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FIFTY YEARS OF MUSEUM WORK

Autobiography, Unpublished Papers,
and Bibliography

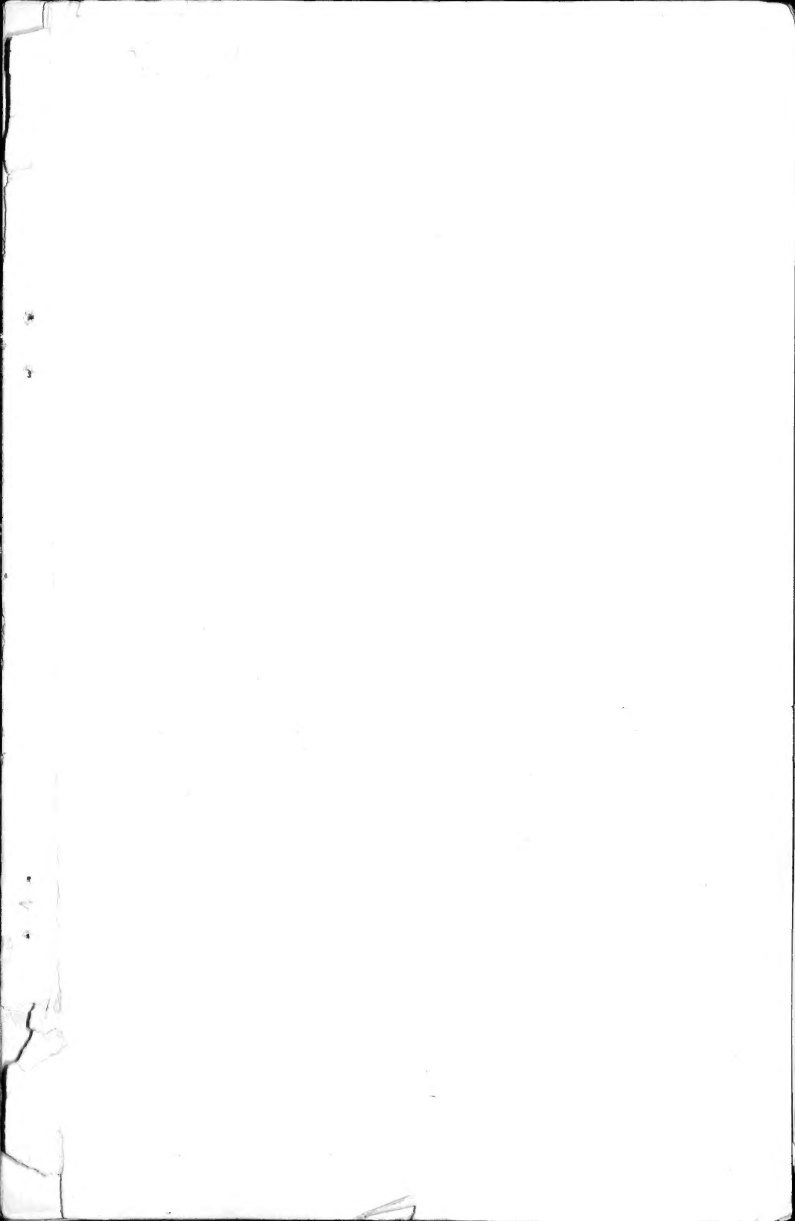
of

FREDERIC A. LUCAS, Sc.D.



PUBLISHED BY THE MUSEUM
NEW YORK
1933







Champlin Studios, New York

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FREDERIC AUGUSTUS LUCAS, 1923

F. A. Lucas

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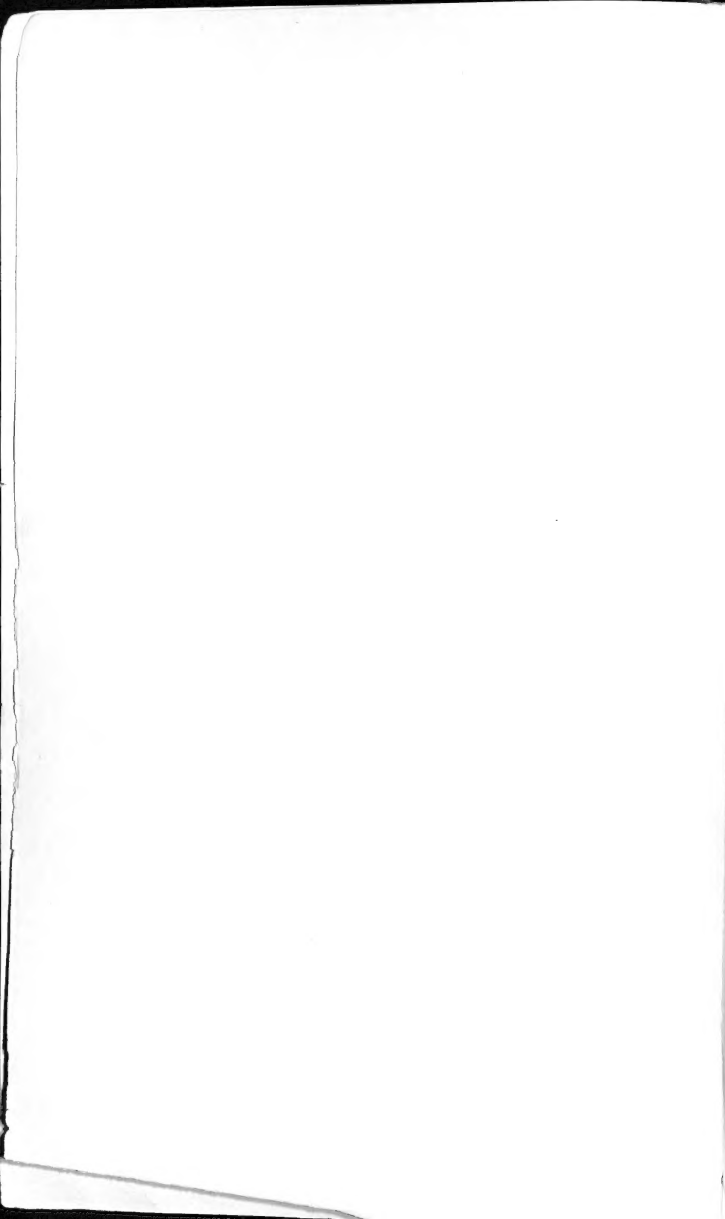
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FOREWORD

To few men are granted fifty years of service to any great cause. In his fifty years of original and inspiring service to three leading American institutions, the National, the Brooklyn, and the American Museums, Frederic A. Lucas holds an absolutely unique record. Other men have served one institution throughout similar periods of life, but to render brilliant and enduring service in three institutions is without a parallel. We do not need to look far for an explanation; he was eminently museum-minded, as evidenced in his rare powers of museum expression both in the artistic and natural arrangement of exhibits and the preparation of descriptive labels. Gifted to an unusual degree with the all-too-rare talent of what may be called museum-expression, such gifts would have been valueless and even dangerous if not superposed on a thorough and splendid training as a naturalist.

Dr. Lucas's lifelong researches in many branches of natural history, beginning in the year 1880 and ending in 1929, include no less than 365 titles which range in the old-fashioned way from insects to dinosaurs through the whole gamut of fishes, amphibians, reptiles, birds and mammals. With equal penetration and judgment resulting from his own observations, Dr. Lucas treated this diversity of subjects from the varied standpoints of comparative anatomy and osteology, of zoogeography, of habit and special function, all of which conspired to furnish his museum mind with encyclopædic knowledge. He did not have to read books to write labels; he turned to his own resourceful observations of a lifetime.

Nor should we forget his travels, and many equally original contributions to the cause of conservation of animal life as an important part of his equipment for the Directorship of great museums like the Brooklyn or the American. It was his own original work, too, which fortified his contributions to the *New International Encyclopædia* and to *Champlin's Young Folks' Cyclopædia of Natural History*. Altogether he was in great demand as a writer for encyclopædias. The greatest possible monument and demonstration of his rare abilities is his vitalizing work in the Department of Natural History in the Brooklyn Museum.

The call to the Directorship of the American Museum of Natural History in the year 1911 put his powers to the highest test. Fortunately he was in fine health and accepted this great task with rare energy and determination. His altogether unique museum training, beginning in Ward's Natural Science Establishment, that fertile mother of great

Museum leaders, soon manifested itself on every side. With the unexpressed Latin motto of his life, *Suaviter in modo, fortiter in re*, he introduced one reform after another. During the thirteen-year period of his administration he devoted himself especially to the rearrangement of an exhibition of the great collection of the primates, lemurs, monkeys and apes, but above all to the Synoptic Mammal Hall of the classification, habits and outstanding characters of representatives of various orders of mammals. Here, with the aid of William King Gregory and the occasional suggestion of the present writer, he built his most enduring monument, for no one will ever find it necessary or advisable to substantially alter his beautiful and expressive arrangement of the Mammalia and of their characteristic organs. It is a matter of historic justice, therefore, for our Trustees to name this synoptic exhibition Lucas Hall and to associate it perpetually with the name of a man of fine personal character, of quaint and persuasive charm, representative of the finest principles and endowments of the New England character.

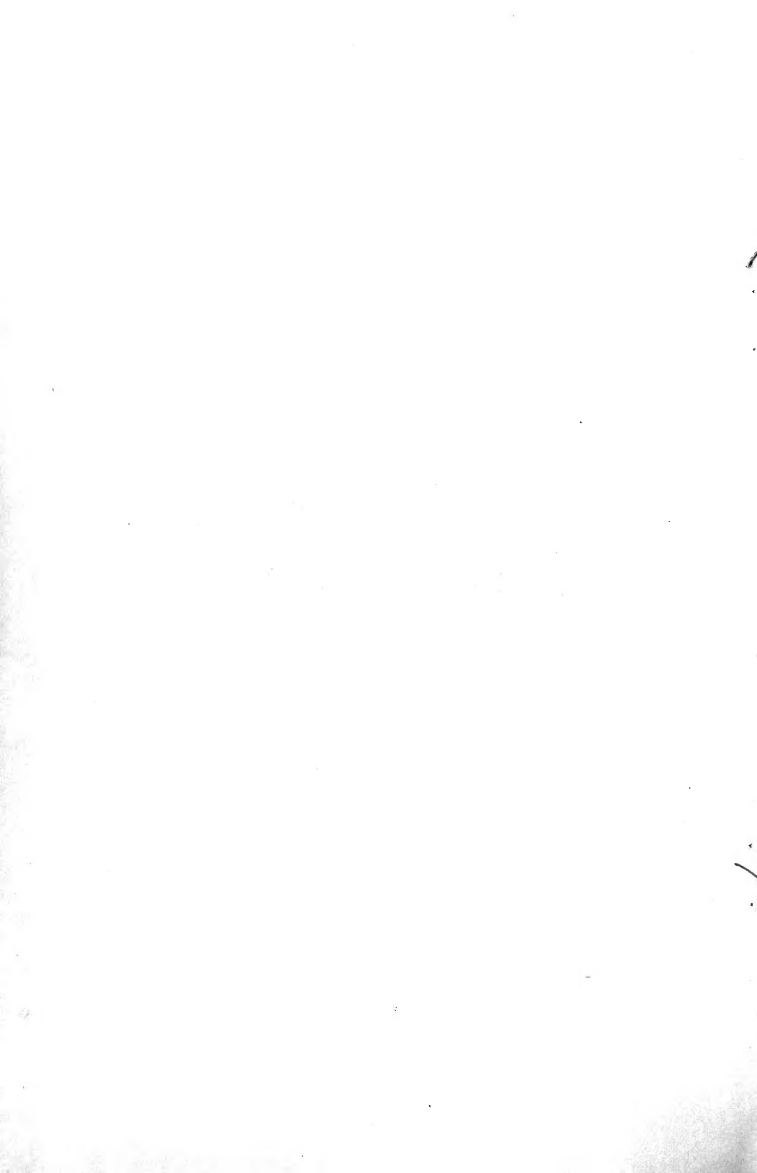
HENRY FAIRFIELD OSBORN.

*Castle Rock,
Garrison-on-Hudson,
December 30, 1932.*

DEDICATION

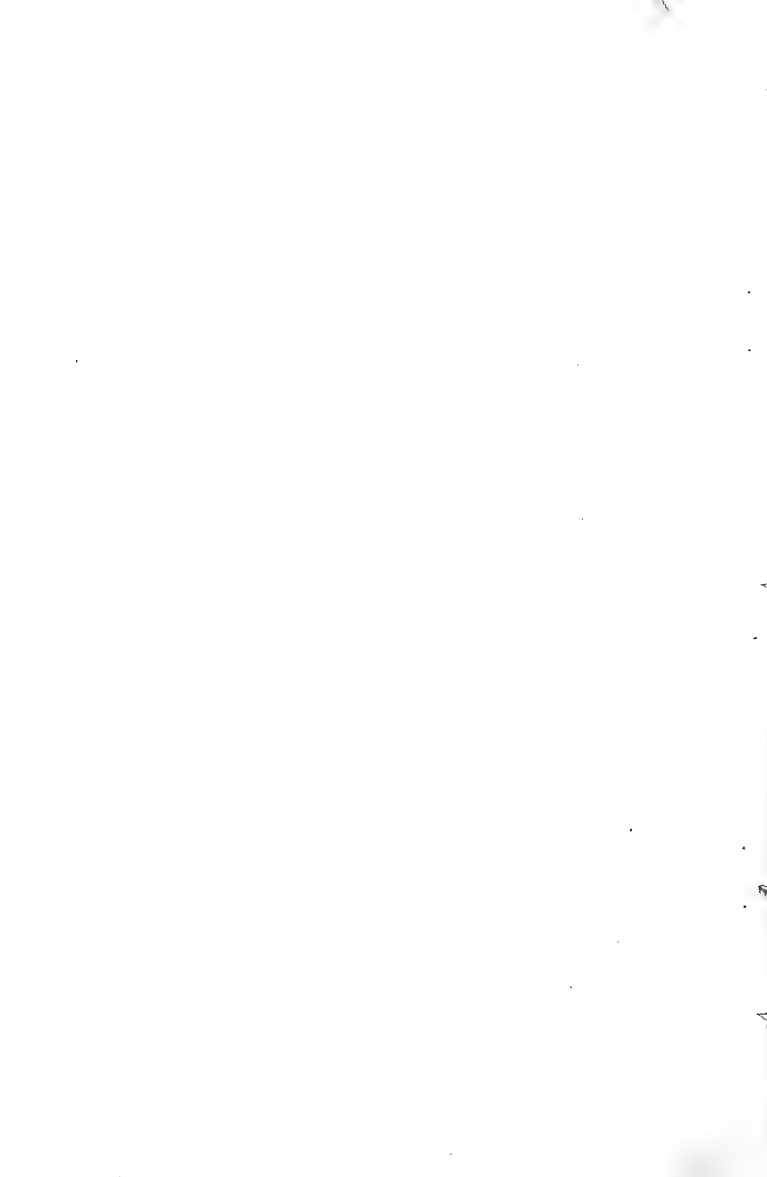
To my colleagues and fellow workers, past and present, those still here and those who have passed into the great beyond, this volume is dedicated in memory of "the good old times."

"God be thanked, whate'er comes after,
I have lived and toiled with men."



INTRODUCTORY

It is due to the kind suggestion of President Henry Fairfield Osborn and to his continued encouragement that these reminiscences were written and I am indebted to him and to the other Trustees of The American Museum of Natural History for the privilege of publishing them, and for this privilege I tender my sincere thanks.



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DR. LUCAS'S BIRTHPLACE, PLYMOUTH, MASSACHUSETTS

WARD'S NATURAL SCIENCE ESTABLISHMENT

COLLEAGUES AT WARD'S ESTABLISHMENT

BERING SEA COMMISSION OF 1896-1897: ON BOARD U. S. S. ALBATROSS

FIFTY YEARS OF MUSEUM WORK
Autobiography, Unpublished Papers, and Bibliography of
Frederic A. Lucas, Sc. D.



FIFTY YEARS OF MUSEUM WORK

It is seldom that one follows a given occupation uninterruptedly for fifty years. Our first work, like our first love, is apt to be of a transitory nature, and usually, "in his time one man plays many parts."

But it has happened that so far my entire life has been passed either in practical preparation for museum work or in its execution, in various lines from preparator to director.

The main facts of this half century of work are briefly given in that useful and much used work, "Who's Who in America." The record there is as follows:

LUCAS, FREDERIC AUGUSTUS, director; b. at Plymouth, Mass., Mar. 25, 1852; s. Augustus Henry and Eliza (Oliver) L.; pub. sch. edn.; (Sc.D., U. of Pittsburgh, 1909); m. Annie J. Edgar, of Rochester, N. Y., Feb. 13, 1884. Asst., Ward's Natural Science Establishment, Rochester, N. Y., 1871-82; osteologist, 1882-7, asst. curator div. comparative anatomy, 1887-93, curator, 1893-1904, U. S. Nat. Mus.; curator-in-chief museums of Brooklyn Institute of Arts and Sciences, 1904-11; director, American Museum of Natural History, New York, June 15, 1911-Dec. 31, 1923; Honorary Director, Jan. 1, 1924-Feb. 9, 1929. Mem. commn. to investigate condition of fur seal herd of Pribilof Islands, 1896-97. Fellow American Ornithologists' Union, N. Y. Academy of Sciences; mem. Museums Association of Great Britain, Biol. Soc. Washington,¹ Am. Museums Assoc.; corr. mem. Zoöl. Soc. London; hon. mem. Calif. Acad. Sciences; fellow N. Y. Zoöl. Soc. Clubs: Authors,¹ Explorers. Has written various papers on anatomy of birds, fossil vertebrates and museum methods. Author: *Animals of the Past*, 1901; *Animals Before Man in North America*, 1902.

To this may be added:

Charter Member of the Association of American Anatomists and of the Washington Academy of Sciences, Foreign Member of the Zoological Society of London, Life Member of the American Museum of Natural History, Colaborador de la Dirección de Estudios Biológicos, Secretaria de Estado y del Despacho de Fomento, Colonización é Industria, República Mexicana.

Contributed numerous articles to Johnson's Cyclopaedia and special articles to the International Encyclopaedia and Encyclopaedia Americana; made many illustrations for first edition of the Century Dictionary; collaborator in revision and supplement to Century Dictionary, in Vertebrate Zoology, Comparative Anatomy and Palaeontology; Associate Editor of Champlin's Young Folks' Natural History; Article Aves in the English translation of Zittel's Textbook of Palaeontology, 1902; Chapter on the Anatomy of Birds in Knowlton and Ridgway's "Birds of the World."

Among other positions held are those of President of the Society of American Taxidermists, President of the Biological Society of Washington, President of the American Association of Museums, Vice-President of the National Association of Audubon Societies.

¹Since resigned.

These briefly stated facts will be amplified in places, mainly with a view to showing just what were the circumstances that led to my taking up, and continuing to follow, a museum career.

The question is often asked, "What is the proper training for a museum man, what should he study, what should he do, how can one secure a position in a museum?" and some attempts have been made to answer these questions by establishing museum courses.

Personally, I doubt the possibility of creating a race of museum men any more than that of creating a race of writers. Just as no course in English literature, be it never so good, will *create* a writer, so no course in museum methods will make a curator; it may give him training and development but the ability must be there at the outset. Natural aptitude counts far more than training, and the ability to translate facts into exhibits and labels, and to do it in an interesting manner, cannot be taught.

These "reminiscences" may show how one individual became a Museum Man, but that they will throw any light on the general proposition of what is the proper training for museum work and how one can secure a position in a museum is doubtful.

There is no one word that covers the term, "Museum Man," borrowed from Doctor Goode and used here. It means a man gifted with a natural aptitude for museum work, one who can plan, install and label exhibits, care for the collections in his charge and do something with the means and material at his disposal, no matter how limited these may be:¹ one who has for his motto the words of Roosevelt, "DO WHAT YOU CAN, WHERE YOU ARE, WITH WHAT YOU HAVE." The term, "Museum Man," is by no means synonymous with Curator, for not every Museum Man is a Curator and many a Curator is very far from being a Museum Man.

It is possibly due to my own experience that I feel that among the qualifications for a "Museum Man," mere education—and education is not knowledge—is apt to be overestimated, and mechanical skill, the ability to do things, underestimated.

Administrative ability, the power to plan and direct, is another matter; like the poet, the administrator is born, not made, and is in turn distinct from executive ability, the power to carry out the plans of another. Though frequently, if not usually, confounded, they are really quite distinct.

¹In this connection, I recall a remark of Doctor Goode's that an interesting exhibit could be made of a row of bricks—and it can—or if not interesting, at least instructive.

1852-1871

To begin with, I was fortunate in my birthplace; sixty years ago Plymouth was a most excellent place for a boy to live and learn and play. It was unspoiled by the march of so-called improvements and not, as now, overcrowded; the bulk of the population spoke English and was American.

Plymouth was then a town of about 7500 inhabitants, given over to a variety of industries, none of which was large enough to change the character of the population or affect natural conditions. Town Brook, as in the days of the Pilgrims, was a stream of sweet water, habitable for fishes from source to outlet; one could bathe in any part of the harbor without emerging dirtier than when one went in, and the mechanics in the various mills and factories were all Americans.

The Cedar Swamp by Billington Sea had all the mystery of a tropical jungle—and was almost as impenetrable—and the pine hills of Manomet seemed distant and inaccessible. At "half tide" seals in numbers hauled out on Seal Rocks, or at low water, lined the edge of White Flat or Goose Point Channel, and piping plovers bred on the beach.

All in all, Plymouth was a good place for a boy to learn to swim and row and coast and skate and shoot and fish, and "in between times" the public schools offered a very fair education which could be supplemented by visits to factories and workshops.

Today Plymouth bears all the unpleasant evidences of growth and prosperity; mills and factories have multiplied; the workmen employed therein speak any language save English; Town Brook is silted up in places and in general so polluted that nothing can live in it, and on a quiet day the waters of the harbor glisten with oil from power houses and motor boats, and one has to wait for an off-shore wind to make bathing pleasant.

The swamps that harbored the luscious huckleberry have given place to monotonous, and sometimes remunerative, cranberry bogs, whose crops, when spared by drouth and frost and bugs, are gathered by Bravas to whom English is an unknown tongue.

Nevertheless, it is still a pretty good abiding place, and if one feels dissatisfied, a few hours in a town like Fall River enables one to be resigned if not content.

Here, with exceptions to be noted, were passed eighteen pleasant years. As a boy I had an easy time, a fact that strangely enough I realized, and had no longing for the time when I should be "my own master," an ironical term that usually means someone's servant.

The public schools were of the usual type of fifty or sixty years ago, giving what I still feel to be a rather practical training for the needs of nineteen out of twenty average men and women. There was little or no attempt to make studies interesting and this was particularly true of geography and history, the latter of which I abandoned for Latin as soon as opportunity offered. A little more than three years of Latin gave me a smattering that became useful later on when I had to deal with scientific names, and I mastered a few elementary principles of grammar—since forgotten. English grammar I studied for two years in the parrot fashion then in vogue, without understanding anything more about it than Chimmie Fadden did of politics. "Physical Geography" I acquired off-hand by simply reading it over, but geography proper, "as she was taught," I hated, though it served a purpose.

A year of French proved to be very useful in later years; a year of Greek I consider as misspent time. I have read with awe and admiration Huxley's remarks on what he considered only a *fair* education.

There were few "nature books" in those days, but in the grammar grade we had Youman's *Child's Book of Nature* read to us once or twice a week for a year.

I collected bird skins, birds' eggs, insects and postage stamps in a desultory manner, not with any particular end in view but simply because they were interesting occupations, and went fishing as often as I could—which I still do, though unhappily the opportunity so to do comes but seldom.

It was a matter of keen regret with me that I was "a duffer" so far as athletics went. I skated, coasted, swam, played ball and later on shot, but never well. I could not turn a handspring nor do the least bit of fancy skating, and in baseball the right field always fell to my lot. The curious fact is, I was fairly good at mechanics and though never first class, decidedly more handy with tools than the great majority of my associates, and this mechanical ability had a great influence on my career.

Three years—two long voyages, 1861–62 and 1869–70, and two short ones—were spent at sea, for these were the good days of sailing ships when a Captain was allowed to take his family with him, and on these voyages I picked up a little practical knowledge of geography, made the acquaintance of a few beasts, birds and fishes, and saw enough of a sailor's life to determine me never to be one. To some these years might appear wasted but it was a period of life when time was not so important as

later on, and not only did the information incidentally gathered subsequently prove important,—but for these voyages our little family would rarely have been together. Some of them really count for little, two, from Philadelphia to Liverpool and back, being made when I was respectively six and seven years of age, those being the days of sailing packets. My father commanded the "Stalwart," voyaging between Philadelphia and Liverpool, carrying over corn and, incidentally, rocking-chairs and corn broom for friends, and bringing back emigrants and a few horses and cattle. So it chanced that my earliest riding was aboard ship when the ponies were being exercised in fine weather.

My first long voyage was made in 1861-62, from New York to San Francisco, Japan, China and around the Cape of Good Hope back to New York, barely escaping the Confederate Cruiser "Florida" which was intercepting and destroying our clipper ships. The date 1861 means little or nothing to the present generation, but it was the year of the commencement of the Civil War and New York saw much of the preparation for it. City Hall Park was filled with temporary wooden barracks and drill squads were continually at work, and in company with thousands of others, I watched the Seventh Regiment and, later, the "Gallant Sixty-ninth" leave for the front.

I spent many hours at the window of the United States Hotel in New York looking toward Fulton Ferry and admiring the gaily painted omnibuses. Fifty years later, when Curator-in-Chief of the Brooklyn Museum, I was to learn that the pretty landscapes that decorated their sides were the work of a struggling artist, John Quidor, whose largest work was then in that institution.

This voyage took me quite around the world and accustomed me to being at sea for months at a time, so that to be told of a "long voyage" of twelve days always makes me smile.

Yokohama was one of the ports visited, and Europeans were such rare objects at that date (1861) that going up the Bay of Yedo we were fairly mobbed by fishing boats whose occupants had never before seen a white woman and child. In Yokohama I was frequently followed about the streets by clusters of people to whom a white boy with red hair was a curiosity, and on several occasions it fell to me to kneel with others at the roadside while some Daimio with his retinue passed—all of which makes me realize the flight of time.

There were interesting experiences, too, at Shanghai: the Tae-ping rebellion was in full blast and on our way up the river we passed blazing villages, while it was a common sight to see some corpse drifting down

with the current. Also while at Shanghai, the French Admiral, on a trip up the river to the scene of conflict, was shot by the rebels, and the salutes fired by various warships on the day of the funeral suggested a second Fourth of July.

There were other interesting episodes! One day the boiler of a river steamer blew up on her trial trip, with great damage to the vessel and the loss of many lives, and on another occasion a passenger steamer caught fire and drifted blazing through the fleet of ships at anchor, the most exciting moment being when she came alongside the frigate "Imperieuse" which was engaged in taking in a supply of powder. All of which was great "fun" for a ten-year-old boy whose father fortunately remembered that he too had been a boy once and took his son with him to these scenes of disaster.

My second long voyage was of far greater importance as its termination coincided with the return of the mining engineer whose acquaintance with Professor Ward was the determinant factor in my career. This voyage occupied eighteen months in 1869-70 and took me from Boston to Valparaiso, Callao, the Chincha Islands, where we spent three months, to London and back to Boston. Some of the happenings on this voyage are noted in the article, "The Chincha Islands Fifty Years Ago."¹ The ship's carpenter allowed me the use of tools and in his shop I skinned birds and imparted to him the rudiments of taxidermy. The knowledge of knots and ropes and purchases and how to handle heavy objects has more than once been most valuable. Furthermore I learned the importance of being on time under conditions where, on occasion, punctuality might be enforced by a bucket of cold water or by the stimulating application of a rope's end.

The close of my last voyage, November, 1870, found me eighteen years old and confronted with the difficult and more or less unpleasant problem of deciding what to do for a living. And now came into play those apparently fortuitous circumstances previously hinted at. As these events did not happen consecutively they cannot be recorded in orderly sequence, but simply are set down as so many items from which the reader can make his own combination.

We speak of the *choice* of a profession but really in most cases our occupations are chosen for us by circumstances quite beyond our control, often seemingly of no importance or as having no direct bearing on the problem in hand.

¹"The Chincha Islands Fifty Years Ago." Brooklyn Museum Quarterly, 1921, vol. 5, pp. 1-9. Reprinted in *Bird Islands of Peru* by Robert Cushman Murphy, 1925.

This is particularly true of my own case; I had not the slightest idea or intention of passing my life in a museum or in museum work, and that I came to do so was the result of a train of circumstances with which I had little to do, largely out of my control and whose import I did not recognize.

We speak truly of a combination of circumstances, for like an old-fashioned Chinese puzzle in which a number of apparently unrelated pieces are fitted together to make some definite figure, so a number of trivial events, seemingly having no connection one with the other, combine to have a very definite and important influence on our careers. I had an ambition to be a taxidermist and collector of birds, an ambition due to the fact that I had an uncle who was an amateur (and as I came to realize a very indifferent) taxidermist, and "stuffing birds" seemed to me a very pleasant and easy way of earning a livelihood. My uncle obtained *his* knowledge of taxidermy from Prof. J. W. P. Jenks of Peirce Academy, Middleboro, later of Brown University, and the small Museum at the Academy was the primary, if not the prime, factor in determining that I should become a museum worker. It may be noted that Louis Agassiz called attention to this museum as a noteworthy example of what might be accomplished in a small community.

1871-1882

That I went to Ward's Establishment was another, and doubtless the most important, factor in my life and my going there was due to the fact that we had for a friend a mining engineer who had met Professor Ward in Montana. If this friend had not known Professor Ward and if he had not been at home just at the time it became necessary for me to think seriously of doing something, there is no telling where I might be now or what I might be doing. As it was, while I was considering whether I should enter a machine shop or endeavor to take a course in the Massachusetts Institute of Technology, the problem was solved by the suggestion of Mr. Hodge that "Ward's was the place for me." My father wrote Professor Ward that he had a boy whose chief desire seemed to be to skin snakes,—had he any use for such a specimen? This was really not quite fair (parents do not always properly appreciate their offspring), because my ambition was to become a taxidermist.

So it came to pass that early in January, 1871, I landed in the overgrown town of Rochester¹ and began work at Ward's Natural Science

¹Possibly Rochesterians of the present day may resent this term, but the Rochester of 1871 had no waterworks and no sewers, the streets were mostly of dirt and the sidewalks of wood, the four street-car lines ran a "bob-tailed" car from "the four corners" every half hour, and a large portion of the population "traded" at Sample's grocery.

Establishment which was to be my abiding place for the next eleven years.

Ward's Natural Science Establishment was then fairly started on the second stage in its career, the first having terminated when the building erected in the rear of Rochester University was destroyed by fire.

At the time of my arrival there were but three buildings, "Cosmos Hall," used for taxidermy and skeleton work, a casting shop, and combined paint shop, carpenter shop and storage.

From time to time a building or a shed was added until there was a little hamlet of about fifteen buildings and sheds, and the working force was increased from five to as many as twenty-two. It was a little community in itself, a polyglot community, including American, French, German and Italian employees, each of whom was an expert in some branch of preparatory or mechanical work, such as taxidermy, osteology, plaster work, carpentry or blacksmithing. The establishment adjoined an orchard whose trees from time to time were drawn on to furnish branches for all sorts of arboreal animals from all parts of the world and a goodly share of them are still doing duty in the Primates Hall of the American Museum of Natural History.

Eleven years at "Ward's" furnished excellent training—or rather offered opportunities for training—for work in a large museum. I say offered, because had the opportunities not been embraced, they would have availed nothing, a point that some of our younger men fail to appreciate. But, due to a liking for mechanical work, I spent many an evening in mastering the mounting of crustaceans, small birds, and other branches of preparatory work; such practical matters as making boxes and packing all sorts of objects—from elephants to humming-birds, plaster casts and skeletons—came to me as part of the regular day's work.

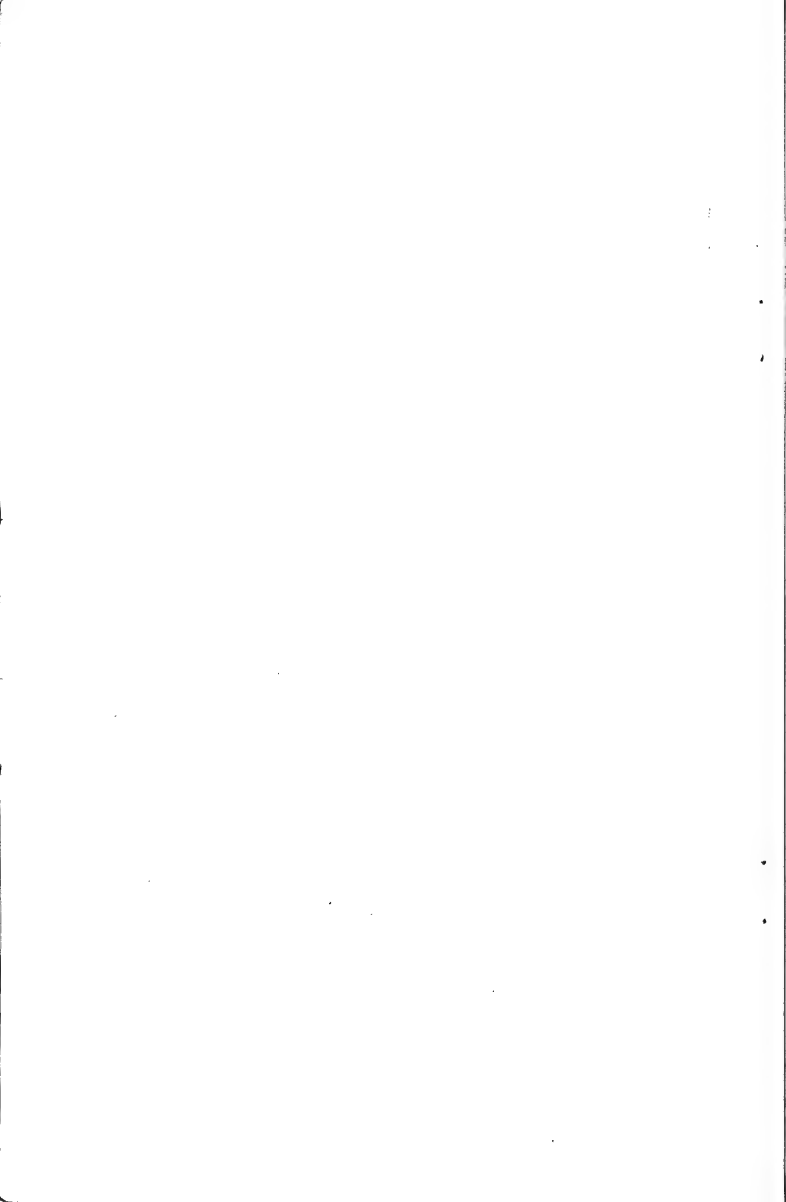
To paraphrase Clare Briggs, those were the days of real work, days of nine or ten hours and even more, commencing at seven, winter or summer, and ending at five or six. All the time after that was ours to play or work as we chose. There were no holidays, no sick leave; we were paid for every hour we worked and no more! We were not paid to learn how to do things; we learned on our own time and by our own efforts and if we wished to try any experiments in new methods of work, we tried them at our own expense.

It is perhaps owing to the years of work at Ward's that I cannot help feeling a certain intolerance for the highly specialized preparators of today. They seem so limited in the things they can do, so helpless



Photo by Clyde Fisher

BIRTHPLACE OF FREDERIC A. LUCAS
PLYMOUTH, MASSACHUSETTS



when it comes to making a temporary pedestal, putting up a shelf, packing a box or doing anything not strictly in their line. The motto at Ward's was *viam inveniam, aut faciam*: "I will either find or make a way."

Of course this *is* the age of specialization, but it does seem as if there was too much of it, and just as some of us lament the disappearance of the old-time "all-round" naturalist, so "old-timers" like Hornaday, Akeley and myself grieve over the helplessness of the modern preparator, his dread of working over time, his frequent inability to be on time, and his readiness to make up for being late by quitting early. We worked a dozen hours a day and then went home to work for ourselves or took our best girl to the theatre. We heard nothing in those days of the artistic temperament—we heard more of laziness or general cussedness.

Also, in my desire to become a skilled preparator, I took advantage of Professor Ward's long absences to acquaint myself with still other branches of preparatory work and particularly the mounting of skeletons, a matter that had a most important influence on my future.

There were but two preparators in those early days, one an osteologist by the name of Roch. When I, representing unskilled labor, was detailed to cut up a pig, skilled labor promptly quit work and while the matter was adjusted temporarily, the result was, fortunately for me, that later Roch literally if not metaphorically took French leave, a step fraught with much more importance than appears on the face of it. The place left vacant by Roch was filled a little later by a skilled and genial French preparator named Bailly, a pupil of the naturalist and African traveler, Jules Verreaux.

Jules François Desirée Bailly was trained in the Maison Verreaux and had come to Philadelphia as general preparator for the Pennsylvania General Hospital. He was a skilled osteologist, and a fair general taxidermist. Also he was an expert mounter of frogs in grotesque attitudes, an art that had aroused my interest as a small boy in New York, where a number of them displayed in a window on Broadway shared my attention with the hundred-bladed knife shown in the old Astor House.

Bailly was a type of preparator rare in those days, in that he was quite ready to impart his knowledge and skill to any one willing to devote time to its acquisition, and under his supervision were trained a number of deft-handed preparators whose work may be seen in almost any of our larger institutions. He was willing to impart his knowledge and skill to others and willing to give his own time to do this. The first was a rare quality in the preparator of fifty years ago, the latter

an extremely rare quality today. It is not too much to say that the excellent quality of skeletal preparations in our great museums is directly due to the pupils trained by Bailly, and the general advance in taxidermy largely the result of his liberal-mindedness.

It is indeed a small world, and the invisible threads of our lives and careers are inextricably mixed: Had I not gone to Rochester, Roch, the osteologist, would not have left; had he not left, Bailly would not have come to the Establishment; had he not come, there would have been no one ever ready to instruct the young preparators and transmit his skill to others. And so the cutting up of a small pig led to the fine anatomical collection in the National Museum. And, in looking at these collections, as well as those of Cambridge and Chicago, and elsewhere, it should be borne in mind that their high standard of excellence should be largely credited to Jules Bailly.

But, there were other opportunities at "Ward's" than those for acquiring a knowledge of preparatory work and perfecting oneself, so to speak, in the mechanical side of natural history, and one of the greatest of these opportunities was that of handling zoological material of all kinds, particularly skeletal material. Sorting over the contents of a maceration barrel comprising two or three skeletons was the best possible training in comparative anatomy and a most excellent foundation for work in palæontology, which, through force of circumstances, fell to me later. I tried reading various text-books on zoology but soon grew tired of it as there seemed to be no direct relation between them and the work in hand. So it has come to pass that I have never read through any scientific text-book, never attended a course of scientific lectures, never done an hour's laboratory work nor made a single microscope slide. And up to the time I went to Washington, I had little knowledge of the principles of classification as applied to any group of animals, not even birds. I did have an excellent practical acquaintance with bones.

An order from the Museum of Comparative Zoology for Mammals and Birds, illustrating the fauna of the great zoological regions of the world, afforded an unusual chance to get acquainted with these groups of vertebrates, and in the course of this work, I had the pleasure of making the acquaintance of Doctor J. A. Allen—then a young man, now but recently passed away, and a little later, through his aid, I published my first scientific paper, on the species of Bornean oranges.

Our museums have an enviable reputation for the manner in which they hold the mirror up to Nature, and yet I feel that the Establishment may justly claim a large share of the credit for this.

The expeditions sent out by our museums to gather specimens were foreshadowed by those made for the Establishment, notably by Mr. Hornaday's two years' trip around the globe, an expedition made by one man, with very limited expenditure of money, with results, considering men and money, that have never been equalled.

And the popular publications of our museums had their prototype in *Ward's Natural Science Bulletin*. It was started as an advertising sheet, it is true, and it had an erratic existence of only six years, but it had a distinguished corps of contributors and to this day I refer to its pages for original and important information.

There were no typewriters in those days and articles were written in leisure moments when we were working nine and ten hours a day—also we were our own artists, though perhaps that term may seem a little flattering to those who have seen the pictures.

Even play proved to be profitable and participation in the diversions of the "Shakesporean Club" taught me to speak slowly and to face my audience, no matter how small; later on I took to heart Doctor Mason's admonition to talk to the people in the back seats and Professor Bickmore's remark that he never used a word of many syllables when two or three good, short Anglo-Saxon words would serve. All these are small matters, but too often neglected or not thought of by amateur speakers, or writers.

We naturally estimate the value of any institution, be it commercial or educational, by the quality or quantity of the output. And as colleges "point with pride" to the number of important positions occupied by their graduates, so the Ward Establishment may vaunt itself upon the number and importance of the places now held by men who derived a part of their training within its walls. And I doubt very much if any university can show so large a percentage of its graduates occupying positions of responsibility and engaged in valuable educational work. Its graduates include directors of three museums, the great Zoological Park of New York, the New York Aquarium, three college professors, the chief preparators of four of our greatest museums and many occupants of positions in other scientific institutions.¹

¹Doctor Lucas prepared the following uncompleted notes on graduates of the Ward Establishment: Members of the Ward Establishment who have been instrumental in the development of museum methods or technique or whose stay at the Establishment had an influence on their subsequent career: Akeley, Carl E.,* Taxidermist, Collector, Inventor, Sculptor. Ward's, 1883-1887, Field Museum of Natural History, 1895-1909, American Museum of Natural History, 1909-1926, since 1921 in an advisory capacity.
Baker, Arthur B., Ward's, 1879-1882, Supt. Public Schools, Trego Co., Kansas, 1887-1890. Since 1904 Asst. Supt. Natl. Zool. Park, Washington.
Baker, Frank Collins, Ward's, 1890-1893, Curator, Chicago Acad. Sci., 1894-1915, N. Y. State College of Forestry, 1915-1917, Curator, Mus. Nat. Hist., Univ. of Ill. since 1918.
*Deceased

I do not say that Ward's *made* these men what they are but it was a large determining factor in shaping their careers, even when their stay at the Establishment was of comparatively brief duration.

We all have an admiration for martyrs, however little we may wish to play the rôle ourselves, and while the Ward Establishment may not have been profitable for its founder and immediate supporters, yet it certainly has played no small part in the development of our museums and other scientific institutions.

It was during my stay at "Ward's" that the next determinant factor in my museum career came into play: the Society of American Taxidermists.

Like myself, Mr. Hornaday "once upon a time" had a desire to be a great taxidermist—a desire which he lived to see gratified. Incidentally there came a time when he felt that one great taxidermist was not enough for a continent—there should be others. So the Society of American Taxidermists was founded. Here, I fear me, I was a thorn in the spirit, for I played the rôle, as well as a mere man can, of Cassandra, that well-meaning but most misunderstood young lady of Troy. Like her, I had the inestimable if dangerous privilege of saying "I told you so," only I didn't have to wait quite so long nor pay so high a price for the privilege. In other words, I foresaw that the Society would be short-

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- Barrows, Walter B.,* Ward's, 1876-1879. Instructor in physics and chemistry Colegio Nacional, Concepcion del Uruguay, Argentine Republic, S. A., 1879-1881, Instructor in Science, Mass. State Normal School, Westfield, Mass., 1881-1882, Instructor in Biology, Wesleyan University, Middletown, Conn., 1882-1886, Instructor in Botany, Trinity College, Hartford, Conn., 1884-1886, First Asst. Ornithologist, U. S. Dept. of Agriculture, 1886-1894, Professor of Zoology and Physiology, Michigan Agricultural College, East Lansing, Mich., since 1894.
- Bull, Charles Livingston, Artist, Author. Ward's, 1891-1893, U. S. Natl. Mus., 1893. Since then artist and illustrator, specialty, animals.
- Cherrie, George K., Explorer. Ward's, 1884-1885. Field explorer for the Brooklyn Museum in Costa Rica and South America.
- Critchley, J. William,* Ward's, 1876-1884 approximately. For some time in business as commercial taxidermist. After 1903 Chief Taxidermist, Museum of the Brooklyn Institute of Arts and Sciences.
- Denslow, H. C., Taxidermist, Artist, Ward's, 1883-1887; 1892-1893. Taxidermist, Field Museum of Natural History, 1898-1900; Amer. Mus. of Nat. Hist., 1900-1907; since Artist, specialty, birds.
- Gilbert, Grove Karl,* Geologist, U. S. Geol. Surv'y. Associated with the Establishment in its earlier days.
- Gueret, Edmond N., Ward's, 1875-1900, Osteologist, Field Museum of Natural History, 1900, Asst. Curator, in charge Division of Osteology, since 1906.
- Hornaday, William T., Taxidermist, Field Naturalist, Conservationist, Ward's, 1874-1881. Chief Taxidermist, U. S. Natl. Mus., 1882-1890, Director, N. Y. Zoological Park, 1896-1926.
- Santens, Remie and Joseph, Taxidermists.
- Scolliek, J. W., Ward's, 1873-1883. Since 1883 at U. S. National Museum as special osteological preparator.
- Townsend, Charles H., Zoologist. Ward's, 1880; U. S. Fish Commission, 1883-1902; Director, N. Y. Aquarium, 1902.
- Turner, George B., Ward's, 1883-1886 and at intervals from 1887 to 1892. Chief Taxidermist, U. S. National Museum, 1900-1915.
- Ward, Henry L., Ward's, 1884-1886, 1891-1902. Osteologist, Geographical and Exploring Commission of Mexico, 1887-1891, Director, Public Museum, City of Milwaukee, 1902-1920, Director, Kent Scientific Museum, Grand Rapids, Mich., since 1922.
- Webster, Frederick S., Ward's, 1877-1887, Preparator-in-Chief, Carnegie Museum, Pittsburgh, 1897-1908, First President Society of American Taxidermists.
- Wheeler, William M., Ward's, 1884-1885, Curator, Public Museum, City of Milwaukee, 1887-1890, Curator of Invertebrate Zoology, Amer. Mus. of Nat. Hist., 1903-1908, Professor of Economic Entomology, Bussey Institution, Harvard University, since 1908.
- Wood, Nelson R.,* Ward's, 1877-1887. Taxidermist, birds, U. S. National Museum, 1888-1920.

lived, and after a brief but extremely active existence of three years, it succumbed to that most deadly disease, force of circumstances, and died. But its purpose had been accomplished—men die, institutions pass out of existence, but ideas live. And the stimulus given to what was most literally the stuffing of animals, has resulted in such work as the beautiful bird groups in the American Museum and elsewhere.

As one of the results of the activities of the Society, Mr. Hornaday was called to Washington to be Chief Taxidermist of the U. S. National Museum, and a little later I followed as Osteologist and on June 1, 1882, began the second period of my career, working *in* instead of *for* a Museum.

1882-1904

It was my good fortune to go to the U. S. National Museum at the time it was beginning to occupy the building designed by General Meigs, when the process of selection from the heterogeneous mass of material received from the Centennial Exhibition of 1876 was going on, the exhibits of the various departments commencing to take shape, and chaos was giving way to mere confusion. It was then possible to try experiments in installation and exhibition that would not have been feasible in an older institution.

The Museum had been used for the Garfield Inaugural Ball and for some years the checking boxes put up in some of the courts made convenient storage places.

While the museum building was very ugly and everywhere looks had been sacrificed to economy of construction, so that it resembled nothing so much as a huge car-barn, yet General Meigs had successfully solved the problems given him in the way of light, exhibition space on one floor and provision for offices. That there was not enough work-room and storage space was not his fault nor the fault of anybody. No one at that time realized to what proportions study series would grow nor the great amount of preparation work that would be carried on in large public museums. The taxidermists and other preparators were accommodated in a large shed just outside the museum which also contained a carpenter shop. Later another large shed was erected for exposition work and still later a large part of the museum reserve collections and some of the workrooms were transferred to sheds and buildings a quarter of a mile away, where by a special providence they were not destroyed by fire. Few preparators today realize the wholly inadequate quarters in which many of their predecessors have been housed, but even today the need of space for the work of preparation is not recognized

and our largest and newest museums are obliged to get along without due provision for it.

It was my greatest good fortune to serve under Doctor George Brown Goode whose influence on the museums of America may be compared to that of Flower on the museums of England. Like Flower, he early recognized the educational possibilities of museums and the importance of making them interesting and attractive to the general public. One of his favorite maxims was to keep ever in mind the human interest in any exhibit, to show just how and where it touched man directly. And under his direction the U. S. National Museum, and the various expositions in which it took part, exerted a great influence on the museums of the country and particularly on those that came into being later on, after 1880.

Goode, then a young man, was kindly in disposition, democratic in principle, keen of intellect and fertile in suggestion. Ever appreciative of the work of others, he was always ready to assist them by any means in his power.

He took great interest in museum work and was a frequent visitor to the rooms where it was carried on—often accompanied by Professor Baird. Like Flower, he was not afraid of doing things with his own hands, and to see him with his coat off, sorting over boxes of material, assigning this to the junk heap, that to the preparator and the other to storage, was encouraging to the younger members of the force. His interest in new problems, his desire to take up new work, led him to undertake more than he was physically able to carry out and undoubtedly led him to work beyond his strength. Not only was he fertile in devising new exhibits or new methods of displaying them but he was always willing to listen to others who had views on those subjects and to discuss their plans.

As my own desires and ambitions had been (and are) to make a museum educational and interesting, I was naturally delighted to be in a place where these views were being put into practice and where I could see the principles of museum administration, installation and labeling being put into practical execution.

Few have possessed greater powers of analysis and classification as applied to exhibits and exhibitions than did Doctor Goode, and excellent examples of his ability in this line are to be found in the catalogues prepared for the Centennial Exhibition of 1876 and the London Fishery Exhibition of 1883.

Another most admirable example of his organizing and administrative abilities is the report on the Fisheries Industries of the United

States made in connection with the Tenth Census, probably the fullest and most valuable record of the history and condition of our fisheries ever made—or that ever will be made.

Also he was most excellent at organization and his plan for the organization and administration of the U. S. National Museum may well be studied by museum administrators.

Not unnaturally some defects appeared when theories were put into practice, and some modifications of rules became necessary when they were applied to varying conditions, but the underlying principles were sound.¹

At first Doctor Goode objected to placing casters on floor cases, on the ground that it implied their arrangement was not permanent. Later Doctor Goode wished that everything was on casters, for if there is any place to which the dictum, "There is nothing fixed that shall not be moved," applies, that place is a museum.

Doctor Goode believed in "doing things" or in having them done and in some cases his method of going directly to the man who was actually engaged upon a given piece of work instead of *through* his immediate superior would pain sticklers for routine. It was the *end* rather than the *means* he had in mind and his method generally resulted in getting the work accomplished.

An example of this was the Synoptic Series of Invertebrates shown at Chicago in 1893. This was not placed in any particular department and was installed by me, not because I had any knowledge of invertebrates, but because Doctor Goode thought that I could carry out his desires for such an exhibit; so instructions to do so were given directly to me and not to my superior officer.

To Doctor Goode is due, or largely due, the use of descriptive labels in natural history museums, including the employment of varying sizes of types according to the importance of the subject matter, the use of casts of fishes, batrachians, and reptiles, and the introduction of ethnological groups and groups of large mammals.

It may be said that some of these things were not new but their introduction in a great public museum was: a movement is often lost for want of a leader and it was Doctor Goode who was largely instrumental in overcoming the spirit of conservatism that opposed the adop-

¹For example, it seems difficult to improve on the system of registration and cataloging in use at the U. S. National Museum and this is always pointed out as a model to be followed for this most essential and important branch of museum work.

On the other hand, hard and fast rules for the sizes of labels were soon abandoned as it became evident that they could not be followed, that some labels were necessarily fuller and larger than others, so that objects side by side even, required different treatment.

tion of attractive features in such places as scientific museums. For example, the recognition of the educational value of animal groups by such an acknowledged authority as a government museum had much to do with their adoption by other institutions; once entrenched behind the bulwarks of high scientific authority, they began to find their way into all museums.

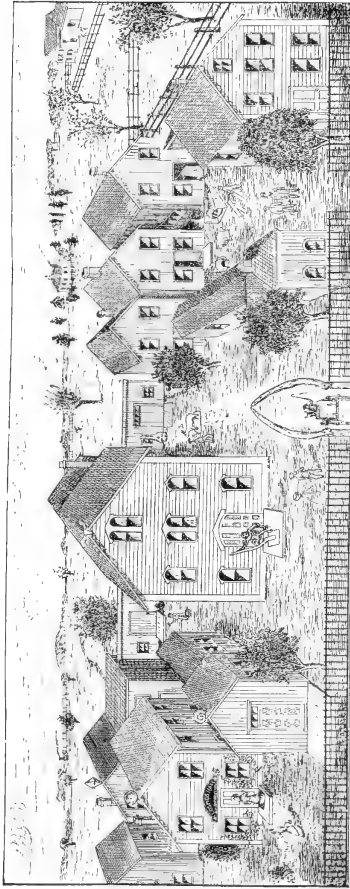
The American Museum of Natural History followed the lead of the British Museum in the matter of groups of birds, and the U. S. National Museum in installing groups of moose and bison; that, with due deference to those institutions, it went beyond them and took the lead in the popularizing of museum exhibits—and especially groups—is largely due to favoring conditions.

As for Professor Baird, then Secretary of the Smithsonian Institution, he naturally stands in a class by himself as a founder of institutions and enunciator of principles, while Goode was deviser of methods and systems.

Professor Baird, as well as Doctor Goode, took a direct interest in museum work of all kinds, mechanical as well as scientific, and together they made frequent visits to the workrooms and exhibition halls. Professor Baird was somewhat abrupt in manner but part of this seeming abruptness was merely an accompaniment to his promptness in deciding questions brought to his attention and to the fact that he had many and most important matters to decide; really he was most genial in disposition and simple in manner, readily accessible to all who wished to see him.

Joseph Henry had passed away before my day and my impression of him is second-hand but I cannot help feeling that he was not a particularly pleasant man, nor one of broad views, and that natural science in America owes much to Professor Baird's passive resistance and Fabian policy of waiting until opportunity came to carry out his own ideas. For example, Henry wished to dispose of the collections secured by the surveying expeditions, after they had been studied, while Baird wished to use them in building up a study series for the Museum that he hoped for and happily lived to see.

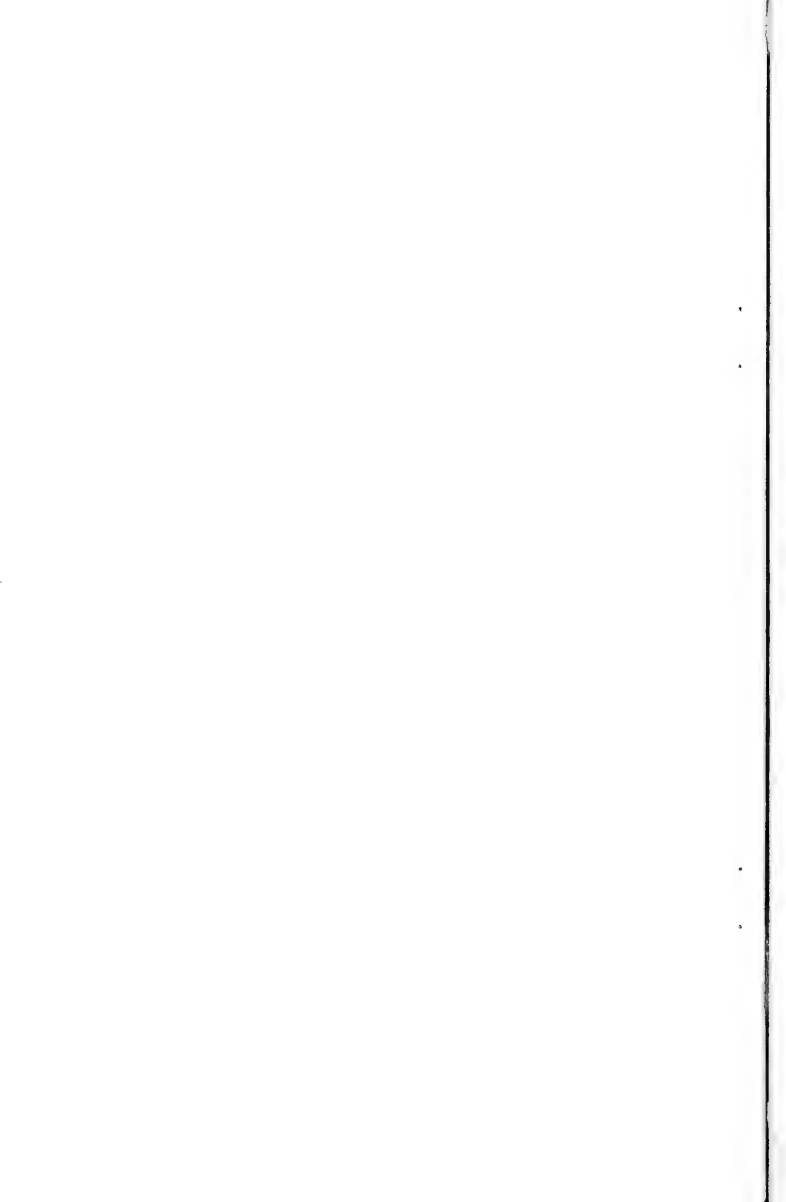
Professor Baird—whose death occurred during my absence on the expedition to Funk Island—was succeeded by Professor Langley, well known for his astronomical work and for his researches on the subject of flight. This latter problem occupied most of his time and thought and his interest in the Museum was incidental. Still, it was Professor Langley who in 1901 (or 1900) established the Children's Room in the Smithsonian, this being, so far as I am aware, the first definite provision made



Drawn by F. A. Lucas

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WARD'S NATURAL SCIENCE ESTABLISHMENT, ROCHESTER, NEW YORK



for children by any large museum. The motto of this room was *Knowledge Begins in Wonder*, very much like my own belief that if you wish to instruct the average visitor you must first arouse his interest. In 1902 I was placed in charge of the Children's Room, largely, I have always thought, because I suggested *How Animals Hide* as a substitute for Protective Coloration and Mimicry.

While Professor Langley was apt to be autocratic in manner, yet he was ever most courteous to me, taking pains to personally appoint me Curator of the Department of Comparative Anatomy.

Professor Langley believed in never taking a statement for granted; it must either be supported by evidence or investigated. Among other things, he even looked into the question of the existence of the hoop snake and it pleased him to show that a snake's skeleton *could* be bent dorsally almost into a circle. This frame of mind caused him to send me to Atlanta to investigate a "Mummied Cliff Dweller Giant," for while I was morally sure that this was a fake, I could not produce any facts to prove that this was the case. Professor Langley, too, was probably morally sure that the mummy in question was a fake, for he had promised two credulous anthropologists that he would purchase it if I pronounced it genuine. There was an excellent opportunity to investigate the giant which was reposing in the office of the sheriff, having been attached for debt in spite of the ingenious plea of the owner's lawyer that it was contrary to the laws of Georgia to seize a dead body for debt. I was able to report that the parchment clothing of the mummy was unsized paper, treated with glue, that the hair was jute and the incisors from a cow—transposed at that—and the specimen was not purchased.

Had not the U. S. National Museum been hampered not only by lack of funds but by restrictions as to their expenditures, it very probably would have taken the lead in museum methods under the administration of Doctor Goode. The bison and moose groups in the U. S. National Museum antedated those in the American Museum of Natural History and it was largely the experience gained by Jenness Richardson in the U. S. National Museum that led to their installation in the American Museum of Natural History. As it was, the younger institution, with ampler funds and greater space, installed the groups in the center of the North American Hall, which are still the largest of their kind and in many respects have never been equalled, let alone excelled.¹

Great progress has been made, especially in our newer museums, in the installation of habitat groups, of various kinds, but notably those of

¹The group of moose was mounted and installed by John Rowley.

mammals, during the ten years that have elapsed since the *Story of Museum Groups* was written. The most noteworthy among them are those prepared by Mr. John Rowley in the California Academy of Sciences, showing the characteristic large mammals of California. Not only are these groups not restricted in size but they have the great advantage of being installed in a hall planned and built for their display, points wherein Mr. Rowley has worked under conditions more favorable than those enjoyed by his predecessors.

Fishes, for reasons stated, still remain among the most difficult subjects for groups, but have been treated with good success both at the American Museum of Natural History and the Field Museum—and have been used in marine groups at the Brooklyn Museum. Marine groups of invertebrates, brought to a high degree of beauty and perfection under Dr. Miner, of the American Museum, really need to be considered by themselves as, of necessity, the animals are reproductions in wax and glass.

It is, too, a question if man, as a subject of groups, should not be treated apart since he calls for quite different handling from his four-footed relatives and must necessarily always appear in effigy. Single figures have been in use for many years for the display of costumes or illustrations of racial characters, but the United States National Museum was the first, to the best of my knowledge, to make "ethnic groups" a feature of its exhibits.

The Public Museum, Milwaukee, has placed on exhibition a number of groups illustrating the habits and habitats of the races of men found in North America, and in the State Museum at Albany has been installed a remarkably fine series of six groups devoted to special ceremonies of the Iroquois. Our own artistic and elaborate groups [American Museum] depict the daily life of the Hopi and Arapaho Indians while the Navajo Group includes a special ceremony, all carried out amid their natural surroundings.

A problem in connection with insects is to prevent the subjects from being overshadowed by their surroundings, but they have been "grouped" in various ways, from the small, square glass case, which may be likened to the original bird groups, to the fairly large and very successful life history groups recently (1925) installed in the American Museum of Natural History.

The importance now accorded groups is shown by the consideration given them in planning new museums and if due provision has not been made for them in some recent buildings it is due to the unfortunate

limitations in structural conditions or to the conservatism of architects. That "habitat groups" will form an essential feature of every important museum seems undoubted, but the question arises, though it is pronounced very timidly, if there is not some danger lest the matter of groups be overdone. Not every animal is worthy of inclusion in a habitat group and while it is the duty of a museum to present to the public Nature in her fairest forms, yet this should not be done to the exclusion of other important matters. Finally, it must not be thought that "habitat groups" are confined to the United States though that is the place of their origin and they are more numerous in our museums than elsewhere—there are fine groups abroad, notably in the museum at Upsala, and there will be more in the years to come.

Still more important has been the introduction and development of electric lighting, without which the proper display of such groups as are now found in our museums would not be possible.

What may be termed habitat groups in miniature are those used with much success by Mr. Figgins in which the back of the case is a colored, photographic transparency of the locality where the birds were taken. As a variant of this, Mr. Frank C. Baker, when at the Chicago Academy of Sciences, used greatly enlarged photographic curved backgrounds for the insects of the vicinity of Chicago.

For many years the attitude of the public towards the U. S. National Museum and Government institutions in general seemed to be that of the Congressman in "Sam Slick," whose motto was *dulce est pro patria mori*, which he translated: *mori*, the more I get, *pro patria*, from my country, *dulce est*, the sweeter it is. Not only are there greater restrictions in the use of funds in a government institution than in one under private control, but it is more difficult for such an institution to obtain funds from private sources. But there has been a wonderful change in the point of view during the past twenty years, and of late gifts have flowed into the U. S. National Museum in an ever-increasing stream, the value of art objects alone, presented during the decade ending 1920, amounting to \$6,000,000.00.

Congress was, and is, strangely illiberal in providing, or rather in *not* providing, either by direct purchase or by expeditions, funds for the acquisition of specimens by the National Museum, and only for a short time was even so small an amount as \$10,000 allowed for these purposes. The principal additions to the museum collections have been, as noted, through gifts from private individuals.

Aside from regular museum work, the various exhibitions and expositions in which the United States Government took an active part,

beginning with the London Fishery Exhibition of 1883 and ending—so far as I was personally concerned—with the Louisiana Purchase Exposition at St. Louis in 1904, offered unusual opportunities for experiment on a large scale and for putting into practice many theories of methods of display as well as for noting excellent examples of what *not* to do. Also, for devising exhibits that would include desirable specimens that, due to restrictions on the museum appropriations, could not ordinarily be purchased.

The change from working days of nine or ten hours, to which I had been accustomed, to government hours (then 9 to 4) was most acceptable; it is always easier and pleasanter to decrease instead of increase one's hours of work. But I have never regretted those long days at Ward's and doubt if, under different conditions, my time would have been more profitably employed than it was.

At first it seemed as if the time might hang heavily on my hands in spite of various things that I wished to do for myself, but soon opportunities offered for making drawings for scientific papers and later on in writing for cyclopedias, a line of work that culminated in taking part in the revision of the Century Dictionary. Washington was, and for that matter still is, an admirable place for such work, as its museums, libraries, and scientific bureaus provide a combination of men and material not to be found elsewhere, another important point being that the institutions are readily accessible and within reach of one another.

Some frivolous person is said to have remarked that he had a great respect for encyclopædias and dictionaries until he came to Washington and met the men who wrote them, but be that as it may, Washington furnished many of the editors of, or writers for, the Century, Standard and Webster's Dictionaries, Johnson's Cyclopædia, and the last edition but one of the Britannica.

At Washington, in connection with my work, I gradually made the acquaintance of men like Coues, Dall, Gill, Howard, Ridgway and Riley, men whose names are so intimately connected with the progress of zoology in America. Later came the younger men, now, alas! no longer young, though happily mostly still here: Merriam and those he gathered round him; Fisher, Howell, Oberholser, Osgood, Palmer and Richmond. To associate with such men was a liberal education in itself, and no book learning, no training in the laboratory, can begin to compare with the knowledge thus gained.

To this might be added Alexander Graham Bell's pleasant and profitable Wednesday evenings, for they not only gave the younger men

an opportunity of meeting their seniors unofficially and of hearing at first hand a discussion of some of the important scientific problems of the day, but an invitation to these evenings was a recognition of the fact that they too were counted among the scientific workers. The one qualification for attendance was that the visitor should be able to tell something of interest, and no one ever possessed greater ability to "draw people out" and make them talk than did Doctor Bell.

The liberal policy adopted by Baird for the Smithsonian and the U. S. National Museum was reflected by those associated with these and the kindred institutions, the U. S. Geological Survey, U. S. Department of Agriculture and the U. S. Fish Commission—now Bureau of Fisheries—and there was no place where information was more freely given than in Washington and no class of men who gave it more cheerfully. In those days, these institutions were not the great bureaus they subsequently became; everybody was acquainted, money or position did not count for so much as now and a young man was accepted largely on his own merits.

While my first scientific work was done and my first papers¹ published while in Rochester, yet it may be said to have really been taken up seriously in Washington where I had more leisure, more opportunity, and more advice and criticism.

My scientific work was taken up on my own initiative, since, Doctor Goode once told me, "the preparation of scientific papers was no part of my duties." However, he never prohibited such diversions so long as they did not interfere with my other duties, which never happened, partly because of a liking for mechanical work, partly because of the pleasure of seeing exhibits grow under my hands, and partly because of another remark of Doctor Goode's that ———, engaged as Assistant Curator, was "getting off in a corner with his microscope and not arranging the exhibits in his charge."

Not unnaturally, I took up the osteology of birds, as material was more readily obtainable than in any other class of vertebrates—material, too, more varied in its character and that from its small size could be easily and quickly prepared. Also Shufeldt's papers, the first of which had recently appeared in the Bulletin of the U. S. G. S., had suggested work on birds, and I suspect that the fact that these, with their numerous illustrations, were attractive-looking papers had considerable influence on my choice of a subject.

My skill as a preparator stood me in good stead here, for I was not dependent on anyone for the preparation of specimens, and when I

¹On the Species of Orangs, and *Oe prominens*.

learned that there were such things as vomers and maxillo-palatines, I was able to give special attention to these fragile bones that are too often destroyed, or seriously damaged, by the average preparator.

And right here, I should like to emphasize the importance of manual work, the desirability of using one's hands as well as one's head, a point that is not often considered by the present generation, which lays an undue stress upon mere education, forgetting that information is not intelligence and that books cannot take the place of experience. All through my career, mechanical ability has stood me in good stead: if I had not been able to prepare and mount skeletons, I should not have gone to the U. S. National Museum where I obtained my scientific training, largely by actual work in my own time.

It was also a decided advantage to be able to make my own drawings, for, as all who have dealt with small, unfamiliar objects know, it is often difficult to get them correctly rendered, quite aside from the fact that institutions do not always feel like paying for them. And while I regret to say that my figures mostly belonged in the category of "cuts rightly called wooden," yet they had the merit of accuracy of detail. Photo-engraving was just coming into use and this too was helpful since it did away with one item of cost.

My first promotion came in 1887 when I was appointed Assistant Curator, Division of Comparative Anatomy. Subsequently I became:

Curator, Department of Comparative Anatomy, 1893
Acting Curator, Section of Vertebrate Fossils, 1901
In Charge of Exhibits, Department of Biology, 1902
In Charge of Children's Room, 1902

these four positions, as well as that of Chairman of the Committee on Furniture and Fixtures, being held at one time. Right here it may be noted that this multiplicity of positions brought no corresponding additions in the way of salary, which at the maximum was that of a Curator. It did bring additional experience and opportunities for work in new lines, though at the expense of any research in which I was interested. Among other things it practically put an end to work begun on a Memoir on the Stegosaurus, which was later taken up and admirably carried out by Mr. Gilmore.

Through sheer force of circumstances, I was diverted from the study of birds to that of fossil vertebrates, an important factor being the unfortunate quarrel between Professor Marsh and Professor Cope which ended in the appointment of the former as Palaeontologist of the U. S. Geological Survey. Professor Marsh was a born collector but he was

not a hard worker, and while supposedly one of his duties was the identification of material brought in by field geologists to aid in the determination of horizons, he very seldom did this. So, there being no vertebrate palaeontologists on the Museum Staff, I was called upon to identify such specimens and later to look after the first large shipment sent by Professor Marsh to Washington, and finally, upon the death of Professor Marsh, to take charge of the packing and shipping of government collections in his charge. This work took six months and was finally carried out by my colleague, Mr. J. W. Scolliek, also a graduate of Ward's.

All in all I had twenty-two years of varied experience in the United States National Museum, my duties ranging from the mechanical work of cleaning and mounting skeletons to that of administering a division in each of two distinct departments, Comparative Anatomy being in Biology, and Fossil Vertebrates under Geology.

I have said nothing about field work, for little or none fell to my share,¹ the nearest approach to it being the expedition to Funk Island in 1887 to secure remains of the great auk, an undertaking which was eminently successful, enough material being obtained to reconstruct half-a-dozen fairly complete skeletons from the thousands of bones collected.² This, however, was but one, though the principal one, of the objects of the expedition which was to have included a study of the mackerel in the Gulf of St. Lawrence, a study which did not take place, for in 1887 the fickle mackerel did not appear in the Gulf at all. As a whole the voyage was as pleasant a summer trip as could be imagined. Long hours and hard work meant nothing then, the company was most congenial, and in between the days of collecting there were now and then idle times when we were fog-bound or storm-bound in the vicinity of some trout brook which afforded good sport and subsequently a fine breakfast. Barbour, the cook of the "Grampus," was not only a good cook but most accommodating; if we wished to start off at 6 A.M., there were hot coffee and hard bread; did we arrive at 9 P.M., tired and wet, there was a warm supper awaiting us.

But it was not all skittles and beer, as the inexperienced are apt to think; getting material is good fun, but taking care of it is a different thing. Taking forty or fifty gannets, murres and puffins, to say nothing of eggs and young, at the Bird Rocks was interesting, but sitting up

¹In fact, there was little field work in those days, and to Dr. C. Hart Merriam belongs the credit—or most of it—for the organization of systematic collecting and the formation of large study series.

²Described in "The Home of the Great Auk." *Pop. Sci. Monthly*, Vol. XXXIII, No. 28, pp. 456-464, Aug., 1888.

night after night skinning greasy sea fowl and then trying to get the skins dry was quite another matter.

Field photography was in its infancy, in the stage when it was not so difficult to photograph a bird in the open as it was to find the bird in the photograph. As late as 1890, Mr. Dutcher, at a meeting of the American Ornithologists' Union, pointed with pride to a photograph of a gull, stating that it was his one success in 150 negatives.

While there was much field work in connection with the Fur Seal Commission of 1896 and 1897, yet the members of the party were comfortably housed in the villages of St. Paul and St. George.

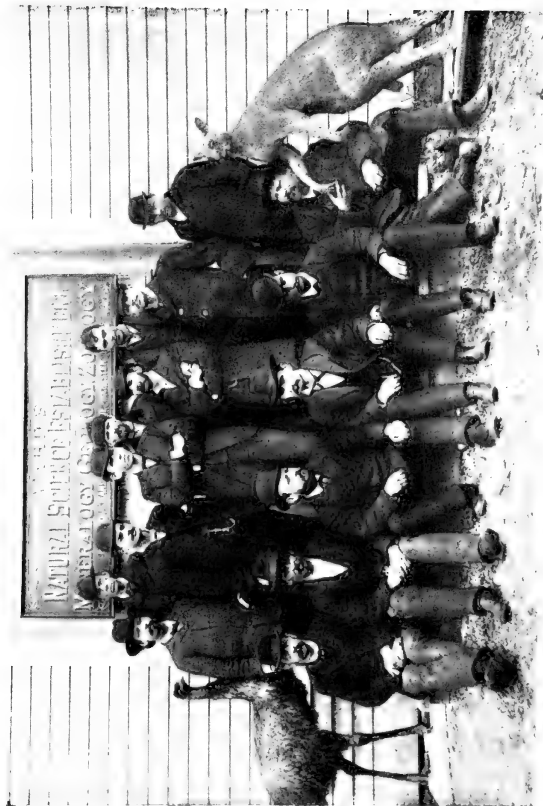
In passing it may be said that the conclusions reached by that Commission have been fully borne out by the observations of others and especially by the results of the cessation of pelagic sealing.

My one great desire to charter a schooner and cruise through the Pacific Islands on a collecting trip was never realized, and only today, half a century later, is such work being carried on. There were few millionaires in my earlier days and still fewer patrons of scientific work.

My last work for the U. S. National Museum was in 1903-04 in connection with the Louisiana Purchase Exposition, when I was despatched to Newfoundland to secure the cast and skeleton of a fully grown blue or sulphur-bottom whale, a commission that with the aid of my associates, Messrs. William Palmer and J. W. Scollick, was successfully executed.

This work involved a stay of nearly two months at the whaling station at Balena on the south coast of Newfoundland and afforded an excellent opportunity to obtain information in regard to three species of whales. Incidentally it led later to the making of the fine model in the American Museum of Natural History which was based on the measurements and information then obtained.

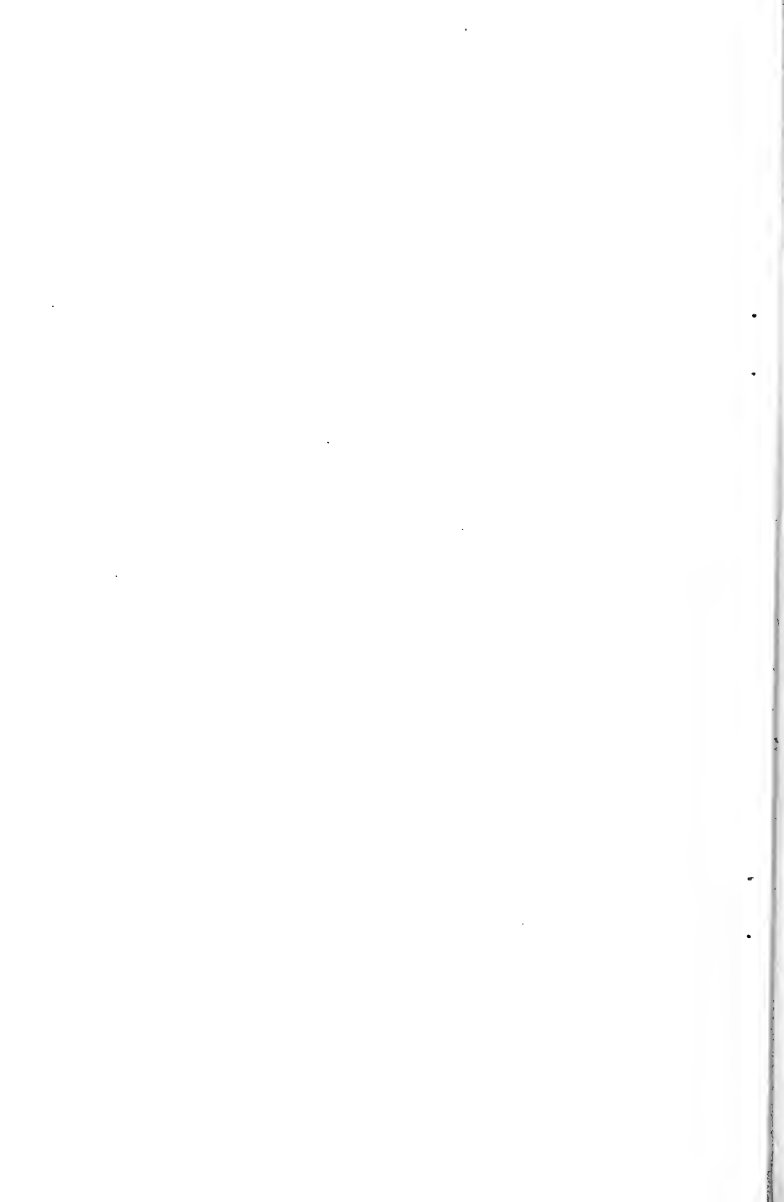
The worst part of this work was the fear of failure, the worry lest we did not get a good big whale, and there were some anxious days when no sulphur-bottoms were taken or even seen. We had been assured that whales eighty or more feet long were caught at Balena and when we measured whale after whale and nothing over seventy-five feet turned up, and few of that length even, there was cause for anxiety. As we found later, the length of the large whales had been *estimated* by standing on one side of the "slip" and noting the distance on a fence the other side of the whale, the attendant parallax giving the whale several additional feet in length.



COLLEAGUES AT WARD'S NATURAL SCIENCE ESTABLISHMENT

Standing: left to right: Frederick S. Webster; Harry L. Preston; Edmond N. Gueret; Arthur B. Baker; Robert Kochler; Frederic A. Lucas; J. William Critchley; Frederick W. Staehmer; E. Mirquet

Seated: left to right: Nelson R. Wood; "Chris" (Isidore Prevotet?); Chas. E. de Kaempener; William T. Hornaday; John Martens?; Jules F. D. Bailly



However, the necessary mold and skeleton were obtained and are today in the U. S. National Museum, having been, as planned, displayed at St. Louis.

The day after the skeleton of the big Blue Whale was put in place, I left for Washington and began "putting my house in order" preparatory to leaving Washington and entering upon the third stage of my career.

1904-1929

This third period of museum work began in May, 1904, when I was called to Brooklyn as Curator-in-Chief of the Museums of the Brooklyn Institute of Arts and Sciences, a somewhat cumbersome title since changed to Curator-in-Chief of the Brooklyn Museum.

This offered an opportunity to put into practice the results of past training and experience, though this opportunity was by no means what one not acquainted with museums might suppose or expect. For while the Museum was young, it was not new; it had a fairly well determined policy and definitely established departments in charge of their duly appointed curators. In any such institution the director is more or less hampered by the policies and exhibits that he inherits; by policies in which he does not believe, by exhibits—often costly—that he feels to be mistakes, by departments that he thinks should never have been established, and by employees—from curators to attendants—that he considers sometimes to be inefficient, and more often unsympathetic or interested only in their own work. But he has inherited all these, they have cost much time and thought, and in many cases very considerable sums of money, and unless the director is regardless of time, money, and above all, the feelings of others, he will do his best with them.

At Brooklyn, for example, the Department of Anthropology was well established and in the hands of Mr. Stewart Culin, a thorough student in many lines of ethnologic work and of extremely artistic taste. The exhibits installed by him in the Brooklyn Museum are not only accurate and educational in their presentation of facts but perhaps the most attractively installed of any ethnologic exhibits, here or elsewhere. My own liking would have been for a series of exhibits that should give the public some idea of the physical characters, occupations and customs of the inhabitants of various sections of the world. Mr. Culin's plan was to concentrate on certain phases of culture with which he was acquainted or in which he was particularly interested, commencing with those that lay near at hand which would give immediate results in the

way of exhibits. The result has been a full and beautiful presentation of certain widely separated sections of the world that appealed to the curator.

The ideal exhibit of anthropology is yet to be made, and while the American Museum of Natural History is making headway towards it, yet owing to work already done and material accumulated, it is doubtful if it will ever be possible to make an evenly balanced presentation of the races of the world. Here is a fine opportunity for some anthropological museum of the future—though it must be a future fairly near or the chance will be gone forever.

The existence of the Brooklyn Museum was due to the energy of Professor Franklin W. Hooper, and it was originally organized on the theory that the various departments of the Institute (Brooklyn Institute of Arts and Sciences) would have charge of the corresponding departments of the Museum, the officers of these departments acting as curators. It is needless to say that this theory did not work in practice although it did serve as a beginning. Unsalariated curators, no matter how enthusiastic, can rarely afford the time necessary for the care of the collections—or if they can afford it do not take it, the result in either case being that the collections are neglected.

The recognition of these facts by the trustees, as well as the fact that a museum can not be efficiently administered by a hasty visit once a week, led to the appointment of Doctor A. B. Mayer (later changed to Mayor) as Curator-in-Chief, and by him the Museum was re-organized and placed on a sound working basis. It was shortly after this that I was called to the Museum, my advent being due to the resignation of Doctor Mayer to take charge of the Marine Biological Station of the Carnegie Institution at the Tortugas.

The Departments of Fine Arts and Anthropology were efficiently administered by Professor Goodyear and Mr. Culin, the real problem being the Department of Natural History which was the product of the efforts of several departments of the Institute. It was possible to recognize the period and duration of the activities of each by the condition of the collections. The departments of geography, botany, mineralogy, zoology had successively been active in installing their collections, which later, owing to lack of funds and interest, fell into neglect. The result was something like an ancient village site, in strata of disorder, the exhibits of the most recently active department being at the front and the others pushed to the back or relegated to the top shelves.

Fortunately, my associates, Messrs. Cherie, Schaeffer and Doll, were active and interested, and although it was a year before I invited

my friends to see the Museum, by that time we had made appreciable progress and chaos was giving way to mere confusion.

And when seven years later I was called to New York, I left behind a small but evenly balanced exhibit of the classes of vertebrates, a fine beginning of a similar display of invertebrates, some groups such as the guacharo birds, orioles and others as yet unsurpassed, and unique exhibits illustrating evolution and the preservation of animals, among them the first illustrations of Thayer's counter-shading and concealing coloration shown in any museum in the United States.

Perhaps my most keen regret was the failure to develop a botanical exhibit along the lines of those carried out for zoology. The subject had frequently been discussed by Mr. Morris and myself and one of the objects in view in securing the services of Mr. Morris, he being an excellent botanist, was to develop that side of the museum. One of the features of the Botanical Exhibit was to have been a series of groups showing interesting plants, or features of plant life, something that has not yet been done. The first of these groups—adaptations of plants to desert life—was planned by Mr. Morris, the studies made, material collected and the group begun. After the death of Mr. Morris the plan for a botanical exhibit was abandoned and a number of antelopes were introduced into the Adaptations of Plants to a Desert Life.

The Trustees failed to grasp the fact that the establishment of the Brooklyn Botanic Garden did not lessen the desirability of a botanical exhibit in the Museum, and that the work and exhibits of the two did not conflict, that each institution could do something that it was not in the power of the other to carry out.

The next step, as I have said, was from Brooklyn to New York, to the Directorship of the American Museum of Natural History in 1911, and, naturally, this part of the story of my museum career must, if written at all, be written later and by some one else, some one who I trust can judge impartially and write unprejudicedly—though I hope sympathetically of what has or has not been accomplished.

It may appear surprising that it was not without great hesitation that I left the Brooklyn Museum, but in doing so the opportunity to build up an educational museum that should, so far as Natural History was concerned, reflect my own views and be an evenly balanced exposition of plant and animal life was lost forever¹—and such a museum does not, so far as I am aware, exist either here or abroad. For Museums,

¹And yet—this may be entirely wrong—the death of my colleague, Mr. E. L. Morris, and that of Colonel Woodward and other sympathetic trustees, together with the arrest of building operations, completely changed the course of events.

so far as their collections are concerned, are seldom, or never, formed according to a definite plan. Their growth is sometimes influenced by circumstances, a bequest, the gift of a collection, or of money for the purchase of a collection. More often it reflects the interest of some man, or men, in particular branches of science or art. These men may be able or energetic curators of great persuasive powers, wealthy friends of the museum, or even collectors who have the gift of persuading such men to buy their collections or to undertake certain expeditions. The result is that museums are more or less unbalanced, overdeveloped in some directions, atrophied in others.

Such, briefly, is the record of fifty years, during which time it has fallen to me to hold a variety of positions in the two most important museums in the country. It has not been a career of unalloyed pleasure and the pleasure has been in an inverse ratio to the importance of the position occupied. The higher and more responsible the office, the more is the time of the administrative officer taken up with details, the less can he do as an individual, the less can he show as the result of his expenditure of time and energy. In my own case the greatest tangible results were produced when I was preparator and assistant curator, for it was then that I organized and largely prepared the exhibit of the Department of Comparative Anatomy in the U. S. National Museum, and the small Synoptic Series of Invertebrates.

The larger the museum, the longer it has been in existence, the more difficult it is for one man, and especially for the director, to make an impression on it; the director is submerged in the institution. The best he can do is to stimulate some undeveloped or desirable branch of work and to restrain so far as possible overgrowth in others, or prevent the commitment of an institution to long and expensive undertakings, to wait for opportunities that may never come.

A very large portion of my time since becoming director has been spent in salvage work; in trying to do something with exhibits that had been begun by some one and then dropped, either through cessation of interest, or through a desire to develop some new idea, or branch of work. Many of these abandoned projects were well worthy of being carried out, for change is not necessarily progress, though many a young curator seems to think it is. But while it has often been interesting to see what could be done with rejected material or the abandoned plans of others, yet after fifteen years of such work it becomes a little tiresome.

I do not wish to appear egotistical but I presume I have had more disappointments than any other museum man, more unrealized ideas if

not more unfulfilled plans;¹ one can have a great many disappointments in fifty years. I cannot say more unfulfilled plans because early in my career I learned the futility of making plans and the only two I ever made came to naught. "Blessed is he who expecteth nothing for he shall not be disappointed."

The things I did accomplish were simply kept in mind and carried out as opportunity offered and opportunity without a plan is vastly more important than a plan without opportunity.

Also, as previously intimated, the director of a large museum is frequently, or largely, director in name only; he is often actually the executive officer, the real power of initiative and accomplishment lying with the curators or trustees. Nevertheless, the director, like Providence, is often held responsible for many things for which he is really quite blameless. A director can accomplish little without the support of the staff; it is not necessary that there should be direct opposition; mere lack of support, want of sympathy, failure to act on his suggestions are enough, if the director be at all sensitive, to bring to naught his most cherished ambitions or well-laid plans. The director who desires to lead a peaceful life must be prepared to take disappointments philosophically, to see his own plans come to naught while helping others to the fruition of theirs, must expect to be criticized on the one hand for what he does and on the other for what he does not do. He would best adopt for his motto the advice of Æneas: "Remember in arduous affairs to preserve an equable mind." Whether or not he can follow it is a different matter.

In museum work the greatest satisfaction is usually to be had not in looking forward, still less in looking at present conditions, but in looking backward. The future is usually obscured by the haze of uncertainty and there are many times when the star of hope shines but dimly. As for the present, there are so many things one wishes to do, so few that one *can* do, that there are times when our own particular museum or department seems to be standing still while others are moving onward.

And there are periods of discouragement, many times when one wonders "if it all pays," if the gain to the public and to education warrants all the time, thought and money put into museum exhibits. This is a question that may be answered by the public in two ways, by attendance and by appropriations and gifts for the support of a museum. The

¹It may appear surprising, but in my fifteen or more years of directorship it has never been my fortune to install even one habitat group just as I should like—and yet our critics, ignorant of the handicaps under which we labor, tell us what we ought to have done.

man of wealth can give cash, the man without money his presence, and both are helpful and keenly appreciated.

That I did not start out with a definite idea of following a "museum career," of passing my life in a museum or in museum work is hardly to be wondered at. For one thing, there were very few museums in my younger days and little reason why one should think of a "museum career" for the occupation of a lifetime. Fifty years ago the number of museums in this country could almost have been counted on the fingers of one hand and they were all attached to some scientific society, but the idea of a popular museum, a museum for the people, was held by few. Within the last half century, the greater number of museums in the United States have come into existence and the general policy of museums changed. From being largely storehouses of material for the use of a few men of science, they have become great institutions for the education and "rational amusement" of the public at large; the exhibition of specimens, instead of being, so to speak, a side branch of museum work, has become one of the most important functions of a museum; in some cases even, exhibition is the main function or object, research and publication being secondary considerations, and in the larger museums, the greater part of the space is devoted to the exhibition of specimens for the benefit of the public. Such great edifices as those that house the collections of the U. S. National Museum, the American Museum of Natural History and the Field Museum would not be needed were it not for the carrying out of their work for the benefit of the public.

Today the opportunities for a museum career are better than ever and the inducements for a young man to enter upon museum work as a profession, correspondingly attractive. Therefore, I frequently tell applicants for positions, or young men about to enter upon their life's work, that the pecuniary rewards, with few exceptions, are not great but usually one has the pleasure of interesting work and congenial associates.

UNPUBLISHED PAPERS AND ADDRESSES
A NATURALIST'S VIEW OF MUSEUMS OF ART¹

At the first meeting of the American Association of Museums it was my pleasure to listen to a paper by Dr. Gilman on "The Aims and Principles of the Construction and Management of Museums of Fine Art." More recently it was equally my pleasure to see the same article in print, and while heartily in accord with the greater part of the principles enunciated, there were places where—I will not say I disagreed with Dr. Gilman—I looked at the proposition from a different point of view. When an invitation was extended to me to be present today, Dr. Gilman most courteously suggested that I might find a text for a paper in his article and I have availed myself of this suggestion to present A NATURALIST'S VIEW OF THE AIMS OF A MUSEUM OF ART. The underlying principles of museums, be they Museums of Science or of Art, are alike; they are collections of natural objects, or of those made by man, placed where they may be preserved, seen, and studied. The objects, or specimens, may be displayed for general purposes only, or for the illustration of some subject or the elucidation of some idea.

Museums have undergone great changes during the past twenty-five years and the general tendency now-a-days is to illustrate, by the display of objects, their arrangement and their accompanying labels, some fact in nature or in the history of mankind; and to illustrate it in such manner that it may be readily comprehended by visitors.

Now the question has arisen in my mind as to whether the administrators of Museums of Art do not take too much the view of the artist and too little the view of the average visitor. Is the *sole* purpose of the exhibits of a museum of art to foster a love of the beautiful and promote an appreciation of the principles of art? Are there not other things that an art museum can do, should do, for its visitors? As a general statement of what a naturalist thinks a museum of art *might* do, let me quote from a paper of mine on the place of museums in supplemental education, presented at a meeting of a library club.

Museums of art, in a way, are the oldest of museums and yet to me they seem to make the least use of their opportunities; partly, possibly on account of the cost of their collections, partly on account of their growth by generous gifts, but largely on account of the point of view of their administrators. The view very generally adopted seems to be that the function of an art museum is merely or largely to display beautiful objects and foster a love for the beautiful. The history of art, the effect of environment on the artist, the influence of political, religious or economic condi-

¹Read at the opening of the Museum of Fine Arts, Boston, Mass., November 9, 1909.

tions upon art and artists, are subjects well capable of illustration, and there are many simple and reasonable questions often asked by the intelligent visitor that might well be answered by the exhibits. The visitor for instance has read much of some particular school, let us say the Barbizon school, and he would like to see a dozen pictures illustrating the work of members of that school accompanied by a label a half-page long telling him what to look for. Here is where the art museum might well take a place in supplemental education and where, so far as I know, it fails to do so.

The Museum of Natural History has its index or synoptic series, presenting a sketch of the Animal Kingdom from the simplest to the highest forms, from which the visitor may gain some idea of the great branches of the animal kingdom, their common origin, development, and relation to one another. Should not the Museum of Art do something of the same kind and give the visitor some idea of the origin, progress and ramifications of art? Such a collection need not necessarily be a large one, but, to my mind, it would be mightily instructive. Years ago I saw such a collection in the technical museum of Dresden, and to this day that collection impresses me more than any other art collection I saw in Europe, for it exemplified the progress of mankind. It did not show me a lot of battered statues that the guide-book told me were beautiful, it did not display a series of paintings, marked masterpieces whose hues had been dimmed by age and outlines half obliterated by the iconoclastic hand of time, but, as I passed from room to room I could see for myself how, starting with the simplest materials and subjects, art had progressed from age to age, ever advancing, ever changing, ever embodying and reflecting not only man's ideas of what constitutes beauty—for beauty is only a relative term—but man's growing ability to translate those ideas into form and color.

From the viewpoint of the Naturalist there is one great lack in Museums of Art—and that is labels. And it is rather interesting to note that Dr. Gilman does not include them in his statement of how the museums may be of service to visitors. Now to my mind there is absolutely nothing that can make up for the lack of labels, neither bulletins, catalogues, handbooks nor libraries.

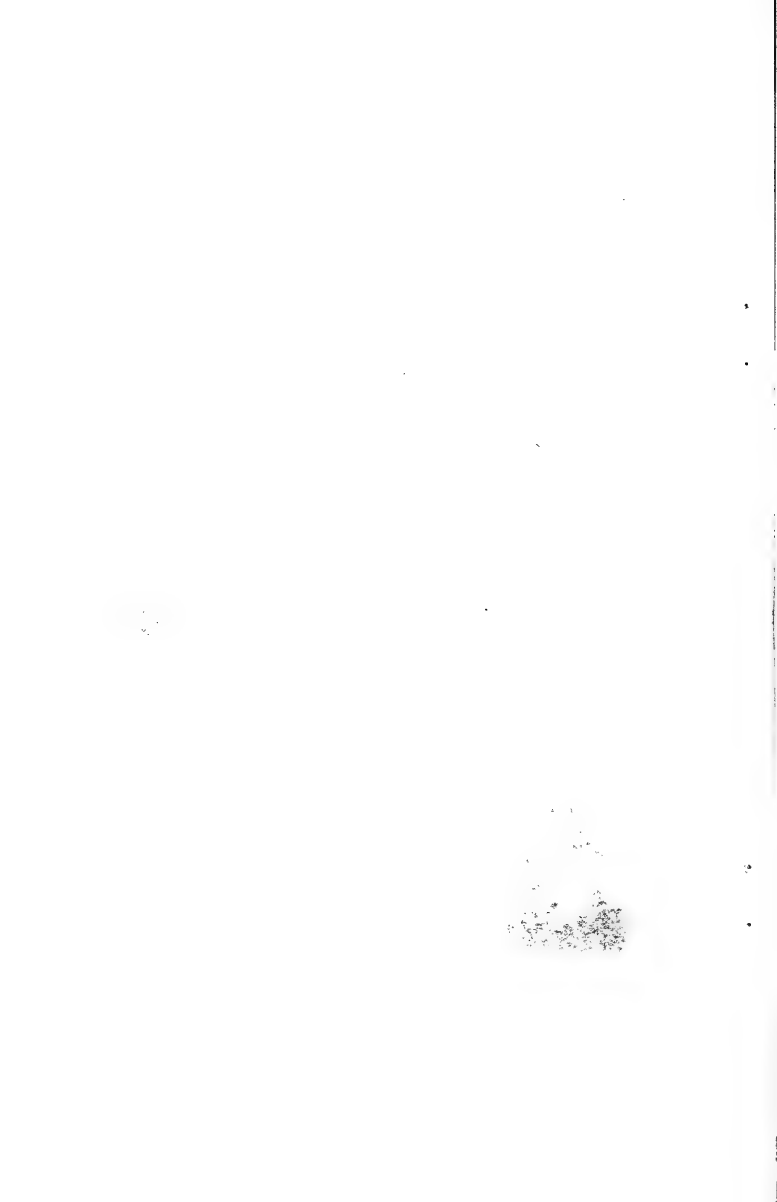
A year or two ago there was a popular song whose refrain was "I want what I want when I want it." This is precisely the attitude of the visitor—when he desires information he wants it at once; he doesn't wish to go home or to the library, or even to a reading table or a catalogue to find out about the object. This is the opportunity for the museum to impart information, and this opportunity should not be missed.

Some of you, like myself, may have had the pleasure of seeing Willard in "The Middleman," and can recall the scene wherein the little party calls



BERING SEA COMMISSION OF 1896-1897: ON BOARD U.S.S. ALBATROSS

Front row, left to right: Lieut. Commander Jeff. F. Moser, U.S.N., Commanding U.S.S. Albatross;
Dr. David Starr Jordan, Chairman; Professor D'Arcy W. Thompson (British Member); Dr. Leonard Stejneger
Rear row: James M. Macoun (British Member); Dr. Charles H. Townsend; Dr. Frederic A. Lucas;
George A. Clark, Secretary



upon Cyrus Blenkarn. The potter, anxious to be at work and desirous of getting rid of his untimely visitors, reaches for a piece of porcelain, holds it out and says, "Teapot, Royal Worcester, 1760." Can not the Museum of Art do better than the bored potter? For it should ever be borne in mind that the *average* visitor does not go to a museum for instruction; he goes to be interested, pleased, in search of what John Edward Gray called rational amusement. The student may be trusted to find the information he is in search of, or at least to find where it may be had. The problem of the museum—so far as its exhibits are concerned—is to add to the number of students, to stimulate the interest and arouse a desire for more knowledge in the mind of the chance visitor.

Having our collections, how shall they be housed? As a general principle a museum building and its halls should be simple in design, but as all things go by comparison so this simplicity should not degenerate into ugliness, as it may all too readily do. It is quite as easy to be plain and ugly as it is to be ornate and ugly. There are various kinds of plainness; Louis Agassiz's idea is embodied in the Museum of Comparative Zoology—a cheap and ugly husk for its kernels of scientific gold; and probably Dr. Gilman's definition would be found in the dignified simplicity of Doric architecture employed in this building. The exterior of a building should in itself attract attention and be worthy of study, while at the same time implying that "there's that within that passeth show." The masterpieces of literature are none the less masterpieces though bound in plain boards, but lovers of books do not so bind them, striving rather to preserve harmony between cover and contents. A jewel is worthy of its setting of gold, and the exterior of a great building should be in keeping with its contents and suggest to the passer-by the treasures of art or science displayed within. It should not be possible to mistake a Museum of Art, or of any kind for that matter, for a factory, a business block, or even a municipal building. A museum building should be a liberal education in itself, ever speaking in no uncertain tones to the community in which it stands.

In regard to the decoration of halls we shall all agree that there should be few mouldings and practically *no* decoration in the unoccupied hall, since it can rarely be seen what the hall will ultimately be used for. But in the completed hall appropriate decoration, or exhibits used for decoration, will surely add to the harmony and artistic effect, as well as to the educational value of the objects shown.

As a case in point let me cite the Hall of Armor in the Metropolitan Museum where the objects shown are comparatively small. When the

hall was installed it was at once recognized that it was bare and unfinished, a defect that was remedied by hanging the walls with large tapestries that added to, instead of detracting from, the general effect. It seems to me that it is not a question of no decoration, but rather of appropriate decoration.

As to the proposition that galleries should not be thoroughfares, it may be said that few, if any, institutions have the necessary room to carry this principle into effect, and even if corridors were provided, they would not be allowed to stand empty and idle, but would surely be used for exhibits of some kind. For it should be the aim of a museum to utilize all its space to the best advantage, to teach something at every step and turn, to have no blank pages in its book. For example, the primary purpose of a doorway is to let people in and out of a building, and yet again and again has the artist availed himself of his opportunity to utilize a space where every one must pass. The very fact that museum halls are used, as a general rule, for corridors, offers an opportunity that the museum may well embrace. I would reverse the plan of having corridors apart from the main exhibition halls and let the halls serve as corridors. Opening from them, I would have rooms for special collections of small objects or for the display of a few objects of particular importance,—a single statue or one or two paintings that should be seen by themselves to be appreciated.

In the main galleries the visitor gets his general impressions; in the others he learns to appreciate the particular beauties of some masterpiece, and this he does under conditions of isolation, quiet and rest, repose of body being added to peace of mind.

There is another point to be considered: I fully agree with Dr. Boas that the vast majority of museum visitors do not come as students with a definite purpose in view, but to be amused or interested. To a great extent, speaking of material on exhibition, the student is a negligible quantity; the real problem is to catch the eye and arouse the interest of the passer-by—the “man in the street” from whom ultimately the support of our museums must come. Hence a museum should be so arranged that he who runs may read, that the casual passer-by may be attracted by some exhibit and thus gather some piece of information that he was not looking for.

None the less, in seeking to gratify the eye, we should not forget that there is something beyond this. The friends of Art will hardly claim that it is her mission to gratify the eye alone; in these days we expect a little more of our goddesses than simply to look pretty. In our

great museums of science it is no longer deemed sufficient to present the truths of science in a bald, unattractive manner; it no longer suffices for the exhibits to be instructive only, they must be attractive as well. It was all right for truth to be naked so long as she dwelt at the bottom of a well, but when she was haled forth and placed upon a pedestal to be gazed at, drapery became necessary. Art and Science, though usually depicted as sisters, have, as sisters often do, dwelt apart from one another in our museums until recently. But with the continued evolution of museums, Science has called Art to her aid, in order to clothe her facts in attractive form, and possibly the elder sister Art may now profitably use a few pages from the book of Science.

MUSEUMS AND LIBRARIES¹

The functions of museums and libraries are essentially different so far as the public is concerned; the one endeavors to interest through its exhibits, and its work, with the vast majority of its visitors, must be done mainly by what they see rather than by what they read. A museum is a book in which the pictures are more important than the text. Some of our artistic friends, in fact, go so far as to say that in their case no text is necessary, though few there be who will subscribe to this. In a library the text is everything, the pictures incidental. The museum, that is, the exhibition portion of it, is for the man who is not looking for information but for amusement; the library is for him who is deliberately seeking after knowledge.

So great is the difference between a museum and a library that my friend Mr. Ward has written a very able paper to show that the two can not be successfully combined and administered, and I confess that, so far as large institutions are concerned, I fully agree with him, even though a library be a most essential part of a museum. And yet there are many and important relations between the two. In a way, indeed, the museum has a double relation to the public library, or to its own. The reader learns of certain natural facts, remarkable animals or of pictures, statuary and other objects of art, of the rituals, or the ceremonies of certain savage tribes and seeks the museum for an illustration of these facts, or a sight of the things he reads about. Conversely the museum visitor has his interest aroused by the objects he sees, and hies himself to the library in search of further information.

I am bound to confess that this is partly a matter of theory, but we know this relation does exist and if more readers do not seek the museum,

¹Read at the Brooklyn Meeting of the American Library Association, September 29, 1911.

or more visitors the library, it is largely because the public has not been accustomed to so doing.

The museum supplements the library by showing to the reader the objects of which he has read and by suggesting other lines of work. It supplements the school by displaying in concrete form the facts that the scholar has been taught; it supplements the college by providing the student with material for both present and future research.

But the museum does very much more than merely supplement education, for by the very fact just pointed out—that it depends upon its exhibition series for its influence on the public—it is able to reach a large constituency that has little or no book learning and never seeks the library.

Now, though this is pure theory, I would make an exception to the rule that a museum and a library can not be successfully combined, in the case of our smaller towns where funds could not possibly be secured for the support of a library and a museum and where, I believe, in spite of the proverbial difficulty of housing two families under one roof, the library and the museum could exist together to their mutual advantage and prosperity.

We have a hint of this in the small loan collections that the American Museum has been placing in some of the New York libraries, and while these have been, so to speak, largely in the nature of advertisements, the intent being to draw attention to the Museum, yet the interest they have attracted shows how the scheme is capable of expansion.

I do not forget that in our neighboring city of Newark the Museum is the offspring of the Library, but while we will agree with Mrs. Malaprop that "comparisons are odorous," yet I think we will equally agree that few librarians have the museum sense of Mr. Dana. Moreover, we all feel sure that sooner or later the Museum will outgrow its present quarters and become a sister institution. I will leave it to some one else to explain how outside the pages of a problem novel, it is possible for a child to become its mother's sister.

Now, going back to the problem of the small town, it is easy to see how the association of library and museum would simplify such important questions as the housing and care of collections, including heating, cleaning and other essential matters. I believe that in many cases the museum would thrive better in the care of a librarian than at the hands of the High School principal or professor in a small college. At all events, the experiment is well worth trying, and it may be said that the most forlorn-looking and neglected museums are those to be found in

many of our smaller colleges. There are many good reasons for this neglect aside from the all-important one of the lack of the museum sense. The teacher has work that must be done, and his interest in the collection is necessarily a secondary matter. And then schools and colleges are closed at least one-fifth of the year and have neither the means nor the inclination to care for their little museums during this time, while the library is ever open.

The union of museum and library would afford good scope for the utilization of two important factors in founding and starting a museum, the private collector and loan collections. And while no one is more consistently opposed than myself to the acceptance of loans by a large museum, no one more fully recognizes their value and importance in the beginning of things. It is the collector who usually fails to realize the limitations of loans, and feels hurt when his collection is declined. These collections may be looked upon as the scaffolding and false work for the erection of some great bridge or other piece of engineering. They are all essential at the outset—the work could not be done without them, and yet when the structure has been completed, the elaborate and costly things are stripped away.

And equally as I am opposed to mixed museums on a large scale, to gatherings of heterogeneous material that, like a tangle of ropes, presents a dozen loose ends that lack continuity and end in a snarl, I am in favor of mixed collections on a small scale, because they present so many points of interest.

The best museum man is not he who does nothing because the material is not available to fit into some carefully thought-out plan, but he who can take whatever may be at hand and weave it into some instructive if not thoroughly harmonious whole.

In every small town there are things of interest, things which are much more valuable when combined than when seen as isolated, individual units. A cup and saucer here, a plate there, when brought together make an instructive and interesting display, none the less valuable because they are few in number. For the motto of the modern, up-to-date museum is *non multa sed multum*, not a vast assemblage of things but a selected assemblage well displayed and carefully labeled, and so the small collection in a small town is proportionately just as effective as the large museum in a great city.

It is not so much the material as the manner in which it is handled, and I know of at least one provincial museum full of interesting things that presents the air of an old-time attic on a large scale. The specimens are there—the possibilities great, but the curator is lacking.

I trust you will excuse me if this paper goes a little haltingly, and if I have used in it some things that I may have said before.

The less one does, the less one wishes to do, and when I go away on a vacation, I am only too glad, for the time being, to leave all thought of museums and their work behind.

THE POVERTY OF THE LARGE MUSEUM

Our friends in the smaller museums are often surprised that large institutions do not respond more quickly or more frequently to some of the calls made upon them: knowing how much a small museum may and does accomplish with very limited means, they feel that to the great institution *all* things should be possible.

Why, for example, can not a promised gift or exchange of bird skins be made promptly?

There are known to be perhaps 200,000 skins in the collection and surely some are available. But—the curator is engaged in the preliminary study of 1,000 skins just received, and the assistants are engaged in cataloging and arranging still other thousands. The skins presumably available for exchange may comprise series not merely from one locality casting light on problems of individual variation, but they may prove to cover a wide range of territory and be valuable for the study of geographic variation—in either case none can be spared, at least for the time being.

The case is often like that of the man well on the road to intoxication,—one may have too much but not enough. This recalls Mrs. Witmer Stone's definition of "a series": "one more specimen than any one has."

Take again the matter of casts or reproductions. It seems strange to a curator of a small museum that the great sister institution can not immediately send him a cast he needs very badly. But—the moulder in the large museum is wanted for work in half a dozen departments, each of which is positive that its own particular need is the greatest and most pressing in the museum, and so it is some time before the cast can be made. The artist is as much in demand as the moulder and *his* services are bespoke for work long planned. So are the services of other artisans who may be concerned in the making of a given piece, glass-blower, blacksmith, carpenter, each is continually and continuously wanted by somebody. So it has come about that museums are beginning to turn work of this kind over to outside parties, having come to the con-

clusion that the writer long ago reached, that the museum can not profitably engage in commercial work.

It is, or should be, I feel, one of the services of the museum to science and to the public to meet the first cost of such things as relief maps, restorations, and reproductions of fossils and antiquities, and then to arrange to place them on the market, so to speak, through other parties. There is a large amount of work of the above character, the cost of which would prohibit its execution on a commercial basis. To make, for example, an accurate relief map, demands time, knowledge and skill, all in amounts not usually at the command of private individuals, so the average relief map, made to sell, is too often of an inferior quality. The museum can not make and sell such things profitably, even for exchange, but it can bear the initial expense and thus be helpful to everyone.

The question of spare room is another sore point with large museums, and I know of at least one director who sees red and feels murderous every time, and the times are numerous, that he is asked to let some one have a room for private work. "Surely," says the applicant, "there must be a vacant room or two in your great institution." But there isn't—not even in the U. S. National Museum, which is better off as regards office and storage room than any other institution in the world. Few seem to realize that the larger a museum the wider the scope of the work and the ramification of its plans, and these may involve the occupation and use of every available room for years in advance.

So, too, with taking up some new line of work—always a temptation—each new undertaking calls not only for men but for money, time and room, almost invariably much more of these than estimated, especially in the matter of time. And each new venture *must* take something from work already in hand, make demands upon the time of a fully occupied staff, and call for space already full to overflowing.

Thus is it that many a museum not only can not do the things that are expected, or desired of it by others, but can not even do many things that its own staff wishes done.

The other man—or institution—has the things that we want and we have what he wants, but like the help and situations columns in a paper, they never get together.

The big museum is as a rule not only willing but anxious to do more than it does, but—it simply can't.

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Theragra, new genus, 1896.
Therobromus callorhini, new genus and species, 1898.

AMPHIBIA

- ¹*Placerias hesternus*, new genus and species, 1904.
¹*Metoposaurus fraasi*, new species, 1904.

REPTILIA

- ¹*Dacentrurus*, new genus, 1902.
¹*Heterodontosuchus ganei*, new genus and species, 1898.
¹*Hoplitosaurus marshi*, new genus and species, 1901.
¹*Pterosphenus schucherti*, new genus and species, 1898.

AVES

- ¹*Hargeria*, new genus, 1903.
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MAMMALIA

- ¹*Bison occidentalis*, new species, 1898.
¹*Deinictis major*, new species, 1898.
¹*Trigonias osborni*, new species, 1900.

¹ - Extinct.





