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GENERAL GUIDE  
TO THE  
**MUSEUM**  
OF THE  
**COLLEGE OF CHARLESTON**

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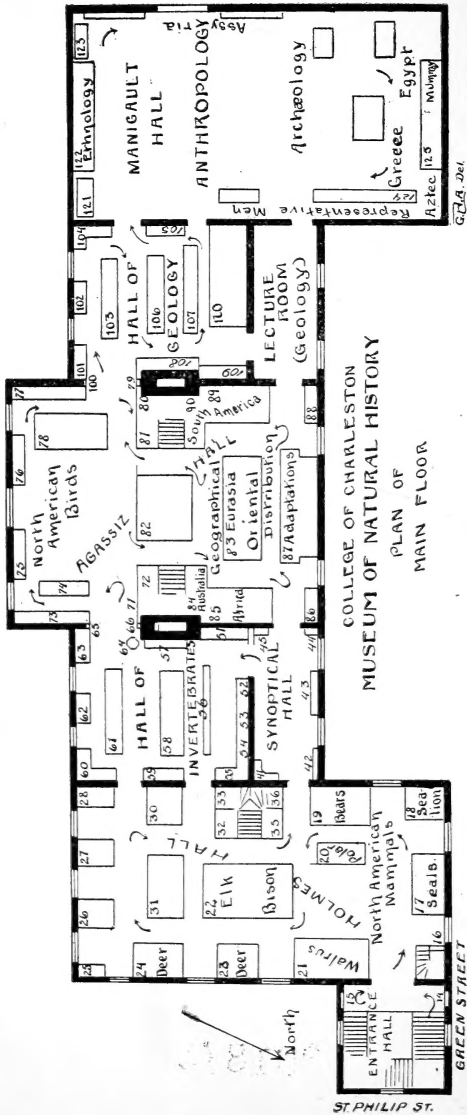
By GEORGE HALL ASHLEY, Ph. D., Curator

*SEMI-CENTENNIAL EDITION, 1851 TO 1901*

CHARLESTON, S. C.  
PUBLISHED BY THE COLLEGE







ST. PHILIP ST.

COLLEGE OF CHARLESTON  
 MUSEUM OF NATURAL HISTORY  
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# GENERAL GUIDE

TO THE

# MUSEUM

OF THE

# COLLEGE OF CHARLESTON

*Charleston, S.C.*

*Museum.*

By GEORGE HALL ASHLEY, Ph. D., Curator

*SEMI-CENTENNIAL EDITION, 1851 TO 1901*

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## EXPLANATORY NOTICE

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This Guide, the first ever published of the Museum, has been very hastily prepared, partly to meet the needs of visitors to the Exposition, but especially in commemoration of the celebration of the semi-centennial of the Museum. Its existence is due to several circumstances. The establishment of the chair of Biology and Geology in the College in 1900 made new demands, and opened up new opportunities for the Museum. Examination revealed the fact that the collections were exceedingly rich in material for illustrating the class work in those subjects, but in such a condition as to be hardly available. To make this matter of use it was found that an almost complete rearrangement of the Museum would be necessary. Believing that such a rearrangement would not only meet the needs of the College classes, but from an educational standpoint greatly enhance the value of the collections to the visiting public, as well as put the Museum in line with the methods of the leading museums of the world, the desired rearrangement was begun in October, 1901. The lack of unit cases, or of any elasticity in the shelving, and in



many cases the fact that specimens had been mounted to the floor or walls of cases, instead of on individual mounts, prevented an arrangement of the new series in anything like systematic order. However, rather than wait until new cases could be built or the old ones remodeled, for which purpose funds were not at hand, the rearranged series are being temporarily gathered together in the most convenient manner, in the hope that a more systematic arrangement may be worked out later. Considerable time must elapse before the specimens in each series can be properly mounted and supplied with full descriptive labels; and it is to bridge over this gap and to render in the meanwhile the new arrangement somewhat intelligible to the visiting public that this Guide has been prepared.

November, 1901.

## HISTORICAL

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The Museum of the College of Charleston celebrates in 1901 its fiftieth anniversary, having been formally opened to the public in November, 1851. Its beginning really dates much further back, as the nucleus of the present Museum had previously existed in the form of the collections of the old Literary and Philosophical Society. In the last part of the first half of the nineteenth century these had been deposited in the Medical College. They consisted mainly of minerals, and a few birds and quadrupeds, the latter in too poor a condition to be preserved. Some of the specimens in the Museum bear dates as early as 1827. Charleston had long been the center of a coterie of nature lovers, many of whom had rendered distinguished service to the cause of science. Such names as Elliott, Holbrook, Audubon, Bachman, and a score of others lent a luster to the culture of Charleston society at that day. Then came Louis Agassiz who focused the interest in natural history into a museum of natural history, the Charleston Museum. Rooms were appropriated at the College, and in July, 1850, the remains of the old "Museum of Charleston" were removed from the Medical College to their new

home. Prof. Francis S. Holmes was elected Curator of the new Museum on the 25th of November, 1850. At this time large and valuable contributions of skins of birds and quadrupeds, of fossils, shells, reptiles, fish, and insects, were made by Dr. Bachman, Mr. John Audubon, Prof. M. Tuomey, then the Geological Surveyor of South Carolina, and Prof. Holmes, the Curator. Private citizens also contributed many valuable and unique specimens. Indeed the list of these early contributors would be a notable one, the specimens showing the names of many distinguished travelers, both from this country and Europe, who gave liberally of the treasures they had gathered. Sea captains turned over the curious things they had garnered from the sea, and the Museum grew apace. The Museum was opened to the public in November, 1851; on which occasion Prof. Louis Agassiz delivered an address in the College chapel to a large audience. Rev. Dr. Bachman opened and closed the services with prayer. In 1861 large accessions were made to the conchological and paleontological departments by James H. Couper, Esq., of St. Simons Island, Georgia, and by the Misses Annelly of the city of Charleston.

During the latter part of the war of Secession, the minerals, fossils, shells, and other small specimens were removed into the interior of the State, as were

also the originals of the figures illustrating the work on the "Quadrupeds of North America," by Audubon and Bachman, which had been presented to the Museum by those gentlemen. The records, books, papers, and three or four boxes of valuable specimens in natural history were destroyed by fire, the act of incendiary negroes, together with the valuable library of the curator, Prof. Holmes. In 1865, the specimens contained in some two hundred large cases were brought back, and on June 1st, 1866, the Museum was again opened to visitors.

In 1869, Prof. Holmes resigned and was succeeded by Dr. Gabriel Manigault. For thirty years, until his death in October, 1899, Dr. Manigault continued as the curator, the collections growing steadily and rapidly under his hand. Everywhere there is evidence of his painstaking care in the hundreds of well mounted skeletons, the cases, shelving, and mounts of the specimens, much or most of which are the work of his hand. In his last years he planned and carried into execution the opening of a new department, that of archæology. In 1900, a chair of Biology and Geology was established in the College, to which the writer was appointed, being appointed at the same time Curator of the Museum.

## INTRODUCTORY

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Through all the ages nature has ever been an object of worship and reverence, of admiration and wonder, rather than of scientific study. Indeed the sciences of geology and biology to which the term natural history is often restricted can claim an antiquity of but little over one century. First came the random descriptions of travelers, yielding a storehouse of facts and fancies about the more striking plants and animals, and paving the way for the first step in a scientific study of nature's forms—the grouping of the forms already known, according to real or supposed similarities. This proved the foundation stone of the sciences of zoölogy and botany. This was followed by the days when the sole ambition of the majority of naturalists was to discover and name some new form. The text-books of that day became simply classified lists of names, and the museums became simply classified displays of natural objects. Thus were gathered a mass of facts ready for the next step. That step was, first, the realization that the resemblances forming the basis of classification were due to actual relationship. Then followed the realization that instead of living forms being unchangable

“medals of creation,” every plant and animal, and every part of each, was the sequel of historical events running back to the beginning. Then men began to leave the mad hunt for something new and rare, and, turning to the everyday forms about them, seemed to see an interrogation point in every bone and sinew of every animal they met. They forgot to hunt for new birds when they began watching the marvelous transformation of a hen’s egg into a chicken. Instead of nature being full of paradoxes, a museum of curiosities, each of which rivaled its neighbors in grotesqueness, with seemingly no purpose in existence except to excite the wonder of men, they found they had been looking at the wrong side of a tapestry, as it were, and it only needed a change in the point of view to see nature revealed as a beautiful design, and all the parts, that, considered by themselves, seemed so grotesque, to be but necessary parts of one figure. They found enough to make them believe that every form in nature was a response to the slow action of the laws and forces to which had been committed the working out of the design. And so today men value forms, not because they are new or old, but only as they add to a better understanding of the design and purpose of nature as a whole. Today men are studying the forms of nature not alone for themselves, but for light on the laws and forces

which produced those forms, with the hope of learning the great general laws and principles of nature.

Nature study is yet in its infancy. The laws in biology or geology that can be considered as proven are comparatively few, but a host of hitherto unsuspected relations have been revealed, and these lend a new interest to the whole study. One of the pleasantest features of the new point of view is that the phases of life that are to-day largely absorbing the interest of the savant, are those that prove of most interest to the tyro. The text books have been quick to seize the opportunity, and the latest and best books in zoölogy and botany to-day are almost entirely devoted to topics that formerly were briefly dismissed in a chapter, often added as an appendix. The Museum has been slower in giving space to the newer views of life and nature, partly from its conservative character, and partly from the difficulty of representing relations involving action by the use of stuffed skins of dead animals, or dried and pressed plants. This Museum, because of the lack of stimulus in that it was not used for illustrating class work has up to the present year made no attempt to illustrate the ecology, comparative morphology, history, or economics of plants or animals, and only to a slight extent has it illustrated their classification. The introduction of the study of biology and geology in the College curricu-

lum in the past year, however, has rendered it necessary or desirable that the material used to illustrate the present day treatment of those studies be gathered together for ready consultation. To do this has meant a nearly complete rearrangement of the Museum. Such a rearrangement as stated above was begun in October of this year (1901).

Some of the objects to be sought in the rearrangement are as follows :

That every specimen on display should teach some lesson, or should be a necessary part of a series teaching some lesson. A corollary of this is that every specimen that does not teach something should be removed from the display collections to some place accessible to students, but where it need not inflict itself upon the public. A second corollary is that every specimen should be accompanied by descriptive labels, and whatever else, such as photographs, diagrams, maps, etc., may be necessary to make clear the lesson it is to teach. This means that the former often monotonous succession of related forms, or occasional unmeaning association of unrelated forms, will be replaced by small series, each grouped about some central idea, with the group as a whole as well as the individual specimens labelled and explained.

In the second place the attempt will be made to follow the pedagogical precept " From the known to



the unknown," by the use of some untechnical word or some object already well known to the observer, to connect his previous knowledge with the idea to be illustrated. Thus: "The Cormorants" on a label means more to most people than "Phalacrocoracidae" does; it is, therefore, given the prominent place on the family label.

## THE COLLECTIONS

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The collections of the Museum will be found grouped under the following heads : Geology, Botany, Zoölogy, Anthropology. And under these heads the collections will be grouped in the following series:

Descriptive series, illustrating the meaning of terms used in describing objects in that division.

Synoptical series, showing examples and the distinguishing characters of the principal subdivisions of the larger groups.

Systematic series, showing in greater detail the classification of objects in each class.

Morphological series, displaying the external forms of objects, their internal structure or anatomy, and their minute structure or histology.

Historical series, revealing the stages in the development of the individual—ontogeny, or of a branch or family—phylogeny, or of life as a whole; this includes embryology, the metamorphosis of animals, paleobiology, etc.

Distributional series. This series, intended to show the natural occurrence or distribution of forms, includes most of the exotic animals of the Museum. It

also includes the different series of local or regional forms.

Ecological series. Here are exhibited the actions of the animal and plant as a whole; its habits; and its relations to other forms, whether as friends or enemies, or as prey, to its physical surroundings, as temperature, humidity, etc.—in general to its environment.

Economic series, including the plants, animals, minerals, and rocks of use to man, with often the methods of obtaining and utilizing them.

## SYNOPSIS OF COLLECTIONS

### GEOLOGY

Composition of the earth:	<i>Hall</i>	<i>Case</i>
Descriptive mineralogy..	Geology	101
Systematic mineralogy..	“	102
Rock formation.....	“	104
Systematic lithology....	“	104
Form of the earth.....	“	(c)
Structure of the earth.....	“	(c)
History of the earth :		
Geography at different pe- riods.....	“	(c)
Characteristic rocks of dif- ferent periods.....	“	(a)
Characteristic life at dif- ferent periods.....	“	106

Economic series:	<i>Hall</i>	<i>Case</i>
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Processes and products...	"	(c)
Building and architectural stones.....	"	107 (a)
Fuels.....	"	107 (a)
Gems.....	"	107 (a)
Miscellaneous.....	"	107 (a)

## BOTANY

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Synopsis of orders.....	Synoptical	43
Systematic series: The Biltmore, Elliott, Ravenel, and other herbariums	{ Holmes Agassiz	Galleries.
Morphological series:		
Types of roots, shoots, etc.		(a)
Historical series: evolution of sex, paleobotany, etc.....		(a)
Distributional series: local collections.....		(c)
Plant societies.....		(c)
Geographical distribution..		(c)
Vertical distribution.....		(c)
Ecological series: dispersal of seed.....		(a)
Flowers and insects.....		(c)

	<i>Hall</i>	<i>Case</i>
Light relation of plants..		(a)
Struggle for existence....		(c)
Carnivorous plants.....		(c)
Economic series:		
Seeds and grains.....		(a)
Fruits and berries.....		(a)
Woods and timber.....		(c)
Leaves, roots, and other parts .....		(c)
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ZOOLOGY		
Synoptical series :		
Orders of Invertebrates	Synoptical	42
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	<i>Hall</i>	<i>Case</i>
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Special homologies: limbs	“	“
Special homologies: teeth	Agassiz	86
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Metamorphosis of ver- tebrates.....	“	16
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Australian province.....	“	84
Eurasian province.....	“	83
African province.....	“	85
Oriental province.....	“	83
Local collections.....		(a)
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Ecological Series: adaptations for self defense.....	Holmes	32
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Adaptations for care of young.....	“	63
Adaptations for securing food.....	{ Holmes	35
	{ Agassiz	82
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Locomotion of animals...	Agassiz	87
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Light relations of animals	“	66

## Economic series :

Edible series among invertebrates . . . . .	(a)
Game birds and fishes. . . . .	(b)
Animals yielding furs, feathers, skins, etc. . . . .	(b)
Pearl shells, etc. . . . .	(a)

## ANTHROPOLOGY

## Archæology :

## Prehistoric

Time series. . . . .	Anthropology	(c)
Functional series. . . . .	“	(a)
Geographical series. . . . .	“	(c)

## Historical:

Egyptian. . . . .	“	125
Assyrian. . . . .	“	
Greece and Rome. . . . .	“	125
Aztec. . . . .	“	
Local. . . . .	Entrance Hall	15

## Ethnology :

Functional series. . . . .	Anthropology
Geographical series. . . . .	“

## Representative man.

Representative men of South Carolina. . . . .	“
Representative men of France, Rome, etc. . . . .	“



## NOTE

(a) The material for these series is in the main at hand, but at this writing has not been arranged.

(b) These series are at present left in the regular systematic series, but are distinguished by the marked labels.

(c) These series are still in the initiatory stage, and will not be put on display until a larger amount of material has been gotten together.

The above outline has been prepared to meet the most immediate needs of the classes in Biology and Geology. It is capable of almost unlimited expansion, as the necessary material can be secured and the necessary time found for its arrangement and labelling. As will be evident from the case references, at the time this Guide goes to press the new series in Botany exist only in plans, and in Geology the full exposition of the material on hand must be delayed until funds warrant completing the cases in the gallery. Meanwhile selections to indicate the scope of the different series are being prepared and will be shown as far as the present cases will permit.

In the same way examination of many of the new series will reveal that the present Museum specimens serve only as a nucleus, around which it is hoped to gather much new material, eventually serving to illustrate quite fully a large number of the principles of natural history.

## ENTRANCE HALL

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The only objects at present on the lower floor of the Entrance Hall are the bones of the large whale formerly on display in the Museum. It was displaced by the much smaller but more perfect specimen in the gallery of Agassiz Hall. This specimen must have had a length in the flesh of over 60 feet.

To the right of the first flight of stairs is a slab of Triassic sandstone from the Connecticut valley, showing large footprints. Thousands of such footprints have been found, and for a long time were supposed to be those of birds. Later it was found that they were made by huge reptiles with many bird-like characters, called the Dinosauria. The pelvis and hind limbs were much like those of the ostrich, while in many species the fore limbs were so small proportionally as to be of little use for locomotion. Certain of this group were the largest land animals known, the *Atlantasaurus* being sixty to one hundred feet long.

*Fossil Bones from Charleston.*—The mention of elephants usually carries the mind to Africa or Asia, but the extensive mining of phosphate near Charleston has revealed that at an early date, probably before

the coming of the red man, the vicinity of Charleston was, one might almost be tempted to say, overrun with the mammoth, the mastodon, the equally huge mylodon, the horse, and many another form that would cause surprise, or in many cases consternation, should one of them wander down the streets of the present city. At a somewhat earlier date Charleston and its vicinity were under the sea, and a sea swarming with whales, with manatees, with sharks many times as large as any to be found here now; in fact, many of the teeth indicate fish sixty to eighty feet long. (See Case 31.)

*New Accessions.*—At the right, as the top floor is reached, is a case in which is placed new material not as yet distributed among the collections. Many of the specimens are transferred immediately to the collections upon their arrival. In such cases attention is called to the new material by means of the bulletin board.

*Historical.*—Across the hall is a case devoted to historical relics of Charleston and the State. On the opposite walls are a large leather back turtle and the jaws of a sperm whale. Note the large teeth and compare with the jaws of the Right or Greenland whale in Agassiz Hall.

## HOLMES HALL

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This hall contains on the main floor the North American Mammals, with a few special series illustrating animal life. The south gallery contains the Biltmore Herbarium. The north and west gallery contain mammalian skeletons, showing general homology of the bones. The hall is named from Prof. Francis S. Holmes, the first curator of the Museum.

At the right, as one enters this room, is a small box containing the pieces of a human fossil skull. The rest of the skeleton is in the British Museum. This is one of the few instances of an actual human petrification. The bones are those of a Carib killed in battle over two hundred years ago and preserved in modern limestone forming on the coast of Guadalupe at that time.

*Metamorphosis.*—To the right, beyond the stairs to the gallery, is a case containing the beginning of a series illustrating the metamorphosism of animals. It is hoped in time to build up a most interesting series along this line. At the top is the beginning of a series illustrating the various types of eggs of animals, varying from the large ostrich egg to the minute eggs of insects.

The north end of this room contains the seals and their relatives. Here are to be found representatives of nearly all of these forms to be found along the North American coasts. The Pinnipedia, as they are known scientifically, are carnivorous mammals adapted for life in the water. Clumsy on the land they are thoroughly at home in the sea, which they leave but seldom and only for short times. Their food is fish, mollusks, and crustaceans. Many of them are strictly Arctic, while others are found well down in the temperate belt.

*Seal Family.*—The family of seals and two sea lions in the cases at the end of the room belong to the eared group of seals, those shown all being confined to the Pacific coast. They are polygamous, the males greatly exceeding in size the females. This is well shown in the family of seals, where the male is not only about three times as large as the female, but in life roars like a bull, in strong contrast to the female which bleats like a sheep.

*Sea Lion.*—The Stellars sea lion grows to be 10 or 12 feet long and to have a weight of from 1200 to 1500 pounds. The fur seals are the ones so extensively killed for their fur on the Prybilov Islands, Alaska, and which have nearly involved our government in serious trouble. They are now rapidly becoming extinct.

*Walrus.*—The walrus here shown is the Atlantic species. Note in the skeleton that the long tusks are the greatly enlarged upper canines, the incisors being wanting. These the animal uses in digging up mussels and to assist in climbing upon the ice, or on the land. The walruses are closely related to the seals just described. Ranging up to 12 feet long, they weigh from a ton to a ton and a half. Less closely related are the three other forms in the Museum, which are known as the earless seals. The little one in the case with the polar bear is the common harbor seal. It was captured in the harbor here, a fact of interest since it had not before been found so far south.

*Seal.*—The harp seal is more strictly northern in range. These, as are the harbor seals, are much hunted for their skins and oil, though they do not have the fine soft coat of underfur that gives the fur seal its great value.

*Seal.*—The hooded seal in the lower case south of the steps to the gallery may be mentioned here. They are readily distinguished by the large movable muscular bag on top of their heads. The hood is found only on the male. Like the last it is an Arctic species. They are from 6 to 8 feet long and will weigh from 500 to 900 pounds,

*Bears.*—Next to the sea lion is the bear case. Here is the black bear, the only bear found in Eastern North America, though it ranges all over the continent. It is subject to some variation, of which the Cinnamon bear, so called, is the most marked. Back of them is the Grisly, the most formidable of the bears and perhaps the most dangerous of the wild animals of America. Those who have read Mr. Seaton-Thompson's delightful description of the grisly bear in the "Story of Wahn" will need no introduction here.

*Polar Bear.*—Then comes the Polar bear in the case just in front. This is probably the largest of the bears. It ranges through the Arctic regions of North America, Europe, and Asia, usually keeping near the coast, and often being found on the ice far from land. They are good swimmers, a fact of great help to them in picking up a living in that region. With this one are placed the Arctic wolf and the harbor seal, two of his neighbors of the far north. Note the white color of the land animals, the dull color of the seal, in each rendering them inconspicuous in their usual environment.

*Bison Family.*—In the north side of the large case in the centre of the room is the family of bison or buffalo, as they are often called. Though formerly

ranging nearly or quite to the Atlantic seaboard, and though as late as 1870 millions of these animals ranged the western plains, by 1883 they had been practically exterminated. There still remain a herd of twenty on Antelope Island in the Great Salt Lake, about 400 in Yellowstone Park, 75 in a private herd in Texas, 200 in a private herd at Cavalli, Mont., and a few others in Zoölogical gardens and private herds. In captivity they have been successfully crossed with polled Angus cattle.

*Elk Family.*—In the south end of the same case is the family of the American elk or wapiti. They live in the north and northwest part of the United States and northward to the 57th parallel. They live in small families of six or seven in the woods, feeding on grass and young shoots. The hide is valuable because it does not harden after getting wet.

*Eastern Deer.*—Just east of the last is the case of Eastern deer, containing the common Virginia deer and the Caribou or American reindeer. It is believed that the latter is the same as the well known reindeer of Europe, so invaluable to the Laplanders and others of that continent, though it has not been domesticated in this country.



*Western Deer.*—In the next case are shown the white-tailed variety of the Virginia deer and the long-eared mule deer. The latter inhabits the sides of the mountains.

*Dogs.*—In the next case are the dogs. Here is the common wolf which is, or has been found, all over North America, northern Europe, and northern Asia. The cayote, or howling wolf, is abundant in the west. Here are also the common foxes, both the grey and red, or, as it is sometimes called, the cross, silver, or black fox. As indicated by the common names the latter is widely variable in color. It occurs in Europe as well as in this country.

*Rodents.*—The next case is of interest as containing nearly all the non-domesticated animals that we meet in our daily life, or in our trips to the country. They all belong to the order Rodentia, the rodents or gnawing animals. Here are the rats and mice that infest our houses, the cotton rats and field mice, and many others. Here are the squirrels and gophers, the chipmonks and woodchucks or ground 'hog. In front is the beaver group and one of the trees they have cut off for building their dam. Here are the pouched gophers, with their large cheek pouches, opening outside the mouth. The porcupines are represented by one species, and the hares by several.

Notice that all have the long sharp-edged incisors and no canines.

The floor case at the right contains a miscellaneous collection of fossils, most of them being from the vicinity of Charleston.

*Weasel Tribe.*—Beyond the rodent case are the carnivorous animals grouped together as the weasels. Most of the animals are of value for their fur. Here are the minks, sable, weasels, otters, skunks, and the larger forms—the fishers, wolverines, and badgers.

*Cats.*—The next case contains the cats, of which the most important is the puma. This cat ranges all over the American continent, and has figured abundantly in the annals of the early settlers, under the names of panther, painter, catamount, cougar, and in recent contemporary history it has occupied a prominent place in the public eye under the name of Rocky Mountain lion. The wild cat shown above is still abundant in the swamps about Charleston.

*History of the Ammonites.*—This case has been prepared as a sample illustrating how museum material can be used to tell a story. It is designed to illustrate the rise, reign, and decline of the ammonite group of shells. During the so-called Reptilian Age the ammonites flourished in great abundance, thousands of species having been described, many of them

of great size. The specimens show their appearance at the dawn of geological time as straight shells with simple concave partitions or septa ; their gradual development into bent, then curved, then coiled forms ; then the change from simple to highly corrugated septa, with other changes ; their period of prominence ; and finally their decline, when they again assume the straight forms of their youth, though maintaining the internal structure of the adult. At the end of the Tertiary they become suddenly extinct, and are to-day represented only by one of the early type forms which survived—the Nautilus.

*Rocky Mountain Goat, etc.*—This case contains some of the hoofed animals to be met with in the Rocky Mountain region. Here is the long-haired goat, and the much better known big horned sheep. This is the animal about which such tales are told of marvelous leaps from perpendicular cliffs, the truth or falsity of which does not yet appear to be settled to the satisfaction of everybody. With them is the prong-horned antelope, the only antelope found on this continent. The antelopes stand between the goats and the deer, differing from the latter, among other things, in that the horns are hollow and perennial. They are among the most graceful of animals.

*Animal Life : Self-Protection.*—In the case on the left of the gallery stairs will be noted, at the top, various animals whose protection consists of spines all over, the globe fish, the pin-cushion fish, and others, the hedge-hog that would make an ugly mouthful for a fox, the lizard commonly known as the horned-toad, the sea-urchin, and so on down the line. Other animals depend upon the thickness and strength of their outside covering, as do the turtles in general, but especially the box turtle shown here, which can not only withdraw into his shell, but can close that shell up completely, till he is as snug as a bug in a rug. The crabs are protected by their thick armor, and most of the mollusca secrete a hard shell into which they withdraw in time of danger. Many of the animals best adapted for offense find the same weapons of use in defense; teeth, claws, and other parts may come handy at times. The rattlesnake shown not only has poisoned fangs but a bouy rattle that often wards off danger. Many animals take advantage of mistaken identity to escape danger; thus the hog-nosed snake, or hissing adder, a harmless snake, is usually let alone under the impression that he belongs among the poisonous group of snakes; the lizards and salamanders as a class are generally let alone because of their resemblance to snakes. Some insects escape because birds learn that they are not

good to eat. Such forms are apt to be brightly colored so that birds can recognize them before sticking their bills into them. Strangely enough numerous cases are known where edible species when not abundant have found safety in assuming the colors and markings of the inedible forms, as is shown by the three butterflies. In a vast number of cases animals escape because of their resemblance to their surroundings. The little green parrot keeps among the green foliage of the trees; the ducks are white beneath so that they cannot be seen by fish below against the white sky, and dark above so that larger birds above cannot see them when looking down into the dark depths of the water. The white Ptarmigan is one of a class of animals that spend their winters in snow-covered areas, during which time they are white, but become ash-colored in summer. Notice the Arctic animals in general that live on the land. The desert grouse, like the horned toad, dresses in a livery of grey. Notice the two crustaceans shown; do you think you could see the big fellow on a gravelly bank? You have doubtless looked many a time at the large moths shown against the bark without seeing them. These resemblances among insects are the rule rather than the exception, as note the grasshopper. Sometimes this resemblance to particular objects is most striking, as in the case of the little pupa on the twig, or the

common walking sticks which commonly pass as branches of the twig on which they are standing. The East Indian butterfly, shown in the middle front of the case, is one of the most striking illustrations of the extent to which this protective resemblance is often carried. The resemblance to a leaf does not need pointing out.

*Animal Life: Securing Food.*—The case on the right shows some of the ways animals have of getting food. On the top shelves are a series of birds, showing how the different classes of birds are adapted to different kinds of food or different methods of obtaining it. Notice that the woodpecker has not only a stout bill for digging the worms and grubs out from under the bark of trees, but his feet are specially adapted for clinging to the perpendicular face of the tree. The kingfisher has a large bill for catching fish. The hawk, as a type of the birds of prey, has not only a hooked beak for tearing his prey, but stout claws for seizing it. The duck has webbed feet for swimming and the flat spoon-like bill for digging up the mud. Notice the long, slender, curved bill of the humming bird for getting the nectar of flowers, and the medium-sized bill of the blue bird for worms and seeds.

The birds are not the only animals that have no teeth with which to seize their prey, as is illustrated by the snapping turtle. Here is a type of the Carnivores, armed with powerful limbs for the chase, powerful claws and large canines for seizing and holding the prey when caught up with. Here is a type of the herb-eating animals armed with long sharp-edged incisors for cropping grass or shoots. The squirrel uses similar teeth for gnawing into nuts for the meat. The crab has powerful clawed arms, with one of which he anchors himself, while with the other he seizes his prey.

Here is a black snake that crushes his victims in the coils of his body, and in a sense the bears might be put in the same class. Next to him is the copper-head snake that uses poison in securing his food, and in the same class comes the scorpion and tarantula. The Fish show many modifications. Here is the sting-ray, generally reputed to be poisonous, because of the danger of blood poisoning setting in from the slime covering the sting and the ragged and unclean cut made. The shark has to turn over on his back to seize objects near the surface, while the form back of it has a broad duck-like bill for digging in the mud. On the other side are two illustrations of a class of animals known as parasites, that live on the food prepared by other animals. The tape-worm

is one of the parasitic forms living in man. The lamprey eel has a round mouth armed with teeth like a diamond drill, with which it bores its way into the bodies of other fish and lives on their flesh.

The remora illustrates commensalism, that is, the association of animals of different kinds, in which the two live in harmony and often to their mutual advantage. The remora attaches itself to a shark by the disk on its head and is carried about for weeks, only leaving its host to make sudden dashes off for food.



## SYNOPTICAL HALL

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This hall, which up to the last part of this year, has formed the entrance hall, at present contains series illustrating the types of elements, minerals, and rocks composing the earth, and examples of most of the orders of plants and animals. It has just been started and it will take some time to complete it, but it is hoped that when completed it will illustrate by means of mounted specimens, dissections, charts, etc., the important characteristics of all the orders of animals and plants, as well as the composition of the earth. The series begins at the further door and proceeds to the right. The first case starts at the top with a sample of an aërolite, commonly known as a meteor or shooting star. Then come the most common elements of the earth as far as obtainable, with squares back of each to indicate its relative abundance in the earth's crust. Next come the most abundant minerals. Below is given a short series indicating the basis of classification of minerals. In the case on the opposite side of the door are examples of the different classes of rock. The next case displays examples of the classes and orders of plants, beginning at the lowest, arranged

according to Coulter. Then come the invertebrates, and in the last case the vertebrates, the arrangement in the last two cases following the classification of Parker and Haswell. This series, when properly labeled up, should form a key to the systematic collections of the Museum.

On the walls are shown the only well mounted fish possessed by the Museum, a group representing the struggle for life, horns of the American and European elks, and busts of eminent naturalists. It is planned to use this room as a lecture room in Biology.

## HALL OF INVERTEBRATES

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At this writing almost nothing has been done toward the rearrangement of this room except to remove most of the geological material formerly stored here and to gather here some of the invertebrate material scattered elsewhere.

The plans for this room contemplate a cleaning, labeling, and remounting of the corals; the preparation of drawer cases so that material not to be displayed or now in storage can be made available to students or others interested; and the preparation of the following series, among others, for exhibition:

Synoptical series of families of mollusca.

Complete series of the marine, freshwater, and land shells of South Carolina.

Small series illustrating the more interesting and typical shells of other provinces, as the Pacific Coast of the United States, etc.

Distributional series showing vertical range.

Life series showing growth and development of well known forms, etc.

Economic series, edible series, with maps showing their distribution, etc.

Shells yielding mother-of-pearl, pearls, shells used for the manufacture of buttons, etc.

Shells of historic, poetic, or other interest.

The arrangement of similar series in the other branches of the invertebrates, as far as the material will permit.

The Museum is very rich in mollusca, and has many interesting and valuable specimens in the other branches of the invertebrates, though it would appear from the labels that much valuable material, especially in the line of insects, had been lost through the ravages of museum pests.

*Homes and Home Life.*—On the left as we pass from this room is a case showing the homes and home life of animals. Here are types of bird nests, the nests built of rushes on the ground, the tiny humming bird's nest high up in a tree, the swallow's nest of sticks glued together and plastered to the inside walls of a chimney. The long hanging nest of the oriole calls attention to the general rule that birds colored to resemble their surroundings usually build open nests, while those that are brightly colored build such nests that the birds will be hidden when they are sitting on the eggs.

Then come the nests of insects. Here are the nests of the hornets or paper wasps, as a type of the communal insects, and a nest of the mud-dobber as one of the insects living alone. Here is the nest of the trap door spider and other forms. A few forms

show adaptation for the defense of the young, as the marsupials, which have the large pouch on the abdomen for the reception of the young (see Australian case.) Then come a series showing sex dimorphism, or differences in the sexes. The ducks and fowls show this most prominently, and in many insects it is carried still further, in many forms one sex being winged while the other is wingless, etc. Hardly a beginning has been made in this series, which it is hoped may be developed into several most interesting collections.

## AGASSIZ HALL

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This hall, named after Professor Louis Agassiz, to whom in a large measure the Museum owes its existence, contains on the south side the collection of North American birds, and on the north side cases illustrating geographical distribution, morphological adaptations to various functions, etc.

*Light Relations of Animals.*—At the right as we enter this room is a small case containing the beginning of a series to illustrate the light relations of animals. Here are blind fish from caves, which, preferring the darkness, have lost the use of their eyes. With them is the mole who has little use for his small eyes well covered by his fur. Here are the fireflies as a type of the animals with the power of yielding a phosphorescent glow. Many fishes and the lower marine forms possess this in a high degree. Below is the owl with his large eyes prepared to catch the faintest amount of light. But notice in the hawk owl, or daylight owl, that when an owl takes to flying in the daytime, it also assumes the appearance of a day flying bird. And on the other hand the night parrot from New Zealand illustrates the fact that when one of a class of day fliers becomes nocturnal, it comes

to resemble the owls or night flying forms. Here are insects with large compound eyes, the starfish with eyes at the end of his rays, etc.

Entering the room we come first to the systematic collection of North American birds. The game birds and the dates between which they are in season are being indicated on the labels.

*Diving Birds.*—The first case at the right contains the diving birds, which belong to the Order Pygopodes. It contains the auks, loons, grebes, puffins, etc. Most of these are Northern birds. They are quick divers, and can swim under water for a considerable distance, but are scarcely able to walk at all on land. Though the wings are usually very short, some of them fly well.

*Birds of Prey.*—Then come the birds of prey, or birds of the order Raptores. Here are the eagles, hawks, and falcons, while in the lower case are the vultures, and the owls or nocturnal birds of prey. As a rule the birds of prey which are world-wide in their distribution live on birds and mammals which they capture alive. The vultures live on carrion. The owls feed on small mammals at night. Here is the symbol of the republic, the bald eagle.

*Swimmers.*—Turning back to the left, the case at the end of the room contains the short winged swimming birds, the ducks, geese, and swans, all making

up the family Anatidae of the order Lamellirostris. Many of these birds are rapidly disappearing before the "sportsman."

*Wading Birds.*—The next case contains the wading birds of the orders Herodines and Alektorides, including the herons, cranes, egrets, rails, bitterns, etc. Many of these birds, notably the egrets, have been or are being rapidly killed off to supply the demands of fashion.

*Pigeons, Swifts, Shore Birds, Fowls.*—In the next case are the rest of the wading birds, known as the shore birds, making up the order Limicolæ. Here are the plovers, sandpipers, snipes, the killdeer, and other well-known game birds. The tip-up bobbing along the edge of small pools of water, the plover flying along the shore or picking up worms, are familiar to all. Below them in the same case are the fowls or birds of the order Gallinacei, the most valuable birds of all from a purely economic, or, shall I say, gastronomic standpoint. Here is the wild turkey, and in this order belongs our common barnyard fowl, though it is not a native of North America. Here are the grouse, partridge, quail, and prairie chicken. Strict game laws in many of the States is all that is preventing the practical extermination of many of this group. The wild turkey formerly oc-



curred all over the United States and Mexico. It was first taken to Europe in 1524, was domesticated there, and now occupies much of its former habitat as a domesticated fowl. On the top shelf at the left are the Columbinæ, or pigeons and doves. On the top shelves on the right are birds of the order Cypselomorphæ, the swifts, goat-suckers, and the midget-like humming birds. Here are the night hawk and the whippoorwill, noted for its characteristic night cry.

*Perchers.*—The next case contains several hundred of the little birds that make up a large part of bird life of the average landscape. They are the birds of our gardens, fields, and woods, which give an undertone of melody to the roadsides and fences. These are the Passers or perching birds. Here are the sparrows, a single family that comprises about one-seventh of all the species of birds in the United States; here are warblers, the chickadees, the wrens, the creepers and nutthaches, the vireos and shrikes, the wax-wings and swallows, the tanagers and orioles, the crows and blackbirds and jays, the fly-catchers, the courageous king-bird, the pewees, and the water-loving phœbe.

*Woodpeckers.*—The small case directly in front contains the woodpeckers belonging to the order Picariæ.

*The Gull and his Relatives.*—Then come the long-winged swimming birds of the order Longipennes, the gulls, petrels, and terns, that used to occupy such a large place in any coastwise picture.

*Cormorants and Pelicans.*—Below are the pelicans, gannets, cormorants, and the long-necked snake-bird of the order Steganopodes. The floor cases contain eggs and nests.

*Struggle for Existence.*—The south side of the large case separating the two parts of this room contains a series illustrating the struggle for existence as exemplified in bird life and typified in the plaster figures. Here are kites picking up their dinners of shells; two of the groups suggest the dangers to which the birds are subject before they see daylight, and often, as seems probable in these cases, they are destined never to have that privilege. But should they escape the dangers of youth, their life-insurance rates are rendered high by the constant prospect of falling prey to some fox or hawk, as suggested in the groups to the right and left. On the east side of this case are illustrated some of the birds that have become extinct, from the huge moa of New Zealand, probably the largest bird that ever existed, to the much smaller birds of the Jurassic age, when birds had teeth. Some twenty species of moas have been found in New Zea-

land, of which the skeleton here belongs to the largest type, which often had a reach of fourteen feet. The dodo, of which a cast of the head is shown, was a large ungainly bird, resembling a hugh fledgling pigeon, that became extinct on the island of Mauritius some 250 years ago. A number of skeletons of striking forms of birds are also shown here.

*Series Illustrating Geographical Distribution.*—This series occupies the long case in the north part of this hall and the six cases east and west of it. “The laws governing the distribution of animals are reducible to three very simple propositions. Every species of animal is found in every part of the earth having conditions suitable for its maintenance, unless—

“(a). Its individuals have been unable to reach this region, through barriers of some sort; or—

“(b). Having reached it, the species is unable to maintain itself, through lack of capacity for adaptation, through severity of competition with other forms, or through destructive conditions of environment; or—

“(c). Having entered and maintained itself, it has become so altered in the process of adaptation as to become a species distinct from the original type.”—

(*Jordan.*)

For land animals the barriers may be oceans, mountains, large rivers, heat, and cold. The continents

and temperature limit the sea forms. The sea and water falls are among the barriers to fresh water forms.

The way the brown rat, introduced into this country about 1775, crowded out the black rat, which in turn had, when introduced in 1544, crowded out the native rats, gives a good illustration of species unable to hold their ground. The English sparrow is furnishing us other examples.

Many islands furnish examples of the operation of the third law.

As a result of the operation of these laws through past time we find the present distribution of animals such that it is possible to divide the earth's surface up into three realms: (1) The Australian, comprising Australia, Tasmania, New Zealand, New Guinea, and the neighboring islands; (2) the South American realm, comprising South America, the West Indies, and North America to the frost line; (3) the Northern realm, divisible into four provinces: North American, including the rest of North America; African, including Africa south of the Desert of Sahara, southern Arabia, and Madagascar, though the last is sometimes set off by itself; the Oriental, comprising Asia south of the Himalaya and Sulaiman mountains, together with the neighboring islands; and the Eurasian, including all Europe, and the rest of Asia and Africa.

*Characteristic Australian Animals.*—The Australian realm has been called a sort of biological museum. Its forms are almost all peculiar to itself, but similar to forms that flourished elsewhere over the globe many geological ages ago. It is like an old fashioned village, shut off from the rest of the world, still preserving the fashions of a forgotten age. Its mammals are nearly all either egg-layers or pouched animals, of which our opossum is the only outside representative. The former is represented in the case by the little duck-bill, with its web feet and broad bill like a duck. It lays eggs and suckles its young. The pouched animals are well illustrated in the osteological series, and are represented here by one of the smaller kangaroos.

The birds are as peculiar as the mammals. Most swans are white, but the Australian swan is black. The large almost wingless emu has a coating more nearly resembling hair than feathers. Then above is the apterix or kiwis, whose egg weighs a quarter as much as does the bird. Numerous parrots and cockatoos enliven parts of the region, while the birds of paradise are perhaps the most beautiful birds in the world. Upon the top shelf stand a pair of lyre-birds, which Gould in his "Birds of Australia" suggests are so typical that they deserve to be made the national bird of that continent.

*Characteristic South American Animals.*—The Neotropical or South American realm is the richest of all in species, because of its isolation, its varied conditions, and its past geological history. It contains more than half of all the vertebrate families of the world, and more than one-fourth of these families occur nowhere else. The order of edentates is the most characteristic one here. It was formerly represented in this area by many huge forms, though the present day survivals are small. Of these we have shown the armadilla with his bony coat of mail, within which he can roll himself in time of danger. At other times he will be found burrowing in the sand hills like a rabbit. Upon the shelf at the back are two of the ant-eaters, with their long toothless snouts through a small hole in the end of which they protrude their sticky tongues after ants. Below them is the family of sloths. Notice how their feet are adapted to a life spent in constantly hanging to the under side of a branch. The ancestors of these animals were among the largest of known mammals. The South American monkeys differ much from the Old World types, as shown by the prehensile tailed monkeys and the interesting little marmosets that go skipping about the trees like squirrels. The camels have four representatives on this side of the Atlantic, of which two are shown here, the llama, which has long been of

great value to the Peruvians as a beast of burden and for its meat and wool, and the alpaca, from the wool of which the well-known alpaca cloth is made. Valued on the same account is the little chinchilla that furnishes the delicate chinchilla fur. Among his interesting relatives here are the capybara, the largest of the order of rodents, and the well known guinea pig. Allied to the true pigs is the peccary shown here. Among the beasts of prey the puma seen among the North American series is a native of South America as well, and the jaguar shown here will fall but little short of the royal Bengal tiger of India in power and fierceness. He is restricted to South America and is often compelled to lay down his life for his skin, which on account of its markings is highly valued. The ocelot and other cats are good climbers, often following birds to their nests. Five-sixths of the birds of this region are said not to occur elsewhere. There are nearly 400 species of humming birds, where we have one. Here are the huge condors, the largest of flying birds, and the king condor in the other case, with his brightly colored head. Here is the resplendent or paradise trogon, or quezal, probably the most beautiful bird in America. Living only at altitudes above 5,000 feet, it is very rare. It is of interest as being the sacred bird of the ancient Mayas and the national bird of Guatemala, appearing on the coat of arms and

on the stamps. In early days its plumes were exacted as taxes by the Aztec chiefs.

In this realm lives the anaconda and boa constrictors, the largest of sea serpents, turtles, alligators, crocodiles, and huge lizards. Its richness in fish and insects is beyond the power of description. Yet strange to say, with all its broad grassy pampas it had no native cattle, horses, sheep, goats, or antelopes.

*Characteristic African Animals.*—The few examples we have give but little idea of the richness of this province. Two-thirds of its mammals and three-fifths of its birds do not occur elsewhere. The lofty giraffe, the hyena, and some other forms are represented in the osteological series. The zebra is one of the interesting types from Africa, and of the eighty or more antelopes we have the koodoo and gemsbok, that so often figure in the hunters' tales. Here lives the elephant, the African rhinoceros, the hippopotamus—the largest of land animals—lions, leopards, and jackals, but we note the lack of tigers, wolves, foxes, bears, wild oxen, deer, sheep, goats, camels, moles, and true pigs, all of which occur in the adjacent regions. Among the birds shown the most interesting perhaps is the snake-eating secretary bird.

Madagascar is sometimes classed as a separate realm, called the Lemurian realm, because of many species



of lemur there and especially one unspecialized or primitive type. Some of the islands of this neighborhood have seen a number of old fashioned birds become extinct within the last few centuries.

*Characteristic Oriental Animals.*—Of the many large forms to be found in the Oriental region, including the elephant, tiger, lion, etc., there are shown the Indian rhinoceros and Malay tapir. That the so-called horn of the former is structurally simply a compact mass of hairs does not seem to be generally known. With it he roots up trees. It is from the jungle fowl of this region that our common domestic fowl comes, as well as our peacock and the fancy pheasants. The region abounds in beautiful birds and butterflies.

*Characteristic Eurasian Animals.*—Notwithstanding the enormous land area included in this realm, the majority of its plants and animals are identical throughout. Not only that, but there is so great similarity between the fauna of this region and the North American realm that they are often united into one. Though this region has few peculiar forms at present, in comparatively recent geological times it was the home of many of the huge animals or their ancestors, that characterize the African and Oriental realms. The camels, of which one is shown, belong

to this realm. The chamois is one of the typical species. The great bustard shown is said to be the largest bird of Europe. The hedgehog, one of the typical forms of this area, has been put in the self-defence case.

The North American forms have already been studied.

The three wall cases on the north side of the room illustrate the morphology of the teeth and skin and adaptations to various modes of locomotion.

*Teeth.*—The case at the right contains various types of teeth. Compare the skull of the lion with one of the herb eaters. The first, a carnivorous animal, has inconspicuous incisors, but large prominent canines for holding and tearing his prey. Then come the molars with irregular, narrow, and sharp edges that pass each other like the blades of scissors. Turning to the herb eater we find the incisors prominent, with sharp cutting edge, and frequently the upper set wanting, as in the cow and sheep. (See the next case.) The canines are wanting or small. The molars are numerous and with the tops flat but ridged like a grindstone for grinding up the vegetable matter. A moment's reflection will show that man's teeth are intermediate in type, a fact that is usually advanced in favor of the argument that he is by nature adapted for a mixed diet.

Teeth first appear in sea-urchins, forming what is called Aristotle's lantern. The univalve shells carry their teeth on their tongue.

Many of the fish have teeth all over their mouths. The rays have the roof of the mouth paved with a sort of cobblestone-like teeth for crushing shells. Many forms have no teeth, as the sturgeon among fishes. None of the amphibia except the frogs have teeth. The ant-eater and related forms among the mammals have no teeth. The elephant tusk shown is an upper incisor; he has no lower. The tusk of the walrus is a canine. The teeth of the horse, both ancient and modern, of the mylodon, the saw-fish, mastodon, mammoth, and many others will be noted.

*Adaptations for Locomotion.*—First come the fixed forms, such as the barnacle and oyster, practically all of which swim freely when young. Then come the swimming forms, from the minute forms that swim by the rapid motion of cilia to the swimming vertebrates, the fishes with the different types of tail, the turtle with his broad fins, the webbed footed birds, mammals like the otter, and the more fish-like mammals, such as the porpoise, etc. Then come the digging forms that live in the ground, like the mole, with its broad forepaws. Then come the creeping forms, the gasteropod, snake, caterpillar, thousand-legged worm, earthworm, etc. The running forms include animals

from the ungainly turtle and alligator to the quick-footed lizard among reptiles. The running birds have powerful legs, and wings too short for flight; even the ground birds have comparatively small wings and feet adapted for the ground. They walk or run, in contrast with the perching birds that hop along on the ground. The mammals vary in running ability up to or beyond the deer shown. Notice that, as shown, the swift forms run on the toes, while others, like the bear, put the whole foot down. The leaping forms from the grasshopper to the kangaroo agree in the unusual development of the hind legs. In the climbing forms that follow, the adaptation is most noticeable in the character of the hand or foot, as in the sloth; the woodpecker has two toes pointed forward and two pointed backward, to give him a hold. The monkey can not only grasp with his hands and feet but with his tail as well. The cat and squirrel have the claws adapted for clinging to the rough bark of trees. Lastly come the flying forms, of which the buzzard with its long wings and its power of sustained flight is one of the best examples. Notice the adaptations of animals of other classes, all agreeing in having the bones very light, usually hollow. The flying birds have the keeled breast-bone for the attachment of the powerful muscles needed for flight. The bat spreads a skin between his fingers, a method

followed by an ancient group of reptiles that used to fly. The flying forms among the invertebrates are also illustrated. There are also shown the forms that, like the flying squirrel and flying-fish, are enabled to take advantage of the inertia of the air to take short flights.

In the back of this case are shown two groups. At the right are nearly all the common domestic animals, as they look in their bones, from the horse to the cat. At the left are a few skeletons of nearly extinct animals, such as the buffalo and wild turkey.

*Modifications of Skin.*—The next case illustrates some of the modifications of skin. It should be recalled that the teeth shown in the last case but one are modifications of the skin. Here are shown, besides some interesting examples of simple skin, such as that of the elephant and the whale, the latter full of boring shells, the exoskeleton of sponge, star-fish, sea-urchin, crab, insects, shells, etc. Then come such modifications as the hair of mammals, the feathers of birds, the scales of fish and reptiles, the nails, hoofs, claws, and horns of mammals. The bony scales of the alligator, the carapace of turtles, the rattle of the rattlesnake, the beaks of birds and turtles, the quills of the porcupine, etc.

Returning past the west side of the central case, we find several additional illustrations of adap-

tations of animals for obtaining food. Of most interest here is the giraffe, whose long neck is thought to have developed through his reaching for the uppermost twigs of an umbrella-like tree that mainly forms his food, by the gradual starving out of the short-necked ones during seasons of drought, and the tendency of the longer necked survivors to have long-necked young. The great ant-eater, that because of the character of his food gets along without teeth is another interesting form. He uses his long sticky tongue to get the ants out with and breaks them up against some ridges in the roof of his mouth. Notice how his fore feet are adapted for digging up the ants.

*Rare Birds.*—A few of the rare birds of North America are shown in the small case at the right in leaving this room. The snowy egret has been sacrificed at the altar of fashion and has now almost disappeared. The ivory-billed woodpecker has always been a rare bird. The wild pigeon as late as 1878 flew in flocks that darkened the sky for miles in sections of the country that to-day have not seen one for years. Through the slaughter of millions every year the wild pigeon has become only a memory.

## HALL OF GEOLOGY

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At present this room contains a case each of birds, fossils, and plants, and two cases each of fish, reptiles, crustaceans, etc., and minerals, with some mammals, skeletons, etc. Temporarily at least, it is planned to keep the fish and reptiles in this room, to occupy the cases on the east and north side. The rest of the cases it is planned to devote to geology. As previously stated, this plan does not give case room for all the geological material already on hand, much of which is stored in other parts of the College building. The present plans contemplate the preparation and exhibition of a few picked specimens to illustrate the character of the series, to be shown later when the funds will allow of completing the cases in the gallery. The following series are projected :

Descriptive mineralogy. This will illustrate the different physical and chemical properties of minerals, such as the modes of crystalization, color, cleavage, etc. ; and the different groups according to their chemical composition, the last to be in two series: one of these, illustrated by the case containing minerals with phosphorus, is to show the minerals containing the common metals or other elements of value, as iron,

zinc, lead, etc., to serve as a theoretical basis for the study of the ores; the other series is to follow the usual method of classification according to the acidic element contained.

Series illustrating the occurrence and formation of minerals.

Series illustrating the formation rocks.

Classification series of rocks.

Series showing by models the form of the earth, etc., including relief maps of the types of topography, and series illustrating the derivation and development of those forms.

Series illustrating, by means of charts, models, photographs, etc., the way the rocks lie in the earth; in brief, illustrating what is commonly called structural Geology.

Charts showing the distribution of the land and water surfaces of the earth at different geological periods.

A series of rocks illustrating the typical character of described rocks at type localities.

Upright cases containing samples of the borings made at Charleston, so arranged as to show at a glance the depth of any sample and the geological formation to which it belongs.

A series showing the types of fossils characteristic of the different geological ages, periods, etc.



Special and as complete series as possible of the local fossils.

A series showing the different ores from which each of the metals are obtained, accompanied by maps and other graphic representations to show the proportion of the metal in each ore, the localities at which each of the ores is mined, etc.

Series illustrating the various steps in the mining and metallurgy of the different metals, with specimens, as far as possible, illustrating the appearance of the ore at different stages, the other materials used in the process, and the by-products and waste, and with charts and photographs exhibiting the remaining phases of the process.

Similar series for building stones and fuels.

A collection of gems, showing the gem in the rough and when cut, and also the appearance of the same mineral in its more massive form; models of the crystalline form, etc.

It is hoped that the second edition of this Guide will be more than a prospectus for this department.

## MANIGAULT HALL

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The wing in which this hall is situated was destroyed by the earthquake of 1886. When rebuilt it was under the personal supervision of Dr. Manigault, and this floor was designed specifically for museum purposes. The difference in the results is too marked to need comment. The new hall was devoted to man and his works, and a beginning was made toward a collection of objects of archæology and art. Here also a beginning was made by the former Curator in the system of descriptive labels and illustration, which will be continued by the present Curator. The presence of such labels here will lessen the need of the Guide in this department, though here, as much or more than in the other departments, the material by its suggestiveness could be made the subject of volumes of description and history.

At the left of the door hangs a portrait of Dr. Manigault, after whom the hall is named. Then come cases showing the prehistorical archæology of South Carolina and America, and material illustrating the ethnology of races. At present this material lacks arrangement; its description will therefore be deferred to later editions of the Guide.

Along the west and north walls of this room are examples of bas-reliefs found in the ruins of the cities of Assyria. The striking, human-headed, winged bulls and lions with their supernumerary legs are found at the portals of the palaces. The other pieces in low relief shown on the walls are typical of the carved slabs of alabaster or limestone found forming a wainscoting some eight feet high around the brick walls of the buildings.

The next object of interest is the copy of the famous Rosetta stone. It was discovered in 1799 by Napoleon's officers during the French occupation of Egypt in an excavation made at Fort St. Julian, near Rosetta. It dates from 195 B. C. Its interest lies in the fact that it contained a decree in the Greek, the demotic, and the hieroglyphics, which ultimately, through the labors of Champollion and others, led to the deciphering of the early history of Egypt as contained in the hieroglyphics. The casts of early Egyptian rulers give a good idea of early Egyptian art and of the ethnological features of the race at that time. The case at the end contains a mummy and mummy cases. On the right are reproductions of ancient Greek vases that will especially interest artists and lovers of the ceramic art. They are from the celebrated terra-cotta factory of Copenhagen. Then come casts from the originals in Yucatan of the

remains of the decoration of an ancient Mexican temple.

Around the walls, in addition to the pieces of general statuary, all belonging to the recent past and present centuries, are twenty well made busts from Paris representing some of the distinguished characters of Roman and French history, and near them are casts of five South Carolina worthies who figure in American history—Calhoun, McDuffie, the two generals Pinckney, and Col. Francis K. Huger, who attempted the rescue of Lafayette, when imprisoned in the Austrian fortress of Olmütz.

## THE GALLERIES

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Returning through the Hall of Geology, there will be noted a fine example of the moose and a skeleton of the same. It is hoped ultimately to move this mount to the main floor of Holmes Hall.

*The Whale.*—The object of most interest in the gallery of Agassiz Hall is the skeleton of the Greenland whale. This whale wandered into Charleston harbor January 7, 1880, and led to a whale hunt under most unusual circumstances. The hunt lasted nearly all day, being joined in by all sorts of craft, even the harbor tugs lending a hand, and the ferries going out of their way to give their passengers a view of the struggle. The blowing of the factory whistles toward evening announced the death of the whale. It was then towed over to Sullivan's Island where the remains were visited by thousands. The total length in the flesh was 41 feet and 6 inches. It was said by those who knew to have been a young whale. The mounting is by Dr. Manigault.

The upper part of the case in the center of the hall contains skeletons of the sea-going mammals, including the dugong, seals, etc.

In the north gallery are skeletons of the single and double humped camels, of the mule, deer, etc. In the south gallery are the priceless Elliott herbarium and many other valuable herbariums, and much other matter placed there pending its further arrangement. It is hoped in the near future to have new dust and insect proof cases made for the herbariums and the other specimens of type and figured specimens in which the museum is exceedingly rich.

The gallery in the Hall of Invertebrates at present contains only some odd specimens stored in the large case from which the bison group has just been removed.

*Gallery of Holmes Hall.*—This gallery contains at present, at the south end, the Biltmore herbarium and the nucleus of the economic collection in botany, and, at the north end, the series of large skeletons which will be used to show the homologies of the principal bones.

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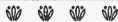
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