

NEW EXHIBIT PROVIDES A KEY TO ANIMAL KINGDOM

BY AUSTIN L. RAND
CHIEF CURATOR OF ZOOLOGY

A NEW EXHIBIT, "The Animal Kingdom," gives a bird's-eye view of what animals are like. Here the Museum visitor can see each group against a background of its relatives and get an outline of the whole animal kingdom. This display is located at the north end of George M. Pullman Hall (Hall 13) where most visitors begin their tours of zoology exhibits.

Not even a professional biologist can hope to know all of the million or so species of animals. To stress how vast the number of species is, we point out that a zoologist looking at them one species a minute would require 20 years of Museum working-time to check them all. If he made a list of them, typed 25 to the page, the stack of manuscript pages would be 10 feet high.

Despite the fact that we as human beings are animals—members of the animal kingdom and hence related to the other million

or so known kinds of animals—our knowledge of these relatives of ours is scanty and erratic. Many of us have spent time and effort to find out about and even to visit our immediate relatives and to trace our ancestors. But I imagine few people have given much thought to the range and variety of the living animals that comprise our more distant relatives, not to speak of those that lived in the remote past and have left a record of fossils in the rock, a record that can be traced with some assurance back a half-billion years to the Cambrian period of the earth's history.

OUR COUSIN, THE AMOEBA

The single-celled amoeba of a pond, the horsehair worm of a rainbarrel, the tiny copepods of the ocean plankton, and the sea urchin of shallow seas may not seem very important, but measured as examples of the manifold forms into which animal life has been stamped, of the diversity of organi-

zation that has occurred in animal life, and the ramifications of the animal life of which we are a part, they assume a very real importance as our distant relatives. The discovery of the appearance and of the way of life of these our relatives can be among the adventures of everyday life.

As Museum visitors stand in front of our exhibit "The Animal Kingdom" and see examples of the eight major types of animals, we hope they will be impressed enough by this outline of what the living world holds to spur them to want to find out more about these, our relatives—what they are and their way of life.

While the multiplicity of kinds of animals precludes any one person from knowing them all, many of the species differ only in detail. There are groups of similar species that we put together under generic names, genera that we group into families, families into orders, orders into classes, and classes into phyla. These groupings not only indicate relationships but are also an aid to memory.

EIGHT MAJOR TYPES

A knowledge of animals should include at least an acquaintance with the main types of animals. There are eight of these major types of animal organization, or structure, that are prominent parts of the animal life of the globe. In our new exhibit, examples of each are presented in eight cases placed side by side in an alcove so that a visitor, standing in one place, can see what these eight types look like.

These main types are:

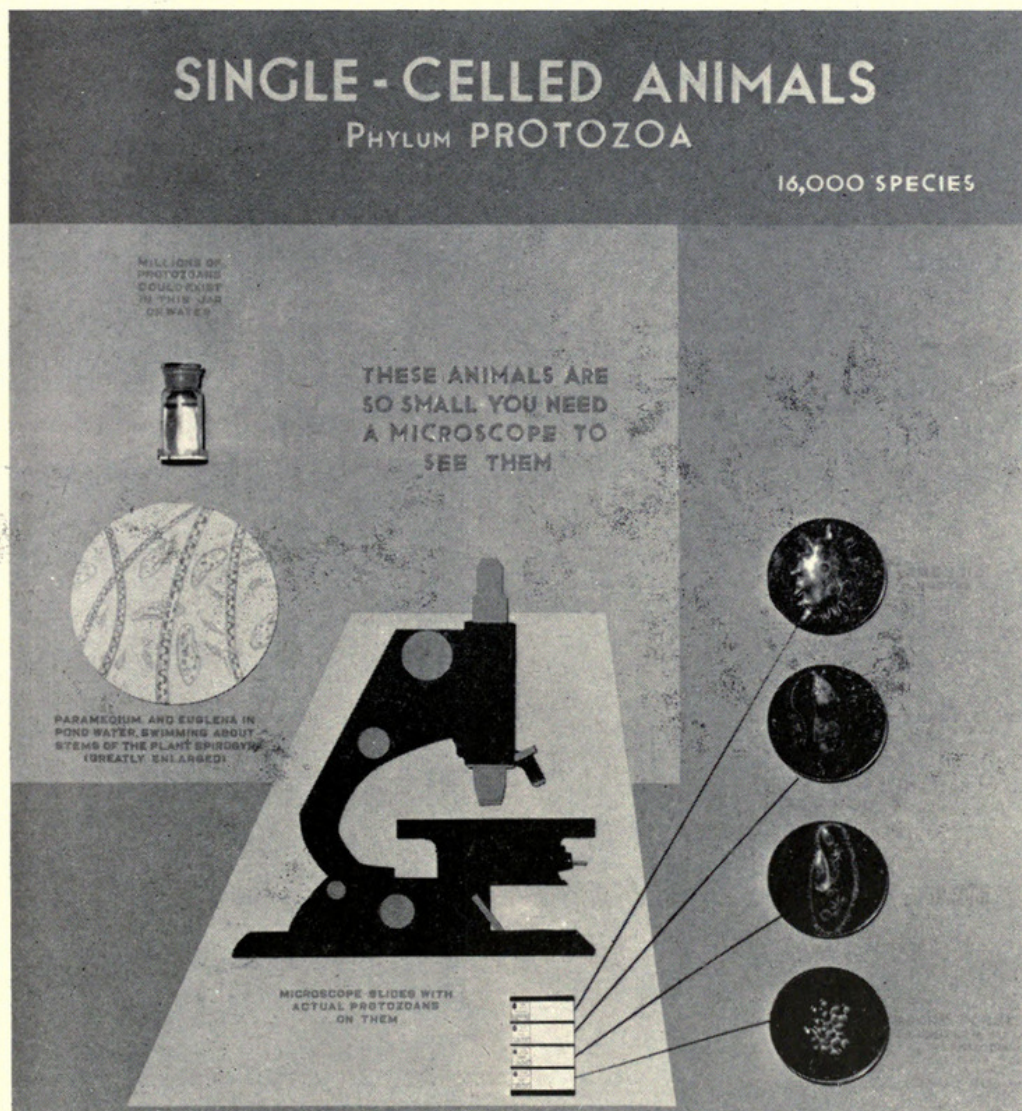
1. Single-celled animals, or protozoans, of which the microscopic amoeba and paramecium of elementary biology classes are examples.

2. Sponges—many-celled animals of simple organization. The common bath sponge is the best-known example of these (the sponge of commerce is only the skeleton of the animal from which the fleshy parts have been cleaned).

3. Jellyfish, corals, and the like, grouped under the name coelenterates—with a sac-like digestive system, a radial symmetry (like that of a wheel), and stinging cells—stand near the basic stem to which the higher phyla seem related.

4. Worm-like animals. This is a heterogeneous grouping, for inside the worm-like form of such types as flat worms, round worms, and earthworms is considerable difference in structure—they have bilateral symmetry (a left and right side), and their organ systems are better developed than in the previous groups. In earthworms, segmentation is introduced (shown by the rings of an earthworm). Various minor groups, such as ribbon worms, horsehair

(Continued on page 7, column 1)



THE PROTOZOANS—FIRST OF THE ANIMAL KINGDOM EXHIBITS

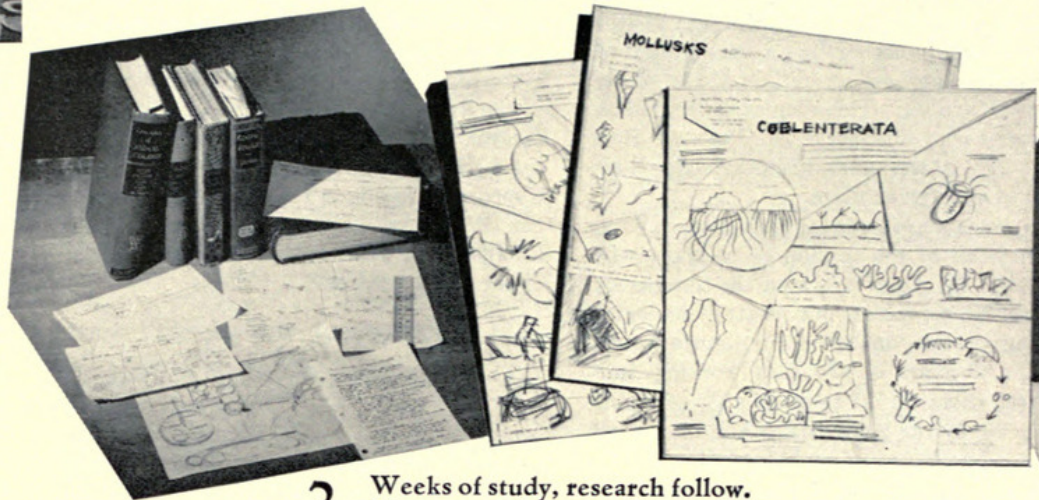
These are the simplest animal forms. In the Museum display they are represented, greatly enlarged, by reverse carvings. Actual specimens can be seen only with a microscope. Millions could exist in jar of water.



1. Plans are outlined by Chief Curator Rand and Staff Artist Pfiffner (left).

Into the preparation of a new exhibit, such as "The A go many weeks of planning, research and creative effort the picture-story from inception to completion of th

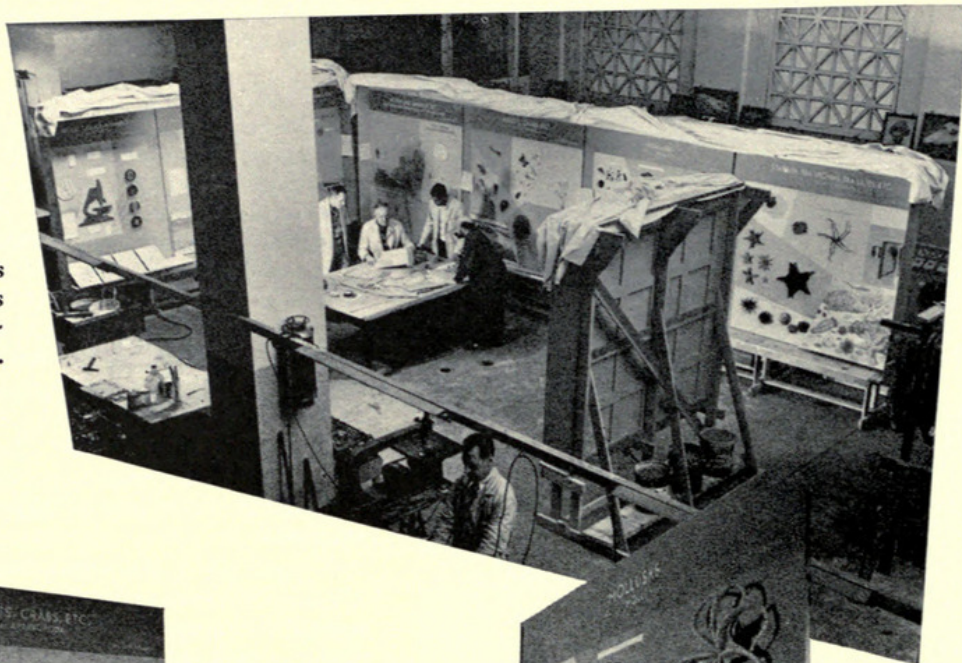
AN EXHIBIT



2. Weeks of study, research follow. Notes are taken, sketches made.

3. Ne of

7. Taxidermists and artists meet to integrate efforts.



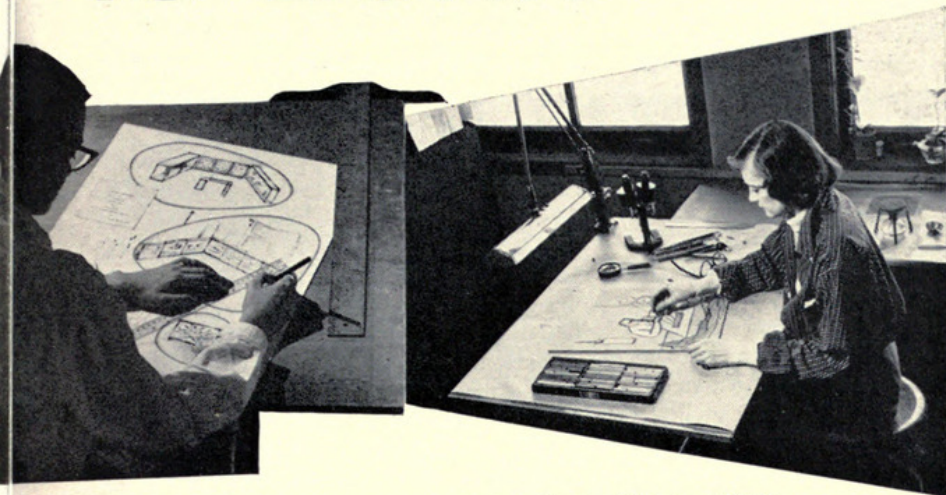
8. Artist Krstolich installs king crab—carves jellyfish cycle in plastic—places small octopus on screen.



9. Taxidermists Lambert (left) and Cotton p specimens for case of backboned animals.

"Animal Kingdom" which will be opened in September, at the part of staff members of varied talents. Here is the new exhibit in George M. Pullman Hall (Hall 13).

IS BORN



drawings are made of the new cases.

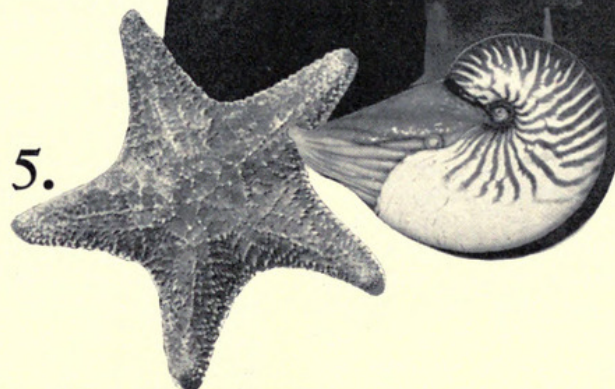
4. Artist Marion Pahl begins color layout.



6. Artist Pfiffner works on one of eight paintings in exhibit.



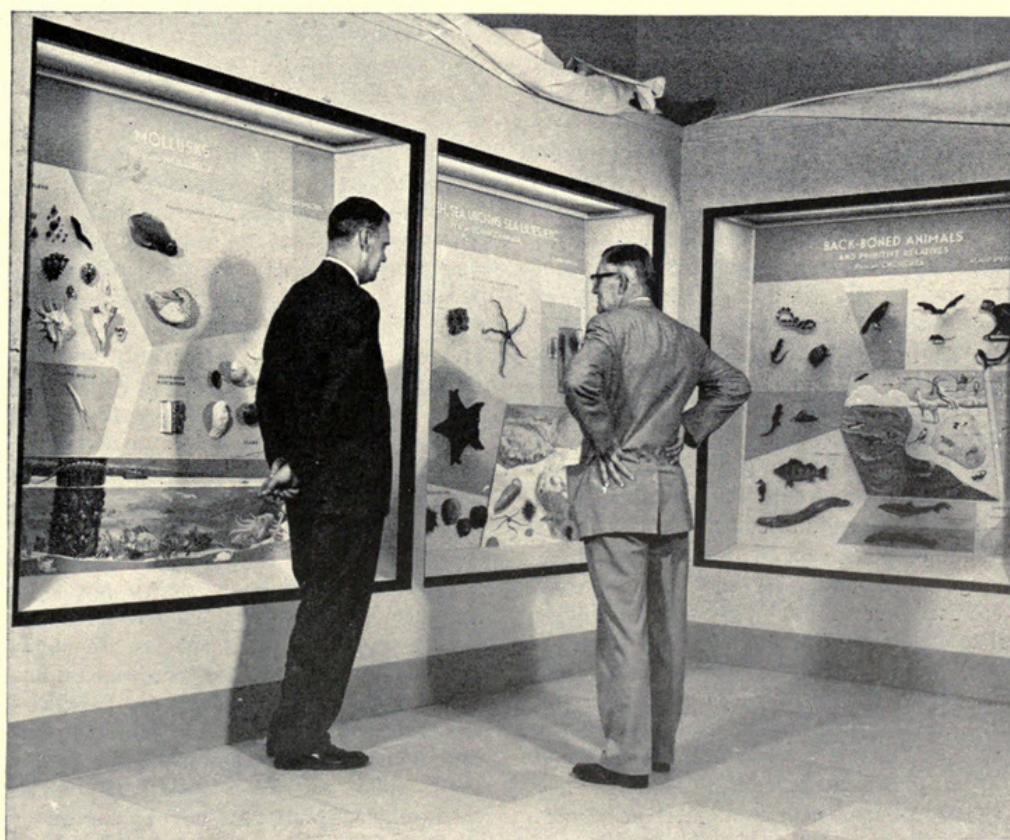
Dr. Haas (left) and Dr. Rand select the specimens.



5.



10. Cases are installed, readied for the public.



11. Complete except for labels, "The Animal Kingdom" is appraised by Dr. Rand and John R. Millar, Deputy Director of the Museum.

THE STORY BEHIND A MAJOR MUSEUM PROJECT

By AUSTIN L. RAND
CHIEF CURATOR OF ZOOLOGY

WHEN WE PLANNED the synoptic exhibit of the animal kingdom one of the first questions was how big to make it. Obviously we couldn't use many whales, cuttlefish, elephants, or giant clams. But we could use small examples instead of large ones of each of the eight major types of animals. Finally we planned an exhibit that could be seen in its entirety in one place. After all, we have whole halls devoted to only parts of one group, for example five halls for mammals, which are merely one subgroup of the vertebrates. Vertebrates themselves have only about 46,000 species (contrasted with the million or so animals there are). For further information about each group we refer the visitor to the appropriate hall.

For the new exhibit we use eight cases, side by side, one for each of the major types of animals, and use small examples of each group shown. A mouse, a thrush, a perch, and a lamprey represent the vertebrates just as truly as would an elephant, a condor, a sturgeon, and a manta ray.

We want the Museum visitor, on first sight of the exhibit, to say "How attractive! How interesting looking! I wonder what it shows!" even before he becomes aware of the entrancing story the exhibit tells. A conference of Museum artists came up with background designs, dividing the cases into panels for each subgroup to be shown, and pastel shades of brown and tan were chosen to paint the panels.

PAINTINGS ADD INTEREST

We realized early that the actual specimens we could exhibit needed additional illustrative material to show where and how the animals lived and their importance on our globe—something that would put across the beauty, the prominence, and the interest to us of these animals. A painting seemed the answer, and in each case we put at least one such panel. In subject the paintings range widely: for instance one is a robin pulling up a worm on a lawn, another an enlargement of protozoans in a drop of water, and another a view of corals on the Australian Great Barrier Reef. As well as supplementing the more prosaic specimens, the pictures are attractive in themselves, adding brightness and color.

Some of the specimens were easy. Dried sponges and corals (of the coelenterates) were used, even though they were only poor dried skeletons. Insects and crabs (arthropods) with their hard exoskeletons were fairly easy, though the legs of spiders and centipedes presented special difficulties. Snails and clams (mollusks) are represented chiefly by their shells, and echinoderms have a skeleton that is near enough to the surface to hold the shape when dry.

Most of the vertebrates require special preparation. We have one taxidermist whose specialty is making lifelike mounts of birds and mammals, and another who specializes in plastic replicas of reptiles, amphibians, and fishes that compare well with their living prototypes.

OBSTACLES ARE OVERCOME

Then came the difficulties: soft-bodied worms, jellyfish that were mostly water, transparent crustaceans such as copepods. Fortunately we had some glass models, made long ago, of jellyfish, sea anemones, and Portuguese man-o'-war. These models would be hard to duplicate at the present time. The complexity and the transparency of these animals, and the long delicate tentacles are extremely difficult to show in any preparations, but the models we have are fine examples of the glassblower's skill. A few other models were made, such as that of the octopus modeled in wax with arms stiffened with wire.

However we used models as sparingly as possible. We wanted to show the real specimens whenever possible. Conferring with Turtox (General Biological Supply House) personnel we found that a number of soft-bodied animals could be displayed by first embedding them in a clear plastic. Some lower chordates, some crustaceans such as fairy shrimp, and a number of worms were prepared by Turtox in plastic blocks of appropriate sizes and show the animals very well. Even a dried sea-lily (crinoid) was improved in appearance by being embedded in a block of clear plastic.

Yet another technique was used in presenting an outline of the life history of a jellyfish. The animals are delicate and transparent at every stage, and a reverse carving was the answer. The animals were engraved on the back of a sheet of clear plastic, a small grinding-tool being used. When viewed from the front against a dark background, it is like looking at real animals floating in water. A similar technique gave very effective representations of copepods and an arrow worm. Not only are these transparent animals better represented than they would be by models, but the reverse carving is a much quicker process and it gives a "specimen" that is much more durable than a model would be.

MICROSCOPIC SPECIES ENLARGED

Most of the animals shown are actual animals and most of the models are natural size, even when small species are shown. But when we came to the protozoans we had to show enlargements. We put samples of the real protozoans in the exhibit, mounted on microscope slides, but you can't even see them under the cover glass. So we also made enlargements by the reverse-carving method. To give the proper depth in the

carving, some details were carved on a second sheet of plastic and placed back of the first. These carvings are displayed on dark backing. From the front the appearance of depth is very real. To emphasize the fact that these are enlargements we placed a cutout of a microscope in the middle of the exhibit showing the protozoans. This points up the fact that protozoans are microscopic and that when you look at them you must use a microscope.

This is some of the background of "The Animal Kingdom." There is more that hasn't been touched on: the study collections gathered over the years on which we could draw for specimens, the books and the research that went into the form of the presentation, the long periods of application of rare skills of several persons to put the material together. The preparations required more than a year of work. Now, standing in front of the exhibit, you can see at a glance a synopsis of the types of animals that exist.

The exhibit was planned in the Department of Zoology. Joseph B. Krstolich, departmental Artist, devoted his time to it for over a year. E. John Piffner, Staff Artist, did the basic design of the exhibit unit and also the paintings and diagrams, with assistance by Miss Marion Pahl, Staff Illustrator. Carl W. Cotton, Taxidermist, prepared the birds and mammals, and Ronald Lambert, Taxidermist, did the reptiles, amphibians, and fishes. General Biological Supply House (Turtox), of Chicago, co-operated with the Museum in preparing and supplying material embedded in plastic.

CURATOR TO COLLECT CARIBBEAN FISHES

As on several occasions in past years, the Museum will participate in a fishing expedition of the United States Fish and Wildlife Service. By invitation, Loren P. Woods, Curator of Fishes, sailed August 13 from Pascagoula, Mississippi, aboard the government service's motor vessel *Oregon* for a cruise of about forty days offshore, outside the international 12-mile limit. Trawling and long-line fishing along the entire coast of Central America from Yucatan to Panama will occupy the ship's regular crew and Curator Woods.

While the ship's personnel is engaged in investigating problems relating to commercial fisheries, Woods hopes to obtain thousands of specimens for study and for exhibition at the Museum. Woods will return to Chicago with his collections late in September, with barely enough time to sort his specimens into jars of alcohol before he departs again on the *Oregon* in November for a similar 40-day expedition farther south along the Atlantic coast of the Guianas and Brazil.

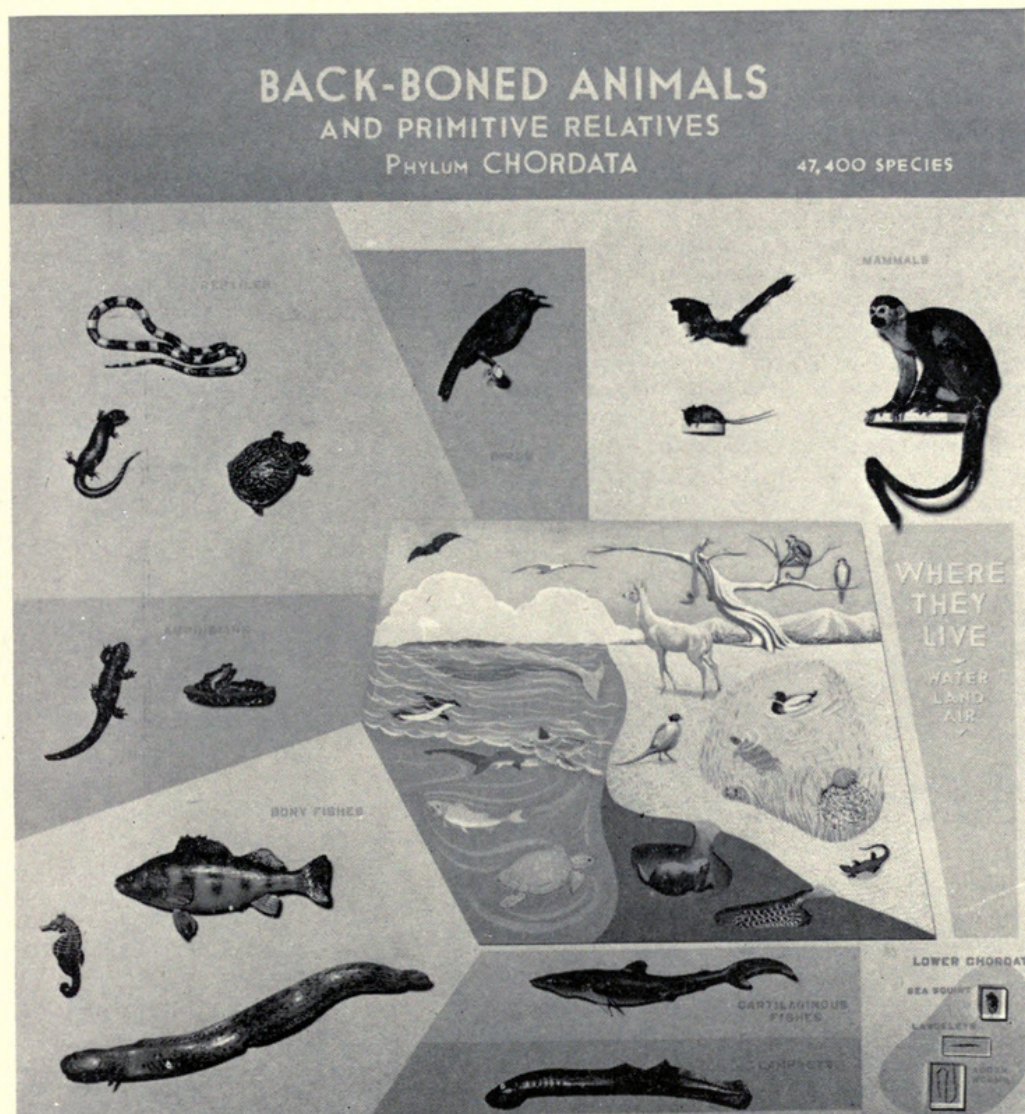
KEY TO THE ANIMAL KINGDOM IN NEW EXHIBIT

(Continued from page 3)

worms, spiny-headed worms, arrow worms, lamp shells, and moss animals, are briefly introduced here.

5. Arthropods. The best known in this phylum are the insects, the spiders, and the

mollusks, echinoderms, and vertebrates—are all very advanced phyla characterized by highly organized animals, each group specializing in a different way. The single-celled animals and the related phylum sponges are the simplest. The basic struc-



THE BACKBONED ANIMALS

This group embraces the most highly evolved animals. They live in water, on land, and in the air. They include, in addition to the familiar vertebrates, the little-known lower chordates. The exhibit is the last in the series of eight summarizing the Animal Kingdom.

crayfish and lobsters. Jointed legs, an exoskeleton, and an elaborated segmentation characterize this highly evolved group.

6. Mollusks. The clams with a shell in two parts, the snails with one-piece shell, and the squids and cuttlefish with no obvious shell are the best-known types.

7. Echinoderms. The sea urchins, starfish, and sea lilies are characteristic of this phylum, which has a radial symmetry (like that of a wheel).

8. Vertebrates. From fish to man these are the familiar larger animals. The backbone, bilateral symmetry, and the presence of two pairs of limbs (usually) are typical.

The last four of these—the arthropods,

ture which could have given rise to the higher vertebrates is seen in the coelenterates.

This exhibit, "The Animal Kingdom," also serves as an index to the zoology exhibits in the Museum. Under each group we indicate the halls in which animals of each type can be found.

Some of the most ancient examples of cultivated grains—ancient barley and wheat from Mesopotamia, of wheat from the pyramids of Egypt, and corn from the pre-Colombian Indian sites in North and South America—are exhibited in the Hall of Food Plants (Hall 25).

'JOURNEY' FOR CHILDREN TO INDIAN COUNTRY

The Museum Journey for boys and girls this autumn is "Exploring Indian Country." It will be available to any child at any time on every day in October and November. Children who wish to participate should ask for Journey sheets at either the North or South entrance of the Museum. These instructions direct the "travelers" to the Indian exhibits in Hall 5 (Mary D. Sturges Hall) and Hall 6, where they will find material to stir their imaginations for travel by canoe, snowshoes, and horseback and for living as the Indians did 150 years ago in the Chicago area and in the West.

During the Journey the child fills in questions on his Journey sheet and deposits it in a box at either Museum door when he leaves the building. When the child has successfully completed four Journeys he receives an award as a Museum Traveler. After eight Journeys he becomes a Museum Adventurer and after twelve a Museum Explorer.

The fall Journey is correlated with the season's series of Museum Stories, "Indian Neighbors of Our United States Settlers," which was written by Miss Harriet Smith of the Raymond Foundation staff, who also arranged the Journey. One story in this series will be given to each boy and girl at each Saturday-morning movie in the Museum's James Simpson Theatre during October and November. All nine stories will be available as a set after November 30 at the Museum Book Shop.

NEW MEMBERS

The following new Members were elected in the period from July 15 to August 15:

Sustaining Members

Mrs. Stanton Armour, Sr., Paul J. Basinger

Annual Members

Charles G. Ashbrook, Mrs. Harry Bairstow, Jr., Milton B. Beach, George H. Bunge, Anson W. Cameron, Jack Carl, David R. Coey, James R. Cruttenden, William H. Depperman, Charles Dunlop, Theodore T. Eckert, Howard F. Erzinger, Stephen D. Faber, Harry L. Gadau, Stanley H. Garrod, S. F. Greenlaw, Edward E. Hallihan, Burton W. Hales, Jr., Thomas A. Harwood, Leonard H. Hirsch, Harry Holubow, William R. Hunt, Sidney Hutchings, M. H. Joffe, Dr. Charles H. Kettelman, Ben D. Kissel, William G. Knapp, Dr. John R. Laadt, Raymond P. Lowrie, F. C. MacKrell, Cleo Edwin McPherson, L. E. Meyer, S. E. Meyers, William B. Miller, Jr., Howard C. Morton, Arthur K. Oldin, Charles R. Perrigo, Dr. David T. Petty, Jonathan Pugh, Carl Renner, C. Snelling Robinson, Joseph A. Saccone, Jr., Archie M. Schrom, Ben E. Schwartz, Frederick H. Sommer, Dr. Natalie Stephens, Robert D. Stuart, Jr., Dr. Ernest H. Wakefield



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