larva in alcohol, 1 vial.

The Elm Tree Hawk-Moth, Ceratomia amyntor.

1 male, 1 female, 2 blown larvæ, 1 pupa, 1 pupa shell, larva in alcohol, 1 vial.

White-lined Hawk-Moth, Deilephila lineata.

2 males, 2 females, 3 blown larvæ, 1 pupa, 1 pupa shell, larva in alcohol, 1 vial.

38 REPORT OF NEW JERSEY STATE MUSEUM.

16. HAWK-MOTHS OF THE VINE.

Philampelus pandorus, 2 males, 2 females, 2 inflated larvæ, 2 pupæ.
Philampelus achemon, 2 males, 2 females, 2 inflated larvæ, 2 pupa shells.
Thyreus abbotii, 1 male, 1 female, 2 inflated larvæ, 1 pupa, 1 pupa shell.
Ampelophaga choerilus, 4 moths, 2 inflated larvæ, 2 pupæ, 1 pupa shell.
Ampelophaga myron, 4 moths, 1 inflated, 1 alc. larva in vial, 1 pupa,
 1 pupa shell.
Amphion nessus, 5 moths, 1 inflated larva, 2 pupæ.
 All told, 23 moths. 11 larvæ. 13 pupæ.

17. MOTHS AND THEIR CATERpillars FEEDING ON FOREST AND SHADE TREES.

Hyperchiria io, 4 males, 2 females, moths; 3 blown larvæ, 3 larvæ in
 2 alcohol vials; 1 pupa, 1 crippled moth emerging, 1 cocoon.
Anisota senatoria, 2 males, 2 females, moths; 3 blown larvæ, many
 larvæ in large vial; 2 pupæ, 1 pupa shell; vial with parasitized
 larvæ dry.
Dryocampa rubicunda, 2 males, 4 females, moths; 2 blown larvæ, 6
 larvæ in 1 alc. vial, 1 pupa, 1 pupa shell.
Anisota stigma, 2 males, 2 females, moths; 3 blown larvæ, 1 pupa, 1
 pupa shell.
Anisota virginensis, 5 males, 2 females, moths; 1 blown larva, 1 pupa,
 1 pupa shell.
 Altogether 27 moths. 11 inflated larvæ, 12 pupæ or shells. 5 vials
 alcohol larvæ.

18. SOME HAWK-MOTHS OF NEW JERSEY, TOGETHER WITH THEIR LARVÆ AND PUPÆ.

Sphinx drupifera, 1 male, 1 female, moth; 1 inflated larva, 1 pupa.
Sphinx cremitus, 1 male, 1 female, moth; 2 inflated larvæ, 1 pupa, 1
 pupa shell.
Ceratonia eatalpa, 1 male, 1 female, moth; 2 inflated larvæ, 1 pupa,
 1 pupa shell.
Sphinx kalmia, 1 male, 1 female, moth; 1 inflated larva, 1 pupa.
Sphinx luscitiosa, 1 male, 1 female, moth; 1 blown larva, 1 pupa, 1
 pupa shell.
Sphinx plebeius, Fabr., 1 male, 1 female, moth; 3 blown larvæ, 1 pupa,
 1 pupa shell.
Dolba hylæus, 1 male, 1 female, moth; 2 blown larvæ, 1 pupa.
Smerinthus geminatus, 1 male, 1 female, moth; 3 blown larvæ, 2
 pupæ, 1 pupa shell.
Triptogon modesta, 1 male, 1 female, moth; 1 blown larva, 1 pupa.
Paonias creææatus, 1 male, 1 female, moth; 3 blown larvæ, 1 pupa, 1
 pupa shell.
 Altogether 20 moths, 19 blown larvæ, 17 pupæ or shells.

19. SOME OAK GALLS FOUND IN NEW JERSEY MADE BY GALL WASPS OF THE FAMILY Cynipidæ.

Potato Gall by *Cynips quereus-batatus* on white oak. 1 card.
 Galls of *Cynips frondosa* on *Q. obtusiloba*. 1 card.
 Galls on tips of white oak twigs by *Cynips quereus-tuber*. 1 card.
 Galls made by a species of *Dryophanta*. 1 card.
 Galls on black oak by *Andricus punctatus*. 1 card.
 Spiny Gall on twigs of swamp oak by *Callirhytus cornigera*. 1 card.
 Galls of *Amphibolips sponifica* on red oak. 1 card.
 Galls of *Holcaspis q. globulus* on white oak twigs. 1 card.
 Galls made on white oak by *Cynips quereus-ficus*. 1 card.

Case of Insects in Museum, showing how they are displayed.

20. SOME NOCTUIDAE OR OWLET MOTHS FOUND IN NEW JERSEY.

- Acronycta clarescens*. Larval and pupal chambers in rotten wood. 1 card; 3 specimens.
Acronycta occidentalis. 1 vial containing larva; 9 specimens.
Heliothis armiger. Work in ear of sweet corn. 1 card; 2 vials showing work, 1 vial containing larva; 6 specimens.
Arzama obliquata. Work in cat-tail. 1 card; 3 specimens.
Lencaenia unipuncta. 1 vial containing larva; 12 specimens.

21. SOME INJURIOUS SESIIDAE INJURING CULTIVATED PLANTS IN NEW JERSEY.

- Sesia pictipes*. 1 card showing work, 1 specimen of work, 1 larva, 1 pupa, 1 cocoon; 5 specimens.
Sanninoides critiosa. 2 specimens of work, 1 larva, 1 pupa, 7 cocoons, 1 vial containing larvæ; 11 specimens.
Sesia accrui. 1 card showing work in maple; 12 specimens.
Melittia ceto. 1 vial containing eggs and larva, 1 card showing work, 1 pupa skin, 9 cocoons; 13 specimens.
Podosesia syringæ. 8 specimens.

22. SOME BOMBYCINE MOTHS FOUND IN NEW JERSEY.

- Symmerista albifrons*. 1 vial containing larva, 1 larva, 4 pupæ; 4 specimens.
Cerura borealis. 1 larva, 1 pupa, 1 cocoon, 1 vial containing larva; 5 specimens.
Cerura multiscripta. 1 larva, 1 pupa, 1 cocoon, 1 vial containing larvæ; 6 specimens.
Notolophus leucostigma. 2 cocoons with egg-masses, 5 larvæ, 1 pupa, 2 pupa skins, 1 moth emerging, 3 vials containing larvæ, 2 females, 8 males.
Cerura cinerea. 1 larva, 1 pupa, 1 cocoon; 4 specimens.
Schizura concinna. 2 larvæ, 1 pupa, 1 vial containing larvæ and work; 3 specimens.
Heterocampa manteo. 1 larva, 1 pupa, 1 vial containing larva, 3 males, 2 females.

23. INSECTS INJURIOUS TO HICKORY. BORERS AND BARK BEETLES.

- Oncideres cingulata*. 1 card showing girdling, 1 card showing work; 12 specimens.
Chramesus icoria. 1 card showing work; 11 specimens.
Cyllene pictus. 1 card showing larval galleries in wood, 1 card showing work in bark; 24 specimens.
Scolytus muticus. 3 cards showing work in wood and bark.

24. *Scolytus 4-spinosus* AND *Dicerca lurida*.

- 1 card showing work of *D. lurida* in wood.
 4 specimens of *D. lurida*.
 1 card showing work of *D. lurida* and *S. 4-spinosus* in bark and wood.
S. 4-spinosus. 40 specimens.
 1 card showing work in wood by adult, 1 card showing work in wood, 1 card showing work in bark.

25. SOME COMMON BUTTERFLIES FOUND IN NEW JERSEY.

- Papilio troilus*, 2 larvæ, 3 chrysalids, 1 chrysalis shell, 1 butterfly emerging; 1 male, 1 female.
Apastura clyton, 1 larva, 1 chrysalis; 1 male, 1 female.
Pieris rapæ, 2 larvæ, 2 chrysalids, 1 vial containing larvæ; 1 male, 1 female.
Papilio ajar, 2 larvæ, 1 chrysalis, 1 chrysalis shell; 1 male, 1 female.
Anax audria, 1 larva, 2 chrysalids, 2 chrysalid shells, 1 larva in case; 1 male, 1 female.
Endamus tityrus, 2 larvæ, 1 pupa; 2 males, 2 females.
Papilio philenor, 2 larvæ, 1 chrysalis, 1 chrysalis shell, 1 vial of larvæ, 1 vial of pupæ; 1 male, 1 female.
Pyramcis atalanta, 1 chrysalis shell; 1 male, 1 female.
Junonia cænia, 2 larvæ, 1 chrysalis; 1 male, 1 female.

26. SOME COMMON BUTTERFLIES FOUND IN NEW JERSEY.

- Vanessa antiopa*, 1 egg mass on twig, 2 larvæ, 1 chrysalis, 3 chrysalid shells, 1 vial containing larvæ; 1 male, 1 female.
Pyramcis cardui, 2 larvæ, 1 chrysalis; 1 male, 1 female.
Pyramcis huntera, 1 larva, 1 chrysalis; 1 male, 1 female.
Danaus plexippus, 2 larvæ, 1 chrysalis, 1 chrysalis shell; 1 male, 1 female.
Limenitis archippus, 2 larvæ, 1 larva case, 1 chrysalis, 1 chrysalis shell, 1 vial containing larva; 1 male, 1 female.
Limenitis ursula, 1 larva, 1 chrysalis, 1 chrysalis shell, 1 larva case; 1 male, 1 female.
Grapta interrogationis, 2 larvæ, 1 chrysalis, 1 vial containing chrysalis; 2 males, 2 females.
Grapta comma, 3 larvæ, 3 chrysalids, 1 parasite on chrysalis; 1 male, 1 female.
Euptoietia claudia, 2 larvæ, 1 chrysalis; 1 male, 1 female.

27. SOME BOMBYCINE MOTHS FOUND IN NEW JERSEY.

- Estigmene aceræa*, 2 larvæ, 1 pupa; 2 males, 2 females.
Pyrharcetia isabella, 2 larvæ, 1 cocoon with pupa, 1 vial containing larvæ; 2 males, 2 females.
Hyphautria cunea, 2 larvæ, 1 pupa, 1 vial containing larva; 3 males, 3 females.
Actias luna, 1 larvæ, 4 cocoons, 1 pupa, 2 vials containing larvæ; 3 males, 1 female.
Spilosoma virginica, 4 larvæ, 1 pupa, 1 cocoon, 1 pupa shell, 1 vial with larvæ; 2 males, 2 females.
Utetheisa bella, 2 larvæ, 2 pupæ, 1 vial of larvæ; 7 specimens.
Cycnia Egle, 2 larvæ, 2 pupæ, 1 cocoon, 1 vial containing larvæ; 2 males, 2 females.

28. SOME SPECIES OF NOTODONTID MOTHS FOUND IN NEW JERSEY.

- Datana ministra*, 2 larvæ, 2 pupæ, 1 vial of larvæ; 2 males, 2 females.
Mcclalopha inclusa, 2 larvæ, 1 pupa, 1 cocoon, 1 cocoon with parasites, 1 vial of larvæ, 1 vial of cocoons; 4 males, 4 females.
Nudata gibbosa, 2 larvæ, 1 pupa, 1 vial containing larvæ; 2 males, 2 females.

Insects Injurious to Forest. Received a Gold Medal at the South Carolina Inter-State and West India Exposition.

Datana Major, 4 larvæ, 1 pupa, 1 pupa shell, 2 vials of larvæ; 2 males, 2 females.

Datana perspicua, 3 larvæ, 1 pupa, 1 pupa shell, 1 vial of larvæ; 2 males, 2 females.

Datana integerrima, 2 larvæ, 1 pupa, 1 pupa shell, 1 vial of larvæ; 2 males, 2 females.

Datana angusii, 2 larvæ, 1 pupa, 1 pupa shell; 1 male, 1 female.

29. THE SEVENTEEN-YEAR LOCUST, *Cicada septendecim*, showing females and empty pupal shells resting on twigs. Also, 8 cards of twigs—birch, pear, sassafras, oak, cherry, apple, peach and seedling pear—in which eggs have been oviposited.

30. THE SEVENTEEN-YEAR LOCUST, *C. septendecim*, showing exit holes in earth, some twigs in which eggs have been oviposited and 21 specimens, 5 of which are spread.

31. THE SEVENTEEN-YEAR LOCUST, *C. septendecim*, containing 16 cones or towers and 47 specimens representing the development of the insect.

32. THE ROSE SCALE, *Diaspis rosa*, Bouche: 6 vials containing infested twigs: 4 infested twigs, pinned; 4 cards illustrating the insects and 1 card describing the injury.

33. SOME INSECTS INJURIOUS TO ELM TREES.—A number of specimens of *G. luteola*; 1 card showing injury to leaves, 1 card showing egg masses, 1 vial containing larvæ, 1 vial containing pupæ. A number of specimens of *Anthraxia viridifrons* and 1 card showing injury of larvæ to elm branches. Eight males and 1 female of *Zeuzera pyrina*, and 1 card showing elm branch completely girdled by larva, 1 vial containing 1 larva and 1 vial containing 1 pupa.

34. SOME PAPER WASPS: 1 card showing comb of *Vespa maculata*, 1 card showing outer covering, a small nest and 25 specimens; 1 card showing combs of worker and female cells of *Vespa germanica* and 16 workers, 6 males and 3 females; 1 card showing unprotected paper combs of *Vespa* Sp. and 11 specimens.

35. THE LARGE CARPENTER BEE, *Xylocopa virginica*; 2 large and 2 smaller pieces of wood showing borings, 2 pieces showing cell divisions, 1 piece of wood showing cells or cases of leaf fragments and 15 specimens.

36. MUD WASPS AND THEIR NESTS: 2 cards showing mud cells of *Pelopæus cementarius*, 1 card showing nest of *Pelopæus cementarius* on clothes hook, 1 card showing cells of *Pelopæus* Sp., 1 card bearing nests of *Chalybion corulcum*, 2 cards showing nests of *Eumenes fraterna* on twigs, 2 tubes containing nests of *Eumenes fraterna*, piece of shingle bearing cells of *Chalybion corulcum*: 14 specimens of *P. cementarius*, 16 specimens of *C. corulcum*.

MORE INFORMATION.

To those wishing more information about the insects of New Jersey, how to distinguish them, how to destroy them, or how to study them, we would refer them to what we consider one of the best books ever issued on the subject. We refer to the Report of the New Jersey State Board of Agriculture, entitled "Insects of New Jersey," by John B. Smith, Sc.D., State Entomologist, of the Agricultural College Experiment Station, at New Brunswick, N. J. It is a supplement to the Twenty-seventh Annual Report of the State Board of Agriculture.

Every farmer and horticulturist in the State should have a copy of it, if it can be procured. Professor Smith, the author of it, has charge of the insect or entomologist department of the State Museum. He has prepared the thirty-one cases now exhibited in the Museum. He is still preparing others which will from time to time be added to the present exhibit.

WOODS OF SOUTHERN NEW JERSEY.

In the Forestry Department of the State Museum there is what is known as "the Benjamin Heritage Collection." It was collected by Mr. Benjamin Heritage, of Mickleton, Gloucester county, N. J., assisted by his friends and neighbors, and through Commissioner John C. Smock, then State Geologist, presented to the New Jersey State Museum.

At a meeting of the Museum Commission a unanimous vote of thanks was tendered to Mr. Heritage and those who assisted him in making the collection.

These specimens are about three and one-half feet long, and nearly all were found in or near Gloucester county. A few came from Camden and Salem counties. They were sent to Trenton three years ago, but for want of room were, through the kindness of Quartermaster General Richard A. Donnelly, stored in the State Arsenal.

When Governor Foster M. Voorhees and the State Commissions for the Pan-American Exposition asked the Museum Com-

Forestry Exhibit of the New Jersey State Museum at the Pan-American Exposition, 1901, where it Received Gold, Silver and Bronze Medals and Honorable Mention; and at the South Carolina Inter-State and West India Exposition, where it Received a Gold and Bronze Medal and Honorable Mention.

Plate VIII.—Second-growth Pitch Pine, Ocean County.
Loaned by the N. J. Geological Survey.

REPORT OF NEW JERSEY STATE MUSEUM. 43

mission to make a forestry exhibit in Buffalo in 1901, these specimens were prepared for the exhibit at the New Jersey School and Church Furniture Company's factory, at Trenton, N. J. They were so finished as to show the transverse, radial and tangential sections—one-half of the exposed surface being polished, the other remaining in its natural state.

Two large plate-glass cabinets were procured to protect and better exhibit the specimens. The cabinets are now with the specimens in the Museum at Trenton. The success of the Forestry Exhibit at Buffalo and Charleston will be given in another part of this report.

The following is a list of the specimens, with the names of the donor of each:

<i>Scientific Name.</i>	<i>Common Name.</i>	<i>Contributed by</i>
1. <i>Magnolia glauca</i> (L.)	Magnolia	Wm. H. Borden.
2. <i>Liriodendron tulipifera</i> (L.)	Tulip tree	Wm. H. Borden.
3. <i>Ailanthus glandulosa</i> (Delf.)	Tallow tree, &c.	Joseph Stratton.
4. <i>Ilex opaca</i> (Art.)	Holly	Joseph Stratton.
5. <i>Acer rubrum</i> (L.)	Red Maple	Wm. H. Borden.
6. <i>Robinia pseud-acacia</i> (L.)	Common Locust	Hope L. Moore.
7. <i>Gleditschia triacanthos</i> (L.)	Honey Locust	John Heritage.
8. <i>Prunus americana</i> (L.)	Wild Plum	Hope L. Moore.
9. <i>Prunus scrotina</i> (Ehrh.)	Wild Cherry (Black)	Chas. Heritage.
10. <i>Prunus cerasus</i> (L.)	Common Black Cherry (in woods)	John Heritage.
11. <i>Crataegus coccinea</i> (L.)	Scarlet-fruited Thorn	Joseph Stratton.
12. <i>Amelanchier botryapium</i> (L.)	Shad Bush — May Cherry	Joseph Stratton.
15. <i>Cornus florida</i> (L.)	Witch Hazel	John P. Reese.
14. <i>Liquidambar styraciflua</i> (L.)	Sweet Gum	Joseph Lodge.
15. <i>Cornus Florida</i> (L.)	Dogwood	Samuel Borton.
16. <i>Nyssa sylvatica</i> (Marsh.)	Sour Gum	Chas. Heritage.
17. <i>Diospyros virginiana</i> (L.)	Persimmon	Friends' School.
18. <i>Fraxinus americana</i> (L.)	White Ash	David S. Adams.
19. <i>Sassafras sassafras</i> (L.), (Kant.)	Sassafras	Chas. Heritage.
20. <i>Ulmus americana</i> (L.)	Common Elm	Job S. Haines.
21. <i>Morus rubra</i> (L.)	Red Mulberry	Geo. Magin.
22. <i>Platanus occidentalis</i> (L.)	Buttonwood	Burkett Warrington.
23. <i>Hicoria alba</i> (L.), (Britt.)	Mocker Nut	Geo. Magin.
24. <i>Hicoria glabra</i> (Mill.), (Britt.)	Pig-nut Hickory	Chas. Heritage.
25. <i>Juglans nigra</i> (L.)	Black Walnut	John Heritage.
26. <i>Betula lenta</i> (L.)	Sweet Birch, Cherry Birch	
27. <i>Carpinus caroliniana</i> (Walt.)	American Horbeam	David S. Adams.
28. <i>Quercus alba</i> (L.)	White Oak	Chas. Heritage.

44 REPORT OF NEW JERSEY STATE MUSEUM.

Scientific Name.	Common Name.	Contributed by
29. <i>Quercus minor</i> (Marsh.), (Sarg.)	Post Oak, Iron Oak.	Friends' School.
30. <i>Quercus prinus</i> (L.)	Rock Chestnut Oak.	Jos. T. Carter.
31. <i>Quercus prinoides</i>	Scrub Chestnut Oak.	David S. Adams.
32. <i>Quercus phellos</i> (L.)	Willow Oak	Chas. Heritage.
33. <i>Quercus marylandica</i> (Muenchf.)	Barreu Oak	Wm. M. Ogden.
34. <i>Quercus heterophylla</i> (Michx.)	Bartram's Oak	Joseph Stratton.
35. <i>Quercus digitata</i> (Marsh.), (Sudw.)	Spanish Oak	Wm. H. Hoffman.
36. <i>Quercus coccinea</i> (Wang.)	Scarlet Oak	Chas. Heritage.
37. <i>Quercus velutina</i> (Lam.)	Black Oak	Chas. Heritage.
38. <i>Quercus rubra</i> (L.)	Red Oak	Elmer Bradshaw.
39. <i>Quercus palustris</i> (Du Roi)	Swamp Oak, Pin Oak.	Chas. Heritage.
40. <i>Castanea dentata</i> (Marsh.), (Berk.)	American Chestnut	Chas. Heritage.
41. <i>Fagus americana</i> (Sweet)	American Beech	Samuel Borton.
42. <i>Salix alba</i> (L.)	White Willow	Elmer Bradshaw.
43. <i>Salix nigra</i> (Marsh.)	Black Willow	Wm. H. Hoffman.
44. <i>Populus tremuloides</i> (Michx.)	American Aspen	John P. Reese.
45. <i>Chamaeyparis thyoides</i> (L.), (B'tp.)	Southern White Cedar,	James Holms.
46. <i>Juniperus virginiana</i> (L.)	Red Cedar	J. C. Heritage.
47. <i>Pinus rigida</i> (Mill.)	Pitch Pine, Torch Pine, Ed. Clark. Jersey Pine, Scrub	
48. <i>Pinus virginiana</i> (Mill.)	Pine	Jos. S. Carter.
49. <i>Benzoin benzoin</i> (L.), (Coul- ter)	Spice Bush	Job S. Haines.
50. <i>Rhus toxicodendron</i> (L.)	Poison Ivy P. Vine.	Job S. Haines.
51. <i>Castanea pumila</i> (Mill.)	Chinquapiu	Wm. H. Hoffman.
52. <i>Amelanchier canadensis</i> (Medic.)	May Cherry	Chas. Heritage.
53. <i>Chionanthus virginica</i> (L.)	Fringe Tree	Joseph Jenuings.
54. <i>Acer negundo</i> (L.)	Negundo	James Jessup.
55. <i>Tilia americana</i> (L.)	Basswood	John S. Jessup.
56. <i>Tsuga canadensis</i> (L.)	Hemlock	Truit Mannington.
57. <i>Betula lenta</i> (L.)	Black Birch	John P. Reese.
58. <i>Hicoria minima</i> (Britt.)	Bitternut Hickory	Walter S. Bassett.
59. <i>Hicoria macrocarpa</i> (Mur.), (Britt.)	Hickory	Walter S. Bassett.
60. <i>Quercus platanioides</i> (bicolor, wild)	Swamp White Oak.	Wesley B. Gill.
61. <i>Ulmus americana</i> (L.)	Elm	Wesley B. Gill.
62. <i>Frazinus nigra</i> — <i>Sambricifolia</i> (Lam.)	Black Ash	Alfred H. Bradshaw.
63. <i>Morus alba</i> (L.)	White Mulberry.	Mrs. James Howey.
64. <i>Quercus lyrata</i>	Oak	Mr. Bilderhack.
65. <i>Alnus scroloate</i> (Du Rio), (Koch.)	Smooth Alder	Job S. Haines.

Plate XXII.—White Cedar Swamp, Ocean County, N. J., Before the Fire.
Plate loaned by N. J. Geological Survey.

Plate IV.—White Cedar Swamp, Burlington County, N. J., Killed by Fire.
Plate loaned by N. J. Geological Survey.

Plate VII.—Original Pine Forest in South New Jersey.
Plate loaned by N. J. Geological Survey.

THIN SECTIONS OF WOOD.

In order that the wood specimens may better be studied, we have one of the best collections of thin sections of wood that could be procured. They were prepared by Romeyn B. Hugh, B.A., of New York. This collection comprises over two hundred different species of wood with three specimens of each, showing the "transverse," "radial" and tangential surfaces, cut thin enough to allow the transmission of light, and securely mounted in well-made frames. These are placed in swing cabinets between glass so they can be easily examined and be protected from injury.

In this way the specimens can be studied by anyone. They show the sap-cells, growth and grain of the wood. This collection, in connection with the large wood specimens and the photographs of the growing trees, make a most valuable and instructive exhibit.

We are soon to add to the Forestry Department the natural leaves, flowers and fruit of the several specimens, as well as photo-engravings of the tree-trunks, showing the bark and leaves. When this is accomplished the Museum will have one of the best exhibits of our New Jersey forest woods.

OTHER SPECIMENS OF WOOD.

In addition to the Heritage collection there are over one hundred (100) specimens from other parts of the State. These are a portion of the wood exhibit which the State Geological Department made at the Centennial Exposition, in Philadelphia, in 1876. Several specimens of the original collection have been lost. Among the specimens in this collection are two sections of large white cedar logs from the swamps near Dennisville, Capo May county. They were found about twelve feet under ground and presented to the Geological Survey of New Jersey by Dr. Maurice Beesley. These logs were dug out and manufactured into shingles and other forms of lumber, and for a time furnished a profitable business industry.

Ex-State Geologist John C. Smock will take charge of all further additions to the wood collections. Because of his interest in the Museum, his success in the geological department of the State, and his well-known ability, we anticipate many valuable additions to the Forestry Department.

THE FURNITURE IN THE MUSEUM.

With the exception of the old exhibit cases used at the Centennial Exposition, in Philadelphia, in 1876, all the other furniture except a few small table-cases paid for by the Geological Survey, the furniture in the Museum was procured by the several departments when making exhibits at the Chicago World's Fair and the Buffalo Pan-American Exposition. It includes that from the Educational, Geological, Forestry, Agricultural, Women's and Transportation exhibits.

The furniture from the Chicago Educational Exhibit consists of six large exhibit tables, sixty-five New Jersey wing cabinets, sixteen large show-cases and tables combined, two hundred different frames for exhibit work, together with other furniture used in exhibits, and costing in the aggregate over \$3,000.

From the Pan-American Exposition, ten wing cabinets, four show-cases, a number of picture and other frames, shelving, drawers, portfolios, &c.

From the Transportation or New Jersey Coast Exhibit at Chicago, one hundred large photographs framed and covered with glass 4 feet 9 inches by 2 feet 9 inches, and fifty smaller framed photographs, the whole costing the State over \$10,000.

The furniture of the Geological and Forestry Exhibits comprises four large plate-glass show cabinets for wood and other specimens (costing about \$1,000), one nest of drawers, thirty small show-cases for insects and four tables for holding them, table for large relief map of the State of New Jersey, several large frames, frames for transparencies, two bookcases, swing frames for maps and spring rollers for maps.

From the Agricultural Exhibit, one large upright stereopticon with views of New Jersey farm scenes, three hundred glass jars for exhibit purposes and a set of swing frames for maps.

Women's Chicago Exhibit, a cluster of twelve double glass frames hung on a central standard, for statistical exhibits.

Had it not been for the State Museum this furniture and the many valuable exhibits from the several expositions would not have been saved to the State. Now they are cared for and ready for use if wanted for future expositions.

Plate VI.—Pitch Pine Three Years After a Fire.
Loaned by the N. J. Geological Survey.

OTHER EXHIBITS.

MAMMALS.

The Commission intends to include this branch of natural history. Though the present collection is small, it contains some very fine specimens. A list of them will be given in next year's report.

FISH.

A collection of the different kinds of New Jersey fish has been commenced. We take an especial interest in this form of animal life and shall procure specimens that will be a credit to the Museum.

MOLLUSCS.

The collection of both salt water and fresh water shells is not complete, yet the exhibit of salt water shells comprises nearly all of those found along the New Jersey coast, and includes some deep-water shells. Though far from complete, the fresh water collection contains a large number of specimens, and frequent additions are being made.

INDIAN RELICS.

Several new specimens have been added to our collection of New Jersey Indian relics by Mr. Long, of Trenton, N. J. Mr. Long has consented to take charge of this exhibit.

New Jersey is rich in its Indian relics and many others should be added to those now in the Museum. Now that a place is provided for them, none of these relics should be taken out of the State. The Commission will gratefully accept such additional specimens as may be sent to the Curator of the Museum.

MANUFACTURERS' EXHIBITS.

We hope soon to include exhibits that will promptly illustrate our varied and valuable manufacturing interests. This matter has been delayed simply because of a lack of room. There are several firms ready to make exhibits of their goods when we can properly display them. We hope to be able to do this in the near future.

CONCLUSION.

The Museum Commission and the Curator are duly grateful to the State House Commission, to the Custodian of the State House and those under his direction for their uniform courtesy. The Curator feels he cannot speak in too high terms of the other members of the Museum Commission. Without their kind words and assistance he could not have made the Museum what it is.

FINANCIAL STATEMENT.

We give below the financial statement of the amount expended for furniture, specimens, glass globes, mounting and grouping the birds, nests, &c., under globes and other expenses, from the establishing of the Museum.

This does not include the furniture which constitutes the part of it that came from the Chicago and Buffalo Expositions, which is given in another part of the report.

FINANCIAL REPORT FROM 1898 TO 1902, INCLUSIVE.

Naar, Day & Naar, printing and stationery.....	\$33 55
J. L. Murphy Publishing Co., printing circulars.....	40 00
Total	<hr/> \$73 55

Silver Gray Fox in Cabinet No. 5.

REPORT OF NEW JERSEY STATE MUSEUM. 49

1899.

Adams Express Co., expressage, \$4.85 and \$2.45.....	\$7 30
MacCrellish & Quigley, printing and stationery.....	11 00
Twenty Insect Cabinets.....	25 00
Dallas R. Smith, specimens, birds.....	43 75
W. H. Werner, birds, nests and mounting of birds.....	192 25
Total.....	\$279 30

1900.

Romeyn B. Hough, American woods, 168.....	\$60 00
Romeyn B. Hough, sixty photographs of trees.....	18 00
Adams Express Co., express.....	6 30
Freight and carting wood specimens.....	14 20
Blanch Howell, carved wood (list).....	8 00
W. H. Weruer, specimens of birds, animals, &c.....	158 75
Dallas R. Smith, birds and animals.....	51 65
N. J. School and Church Furniture Co., two leaf cabinets.....	45 00
Prof. J. B. Smith, papering and fixing cases.....	28 80
S. L. Crosby Co., bird specimens.....	19 00
John H. Studer, copy of birds of North America.....	12 50
Total.....	\$422 20

1901.

Adams Express Co., express.....	\$6 11
Frazar & Cutchley, mounting birds.....	4 00
MacCrellish & Quigley, stationery.....	9 25
Dallas R. Smith, glass shades (40).....	64 00
S. L. Crosby Co., mounting birds and fish.....	35 00
W. A. Werner, birds, animals, uests, eggs and groupiug.....	259 00
Dallas R. Smith, glass shades.....	53 00
N. J. School and Church Furniture Co., three oak tables.....	69 00
Total.....	\$499 36

1902.

Jacob C. Cassel, glass shades.....	\$66 85
Basatic Schosmacher, 700 plant specimens.....	30 00
S. L. Crosby Co., mounted specimens.....	57 00
Dallas R. Smith, bird and animal specimens.....	46 50
N. J. School and Church Furniture Co., two tables.....	46 00
J. C. Cassel, glass globes, &c.....	26 57
Hughes' Delivery, carting.....	2 50
W. H. Werner, specimens of birds, eggs, nests, animals, grouping, material, &c.	222 25
Total.....	\$497 67

THE ORIGIN OF THE NEW JERSEY STATE MUSEUM.

EXTRACT FROM GOVERNOR GEORGE T. WERTS' ANNUAL MESSAGE
OF 1895.

"The exhibits (at the World's Fair, Chicago, 1893) included the educational, agricultural, geological and seacoast exhibits. These exhibits were very fine and cost large sums of money. If preserved intact they are now worth more than their original cost, as it would be impossible to duplicate them. The furniture was quite costly. The exhibits and furniture are now stored in the Fidelity Storage Warehouse in the city of Trenton.

"In my opinion the exhibits should be preserved, and the State should provide some place or places where they may be placed as a museum or educational exhibit. They should not be sold as a whole, and to sell them piecemeal would produce but an insignificant sum, and destroy what can never be replaced."

LAW.

In accordance with this recommendation of the Governor, the Legislature passed the following law:

CHAPTER CLXXXIII.

An Act to establish and maintain a State Museum.

WHEREAS, The Governor of this State has recommended that the exhibits of the several departments of the state government at the Columbian exposition at Chicago be placed on permanent exhibition; and whereas, said exhibits would form a nucleus of an exhibit, which would be of great value in showing the educational, agricultural and industrial development of the state; therefore.

1. BE IT ENACTED by the Senate and General Assembly of the State of New Jersey, That the commission now having charge of the restoration of the state house shall have power, and it shall be its duty, to cause to be prepared, suitable rooms in said state house for a museum for the preservation and display of the exhibits of the several state departments at the Chicago exposition, and for such other exhibits as may from time to time be placed therein by the commission having control of said museum, as provided in the second section of this act, and the expenses incurred in the preparation of said rooms shall be paid on the

warrant of the comptroller out of any moneys in the state treasury not otherwise appropriated.

2. *And be it enacted*, That the state superintendent of public instruction, the state geologist, the president of the state board of agriculture, the president of the senate and the speaker of the house of assembly are hereby constituted a commission, which commission shall have control of said museum, and shall make all necessary rules and regulations for the proper care and maintenance thereof, and said commission may appoint a curator, who shall, under the direction of said commission, arrange and classify the several exhibits, and shall have charge of said museum and exhibits, and shall perform such other duties in connection therewith as shall be directed by said commission, and he shall be paid such a compensation as said commission shall determine, but not to exceed the sum of fifteen hundred dollars per annum, which compensation shall be paid by the state treasurer in equal monthly installments upon the warrant of the comptroller.

3. *And be it enacted*, That this act shall take effect immediately.

Approved March 20, 1895.

It will be seen that the act made it the duty of the Commission having charge of the restoration of the State House to have prepared suitable rooms for said Museum. Before any action was taken the Commission was abolished, and in 1896 the following amendment was enacted, making it the duty of the Museum Commission to prepare plans for such alterations as were necessary to provide suitable rooms for the Museum in the State House, provided that said plans should be approved by the State House Commission and the work done under its supervision:

AMENDMENT TO ACT OF 1895.

Chapter 195 of the Laws of 1896.

An Act to amend an act entitled "An act to establish and maintain a state museum," approved March twentieth, one thousand eight hundred and ninety-five.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*:

1. Section one of an act entitled "An act to establish and maintain a state museum," approved March twentieth, one thousand eight hundred and ninety-five, be and the same is hereby amended so as to read as follows:

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*:

1. The commission provided for in the second section of the act to which this is an amendment, shall have power and it shall be its duty to cause to be prepared plans to provide suitable rooms in the state house at Trenton for a museum for the preservation and display of the agricultural, geological and educational and other exhibits of the state departments at Chicago exposition, and for such other exhibits as may from time to time be placed therein by said

52 REPORT OF NEW JERSEY STATE MUSEUM.

commission, and the expenses incurred in the preparation of said rooms and for the care of said exhibits shall be paid by the state treasurer on the warrant of the comptroller; provided, that the plans for the alterations necessary to provide said rooms shall be approved by the governor, comptroller and treasurer, or a majority of them, and the work done under their direction, and no work shall be commenced or contract entered into until a specific appropriation is provided for the purposes set forth in the act to which this is a supplement.

2. This act shall take effect immediately.

Approved April 21, 1896.

CIRCULARS OF INFORMATION.

That the object of the New Jersey State Museum should be understood by the people of the State, the Commission requested the Curator to prepare circulars stating its objects, and to have them distributed throughout the State.

In compliance with this request the following circulars were prepared, printed and circulated, and are still being distributed.

That the object of the Museum may be understood, we insert in this report Circular No. 1:

STATE OF NEW JERSEY.

THE STATE MUSEUM.

CIRCULAR OF INFORMATION.

The State Museum was established by act of the Legislature, approved March 20th, 1895.

It had its origin in the collections made by the State for the World's Columbian Exposition in Chicago in 1893. Governor Werts, in his message to the Legislature in 1895, said: "The exhibits include the educational, agricultural, geological and seacoast exhibits. These exhibits were very fine and cost large sums of money. If preserved intact, they are now worth more than their original cost, as it would be impossible to duplicate them. In my opinion the exhibits should be preserved, and the State should provide some place or places where they may be shown as a museum or educational exhibit. They could not be sold as a whole, and to sell them piecemeal would produce but an insignificant sum and destroy what can never be replaced."

The Geological Survey, the Department of Public Instruction and the State Board of Agriculture were represented in the exhibits referred to in the Governor's message. In accordance with the above recommendation a Commission was created, consisting of the President of the Senate, the Speaker of the House of Assembly, the State Geologist, the Superintendent of Public Instruction and the President of the State Board of Agriculture. The object of this Commission is to establish a Museum for the proper exhibition of these collections of the State and to appoint a Curator to have general charge of such Museum. The

members of this Commission serve without compensation, and the Curator receives a regular salary, as stipulated in the act.

Supplementary legislation (Chapter 195, P. L. 1896) makes it the duty of the Museum Commission "to prepare plans for such alterations as are necessary to provide suitable rooms in the State House," provided said plans shall be approved by the State House Commission and the work be done under its supervision.

The act further provides that no work shall be done or contract entered into without a specific appropriation for that purpose. As no appropriation has been made, the Museum is limited to the corridors and two small attic rooms in the old central portion of the State House. The collections of the Geological Survey are on the third floor of the rear building or extension, in a room assigned to the Survey by the State House Commission in 1892. The space allotted to the Museum is insufficient and unsuitable for the exhibition of the several collections. Although the Geological Survey room and the rooms assigned to the Educational and Agricultural exhibits are now full, many boxes of minerals, fossils and educational and agricultural exhibits are stored in the basement of the State House.

The Museum Commission has appointed S. R. Morse, of Atlantic City, Curator of the Museum.

OBJECTS OF THE MUSEUM.

State Museums have been established and maintained with successful results, and proved of value in all other leading States of our country. They supplement and illustrate the Geological and Natural History Surveys and the reports of their Boards of Agriculture and Departments of Education. They are neither simply collections of curiosities nor repositories of materials found in the State, but are designed to be in touch with its life, to illustrate its natural resources and capabilities, and to constitute an important part of its educational auxiliaries.

In New Jersey the Geological Survey is thus illustrated by collections of minerals, ores, rocks and other natural products of economic importance, and by models, maps and publications descriptive of the occurrence of these materials. It is desirable that these collections be so enlarged as to be truly representative of the physical geography and the geology of our State, and to show what has been done in the development of its natural resources. They would be most helpful to every student seeking information in regard to the geological structure, the geographical extent and location of the various rocks, the paleontological contents of these formations and their life history.

The State Museum should include collections which would show the staple products of the soil, of the fruit orchards, of the farm, of the dairy, and other branches of agricultural industry. The implements of husbandry should make one section of the Agricultural Department of a Museum, would show the improvement in mechanical help to the farmer and be suggestive of still further improvements. Specimens of the wood and of the timber trees growing naturally in the State, together with leaves and fruit to show their botanical relations, should be a part of such a collection, and would be interesting alike to the lumberman and the botanist.

Mounted specimens of the common and more valuable kinds of domestic animals, and of the choicest breeds of fowls, would add to the agricultural part of the Museum and make a most attractive feature. A collection of the insects that prey upon our shrubbery, fruit trees and agricultural products, together with reliable directions as to the most effective means of protection against them, or

for their possible extermination, would furnish most valuable information to every owner, either of a lawn or a farm.

The mechanic arts should be represented by work from the factories, which would show the progressive stages of manufacture. The iron furnaces, steel works, potteries, brick yards, mills making textile fabrics, metallurgical works, and all other industrial establishments of the State ought to be represented, and the Museum would show these products of labor in foundry, factory, shop and mill, as well as the ores of the mines and crops of the fields and the products of the forest, presenting, as it were, a picture of the State with its natural resources, their several forms under the hand of the worker, and when transformed into articles adapted to the use of man.

The Museum should be educational in the highest sense, and not a mere collection of specimens without suggestion or educational value. It should, therefore, include within its scope the work of the district schools, of the high schools and academies, of the colleges and of the manual training schools, so as to illustrate methods of teaching and the results of school-work, and to show what our educational system is doing to enable our youth intelligently to study the natural occurrences of minerals, rocks and ores, the phases of geological formations and the agricultural and industrial products, and to help them to use these resources to the best advantage. The highest development of natural wealth depends upon broad training in our schools, and every worker should have the advantages afforded by the best instruction. The establishment of such a Museum is essential to our proper representation at all State, provincial and world expositions. It provides at once the nucleus of a State exhibit, saves the large cost of making it anew, and by its constant gathering of valuable minerals affords a much broader range for selection. Small collections of duplicates of the exhibits of the several departments of the Museum could be made and loaned for a limited time to the schools and other institutions in the State.

A part of the Chicago exhibit has been placed in cases in the attic rooms and corridor of the third story of the State House central building, but gives a very imperfect impression of what could be done with adequate room.

Issued by order of the Commissioners.

CHAR. J. BAXTER, *President*.

JOHN C. SMOCK, *Secretary*.

S. R. MORSE, *Curator*.

MORE CABINETS NEEDED.

The need of additional cases for the Museum is urgent. All the available cases are filled, and large collections of minerals and fossils which ought to be on exhibition are stored away in the basement of the State House for lack of space in which to display them. The cases now in use for the display of the geological specimens are old and ill-fitted for their purpose. They are wasteful of room, for purposes of display, and they afford no space for proper storage of duplicates. If these cases were replaced by new ones of a different type, two or three times as much material could be displayed in the same space. Not

only would there be a gain in space, but there would be an important increase in the attractiveness of the whole Museum. So long as the present cases are retained, there is but little chance of improving the mineralogical and geological exhibits.

If, however, it is necessary to retain the old cases for a time, a few new ones should at once be provided to fill the remaining floor space and afford a means to display some of the extra material on hand.

S. R. MORSE,
Curator.