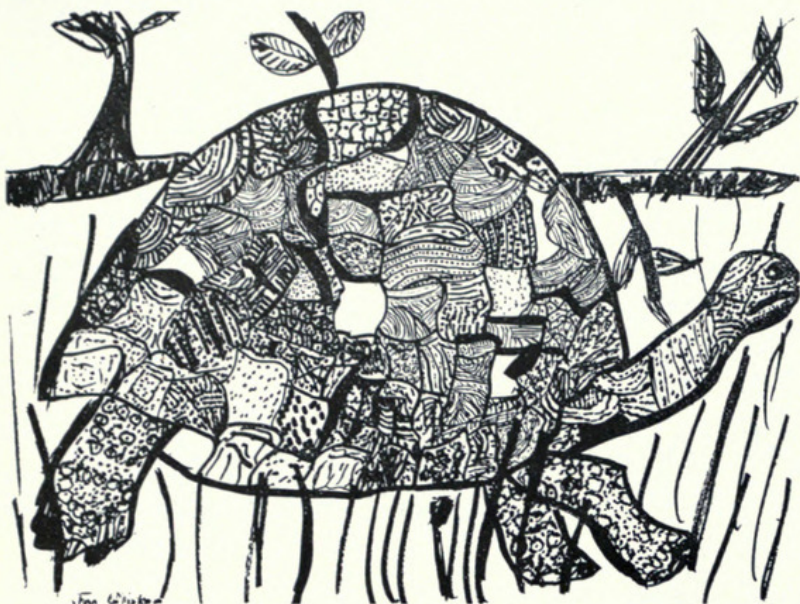




Museum exhibits of every variety—from turtles to South Sea masks—are reflected in an exhibition of student art opening May 18.

Student Art Exhibit

THE CHALK drawing reproduced on this month's cover is from the Museum's annual spring exhibition of art by students in the Junior School of the Art Institute of Chicago.

Created by young artists aged 5 to 18, the more than 50 paintings and drawings on display were stimulated and inspired by Museum exhibits. A variety of techniques, including collage, scratch-board, and various paint media, are employed in the spirited and imaginative exhibition. It can be seen from May 18 through June 9 in Hall 9, on the Museum's first floor.

Science Fair

HUNDREDS of top science projects designed by students of the Chicago area will be on exhibit in Stanley Field Hall on Saturday, May 23, from 9 A.M. until 5 P.M., in the 16th Annual Chicago Area Science Fair.

An outstanding demonstration of student comprehension and application of scientific principles, the Fair brings together projects carried out by sixth graders through high school seniors in the public, private, and parochial



schools within a 35-mile radius of Chicago. The exhibits have been chosen for display in the Museum through preliminary competitions held in each school. The Fair is sponsored by the Chicago Area Teachers Science Association.

Library Honored

CHICAGO Natural History Museum Library has been designated a United States Government Depository Library to receive publications under the se-

lective plan of distribution. This means that the Museum Library will now enjoy the privilege of receiving, free of charge, many publications in fields related to the Museum's programs of research which are published by agencies of the Federal Government. Among these agencies are the United States National Museum, the Smithsonian Institution, the Library of Congress, the Department of Agriculture, the Department of the Interior, the National Science Foundation, and the National Research Council.

Staff Notes

THE ASOCIACION Ornitológica Del Plata in Buenos Aires has recently honored two Museum ornithologists. Dr. Austin L. Rand, Chief Curator of Zoology has been elected a Corresponding Member of the Association, whose publication is *El Hornero*. Mr. Emmet R. Blake, Curator of Birds, was elected an Honorary Member in recognition of his "valuable contributions to the knowledge of neotropical birds."

Mr. Blake has also been appointed to the Committee on Classification and Nomenclature of the American Ornithologists' Union. This committee will be responsible for preparing the sixth edition of the official *Check-List of North American Birds*, which will be expanded to include Mexico. The volume is scheduled for publication in 1972.

Marion G. Grey

1911 - 1964

THE MUSEUM records with deep regret the death on March 20, 1964, of Mrs. Marion G. Grey (Mrs. Arthur L. Grey), Associate in the Division of Fishes. She was 52 years of age. Mrs. Grey became associated with the Museum as a volunteer with an interest in marine invertebrates. During World War II when the Curator of Fishes was serving in the Navy, Mrs. Grey kept the Division operating and was elected an Associate in 1943.

Her interest in marine biology began
(Continued on page 8)



Drawing by Marion Pahl

THE FIRST ship of record to sail on Lake Michigan was La Salle's trading vessel, the *Griffin*. In August of 1679 this vessel sailed from the east end of Lake Erie to St. Ignace on the north-west side of Lake Huron and then across northern Lake Michigan to one of the islands lying at the opening into Green Bay. In September of 1679 the *Griffin* sailed from the Green Bay island and disappeared, never again to be seen by her French owners.

The *Griffin* usually is depicted as a large three-masted ship, the typical man-of-war and freighter of the seventeenth

century. On the Franquelin map of 1688, such a ship shown in Lake Michigan and also in Lake Huron is probably meant to represent the *Griffin*. Many museum exhibits and many book illustrations also portray the *Griffin* as a large seventeenth century freighter with three masts and elaborate rigging. I intend to show that La Salle's vessel was a much more modest boat and not at all like the magnificent freighters or men-of-war that usually have been the bases for pictorial reconstructions of the *Griffin*.

Father Louis Hennepin, a Récollet

missionary, witnessed the building of the *Griffin* and was a passenger on the vessel during her voyage. He kept a journal and his written statements are the primary historical source of information about the ship and its voyage. However, Hennepin's account is so incomplete that one does not know what kind of vessel the *Griffin* was or where she actually went in Lake Michigan. I propose to remedy this lack by making an historical reconstruction of the ship and her voyage.¹

(Continued on next page)

The Building of the *Griffin*

THE SHIP was built in the late winter and spring of 1679 above Niagara Falls, probably at the mouth of Cayuga Creek. A master carpenter, a blacksmith, and fewer than ten other carpenters and workmen built and launched the *Griffin* in the period between January 22 and May 27, 1679. When one considers that the wood came from trees felled nearby and that all of the ship's timbers and planking had to be cut and shaped *in situ*, then fitted into place and fastened, it does not seem possible that so few men could have built a ship of any great size in a period of approximately four months.

SIZE

ALTHOUGH there are no direct statements concerning the dimensions of the vessel there are statements of her burden or cargo capacity. Hennepin says the *Griffin* "was but 60 Tuns" burden. In earlier editions of his work he said the ship was about 45 tons burden. It is thus a fair conclusion that the *Griffin* was of 45 to 60 tons burden. In the seventeenth and eighteenth centuries, and even now in some cases, such a ton was not a unit of weight but was a unit of space, specifically 40 cubic feet, which can be encompassed in a block four feet long, five feet wide, and two feet deep. If the *Griffin* was of 60 tons burden she had a capacity of 2,400 cubic feet (60 x 40), which is the equivalent of a box 40 feet long, 10 feet wide, and six feet deep. If the *Griffin* was of 45 tons burden she had a capacity of 1,800 cubic feet (45 x 40), which is the equivalent of a box 30 feet long, 10 feet wide, and six feet deep.

The formula for computing tonnage in colonial times, according to Samuel Eliot Morison, was the length of the ship on deck minus three-fifths of the greatest breadth multiplied by the greatest breadth multiplied by the depth of the hold divided by 95. With this formula, the known tonnage of the *Griffin*, and some additional clues, one can approximate the probable dimensions of LaSalle's vessel.

One of the additional clues concerns the draught (depth below water line) of the *Griffin*. On August 24, 1679, the

ship was in Lake Huron, according to Hennepin, "becalm'd between some Islands, where we found but two Fathoms Water, which oblig'd us to make an easie sail part of the Night." Thus the *Griffin* could navigate satisfactorily though cautiously in 12 feet of water. To do this the ship would have had to have a draught of much less than 12 feet. Even a draught of six feet would require extreme caution in sailing through uncharted waters of two fathoms.

Another clue involves the proportions of seventeenth century vessels, which were more box-like than nineteenth century sailing ships. For instance, the breadth of seagoing boats in the seventeenth century was at least one-third and probably two-fifths of the length. In 1665 the *Eaglet* of the British South Seas Fleet was 40 feet long and 16 feet wide. This boat was larger than the *Griffin*, if one accepts Hennepin's earlier statement that the latter was about 45 tons burden.

If the *Griffin* was of 45 tons burden the available evidence suggests that she was a small vessel, perhaps 37½ feet long, with a maximum breadth of 15 feet and a depth of 10 feet. These figures fit the colonial formula for a 45-ton vessel. And although the exact dimensions of the *Griffin* are not known at the present time, she certainly must have been not more than 40 feet in length and not more than 16 feet in breadth. She probably had a draught of four or five feet and a freeboard (height above the water line) of five or six feet.

RIGGING

THE ANCHORS, cables, ropes, sails, rigging, and other fittings for the *Griffin* were shipped from Fort Frontenac by sailing vessels to the head of Lake Ontario, then carried on foot to the temporary ship yard above Niagara Falls. Father Hennepin noted that the *Griffin* was completely finished and rigged by July 4, 1679.

Father Hennepin wrote very little about the ship's rigging. He mentions a vessel rigged as a brigantine (his use of the term "bark" referred to a small vessel and not a type of rig) on Lake Ontario and should have said so had the *Griffin* been thus rigged. Henne-

pin did say that she was "well Rigg'd, and ready fitted out with all the Necessaries for Sailing." With reference to a storm on Lake Huron, Hennepin wrote, "...we brought down our Main Yards and Top-Mast, and let the Ship drive to the Mercy of the Wind..." When the storm was over, "we hoisted up our Sail..." With these few simple but positive statements it is possible to make some observations about the rigging of the *Griffin*.

The mention of a "Top-Mast" and "Main Yards" suggests that the *Griffin* was not rigged as a ketch. The ketch of this period was rigged with lateen (triangular) sails and did not need topmasts. Moreover, the ketch rig would have had only one main yard (set diagonally) and Hennepin's use of "Yards" implies that there was more than one yard on the mainmast. Had the *Griffin* been rigged as a ship or a brig there should have been more than one topmast to bring down during a storm such as he describes. Also, in such an instance there should have been only one main yard and a number of other yards to bring down. And finally, ship or brig or brigantine rigging, unless unusually modified, should have been too complicated for a pilot and five men to handle on the return voyage to Niagara.

The only direct evidence from Hennepin's account suggests that the *Griffin* had a mainmast, a main-topmast, and two yards for square sails that were set on this compound mast. In short, the driving sails were on the mainmast and by implication any other sails used must have been very small and set on a mast or masts that could have been removed from the deck by one or two persons and did not require shrouds for their support. Such small sails, if present, were used for balance and ease of steering. The only driving sails were on the mainmast.

That such rigging was known in the seventeenth century is demonstrated by the pictorial embellishments on the Franquelin map of 1689. On that map, in the area of the Gulf of Mexico, are pictured two small sailing vessels 30 to 40 feet long, each with a large mainmast and a small foremast stepped close to the bow and tilted forward. The two large driving sails, both square in out-

line and each with its own yard, are set on the mainmast. A small sail, as much for balance as drive, is set on the short foremast. This style of rigging would correlate perfectly with Father Hennepin's statements about the rigging of the *Griffin* and how she was handled during the storm on Lake Huron in late August of 1679.

It is possible that the vessel also had a small lateen sail, primarily for balance, set on a short mizzenmast behind the mainmast; or it is possible that she was rigged only with mizzen sail and mainsails. Whatever the case, it seems most probable that the mainmast with its topmast was the only important mast on the ship and that the mainsail and main topsail were the most important sails. All other sails and masts were small and could be handled completely from the deck.

APPEARANCE

THE *Griffin* was a sailing vessel between 35 and 60 feet in length and of 45 tons burden, rigged with a mainmast, main topmast, mainsail and topsail and probably a small foresail set on a stumpy foremast. She was heavily built—a floating fortress, as she was called by Father Hennepin and some of the Indians who saw her. According to Hennepin, "She carry'd Five small Guns [cannon], two whereof were Brass, and three Harquebrize a-crock [swivel guns for rampart defense]. The Beakhead [a beak-like projection of the bow fastened to the stem and supported by the main knee] was adorn'd with a Flying Griffin, and an Eagle above it; and the rest of the ship had the same Ornaments as Men of War used to have."

The ship as I have reconstructed her is shown on page 3. This reconstruction does not pretend to great accuracy, but it was certainly a vessel something like this in size, construction, and rigging

that on August 7, 1679, departed from her anchorage at the east end of Lake Erie and began her long voyage to the upper lakes.

The Voyage of the *Griffin*

THE *Griffin* reached the mouth of the Detroit River on August 10 after traveling at least 240 miles. By August 22 she had entered Lake Huron and reached Michilimackinac, or present-day St. Ignace, on August 27, 1679. There she anchored in East Moran Bay. From Hennepin's account of it one can see the pattern of navigation used by the *Griffin's* pilot. He essentially followed the shore line and watched his depth of water by frequent soundings with lead weight and measured line. In the one bad storm encountered on Lake Huron the pilot ordered all sails, yards, and main-topmast removed, and allowed the ship to drift directly before the wind but away from the shore he had been following northward. Also, the *Griffin* was not setting any records for speed, having taken four days to run the length of Lake Erie and six days to traverse the length of Lake Huron.

In early September of 1679 the *Griffin* left Michilimackinac on Lake Huron and sailed westward through the Straits of Mackinac across northern Lake Michigan to an island lying just at the opening into Green Bay, a voyage of about 40 leagues (about 110 miles) according to Father Hennepin. I have elsewhere indicated my reasons for believing that the vessel coasted the north shore of Lake Michigan and came to Summer Island in Delta County, Michigan, and that this was the Island of the Potawatomis lying just at the opening into Green Bay. Here the *Griffin* remained until September 18, 1679. Loaded with furs collected by La Salle's agents during the previous winter, the *Griffin* departed from the Island of the Potawatomis and dis-

appeared with her pilot and crew of five men.

What happened to the ship is not known to this day. But evidence from Hennepin concerning his canoe voyage from the Island of the Potawatomis to the Door County, Wisconsin, mainland on September 19 and the weather conditions for the next six days show that there was a terrific autumnal gale. On the basis of the weather and the sailing habits of the *Griffin's* pilot, I would presume that the vessel encountered a storm between Point aux Barques and Seul Choix Point. At the mercy of wind and wave, in an area with no harbors, she was caught on a lee shore or one of the numerous shoals, where she struck and sank. The remains of the *Griffin* may now lie beneath the waters off Delta or Schoolcraft Counties in northern Michigan.

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¹ To do this, I have used specific statements and observations taken from Hennepin's 1698 English edition of his travels as well as some of the data and interpretations of Francis Parkman presented in his book, *La Salle and the Discovery of the Great West*. I have also weighed the statements of Father Hennepin against my knowledge of the archaeology, ethnology, post-glacial geology, and geography of the region. In addition, I have made use of my own experience with boats and navigation, which includes sailing on Lake Huron and Lake Michigan in vessels probably of greater length and draught than the *Griffin*; a voyage in 1939 up the east coast of Hudson's Bay in a freight canoe built by the Indians of Rupert House; and a trip down the east coast of Hudson's Bay in an auxiliary sailing vessel approximating the size and burden of the *Griffin*.

Report from Malaysia

D. DWIGHT DAVIS

Curator, Vertebrate Anatomy

KUALA LUMPUR, the capital of Malaysia, is a modern city of half a million people, but to the north and east there is excellent tropical rain forest within fifteen miles of the center of town. It is no trick at all to have lunch of rice and roast mouse deer with the aborigines in a forest camp, and be back in town in time for dinner at home. All that is needed is a jeep for transport, and a hot bath to

they could be trapped alive and transported back to a laboratory.

As it turned out, the Zoology Department of the University of Malaya was an excellent base of operations for such a program. It has fine laboratories and field equipment, and the staff really know the country around Kuala Lumpur, which saved a good deal of the time that usually has to be spent on explora-

cental mammals, but they are of scientific interest because the very first placental mammals must have looked and acted very much like these.

Trying to trap gymnures alive was frustrating at first. We set up a camp in the mountains twenty-five miles behind Kuala Lumpur and put out every trap we had. Gymnures are said to find durian irresistible so we hunted out a durian tree in the jungle and baited traps with the fruit. We offered immense rewards to the aborigines for every gymnure they brought in alive. At the end of six days we had caught one lesser gymnure, and it was dead in the trap. Our luck was even worse at other localities. I began to fear that the work on gymnure behavior would have to be washed out. Then just before Christmas we went back to the original camp and got three gymnures the first day and in a week I had all the material I needed. Their locomotion and feeding behavior are now preserved on motion picture film, and we have embalmed specimens for anatomical studies that will tie in with the data on behavior.

Making forays into the jungle between faculty meetings worked out so well, thanks largely to the geography of the hinterland behind Kuala Lumpur, that the Museum now has a collection of about three hundred Malayan mammals and several hundred amphibians and reptiles. Some are species not previously represented in the Museum's research collections, and others provide good series of forms that were inadequately represented. Several mammals were embalmed at the University of Malaya for later anatomical study at Chicago, and the skeletons of others were preserved. The fact that modern university facilities and rich tropical rain forest are almost side by side at Kuala Lumpur makes the University of Malaya probably the best place in the world for many kinds of tropical research.



This greater gymnure was trapped alive for behavioral studies.

wash the jungle off before dressing for dinner.

When I accepted an invitation to fill a temporary post in the Zoology Department at the University of Malaya last year, I wondered how much time teaching and administrative duties would leave for my own research program. The Museum needed a reference collection of Malayan mammals and other vertebrates, but making such collections is normally a full time job and it can scarcely be done on a university campus. Besides, ever since I had first encountered them on an earlier trip to Borneo, I had wanted to investigate the behavior of some very primitive mammals that live in Borneo and Malaya—provided

tion. The tropical forest is so close to the campus that it was always possible to get out for a few days or hours.

The mammals I wanted for behavioral studies are not exhibited in zoos and few people have ever seen them alive or even know that such creatures exist. They are rather drab-looking insectivores—the greater gymnure (*Echinorex*), nearly as big as an opossum, and the lesser gymnure (*Hylomys*), not much larger than a good-sized mouse—that somehow survived in the great tropical forests of southeastern Asia long after their relatives became extinct in other parts of the earth. They can scarcely be expected to be handsome, since they are among the most primitive of living pla-



Portion of diorama at north end of Hall 29

FEATURED EXHIBIT FOR MAY

Let's Go Uphill To Spring

LOUIS O. WILLIAMS

Chief Curator, Botany

IN the northern hemisphere spring comes to the calendar on March 21. We recognize the season not only by the date but by what the plants and, perhaps to a lesser extent, what the animals are doing. Some Chicagoans may equate spring with the arrival of the robins; others of us who haunt the woods in the vicinity may hold that spring is here when the spring beauties, the trilliums, and other early flowering plants are showing their first color.

Judged by what the plants and animals are doing, spring does not come

to all places along any given degree of latitude at the same time. On the first morning of spring this year the robins in Chicagoland may well have considered going back south, and about a week later, on Easter Sunday, winter came again. The grass, stimulated by a week of warm weather, was under a blanket of wet snow. In Rhode Island, which is about as far north as Chicago, spring was in evidence on March 21, but westward in the high mountains of Pennsylvania snow was still the order of the day, with below-

freezing temperatures at night. Down off the Allegheny Mountains and out into the Central States, spring seemed to have been in the air, even if a bit prematurely. Continuing westward and across the Missouri River into the Prairie States, where the land begins to rise again, the weather got colder as elevation was gained.

We have now added a second "condition" or dimension to spring when we find that elevation, or the lack of it, may retard or advance the arrival

(Continued on next page)

of the season.

Farther west along the latitude of Chicago, we discover that when spring—by the calendar—comes to the eastern base of the Snowy Range in Wyoming, the countryside is still held tightly in winter's grasp. If we put on skis and travel toward the pass across the Snowy Range we will go over snow perhaps five, six or even ten feet deep. Heavy snowfalls are still possible, and even probable, in the high mountains during March and April, and sometimes even into May.

By late July and early August, however, the road is free of snow and we may travel in a half hour, along a beautiful route, from summer upward to early spring.

IF at some point on the road we stop the car, we will look out at a scene very much like that depicted in this month's featured exhibit. Spring is arriving at this very moment along the edge of the snow bank to the left of the diorama before us. As we look at the spring flowers along the ridge, and our eyes travel to the right as far as the cliff where the paint brushes grow, we have progressed far into spring. Thus we find at the same place different phases of a single season.

Some of the plants in the diorama belong to the polar world and extend southward only in high mountains. The

moss campion (*Silene acaulis*), with its purple flowers, surrounds the polar regions and grows at near sea level in Alaska, Greenland, Labrador, and Northern Europe. When it comes southward it chooses the high mountains as its pathway.

The columbine (*Aquilegia caerulea*), which is near the stunted juniper and spruce along the ridge in the diorama, represents quite the opposite kind of distribution among plants. This columbine is native to and endemic in the Rockies. Here it is at the upper limit of its altitudinal range and very much reduced in size. It reaches its best development perhaps in the valley seen in the distance. The columbine has merely been following spring up the mountain slopes.

Spring is of short duration at this elevation. Spring, summer, and fall may be telescoped into a period hardly longer than a month and even during this time perhaps not a night passes when the temperature does not drop to freezing. Thus the plants that we see in the diorama are, in a sense, very special ones which have reacted to the temperature, the wind, and the short growing season. Although the spruce and the juniper may be fifty years old, they are still very small—dwarfed by the wind, the short growing season, and the temperature. Most of the flowers that we see are relatively large and brightly

colored; such flowers attract pollinators more effectively than if they were small and dull-colored. Nature selects rigorously those plants permitted to grow here. There are not many kinds that can withstand the rigors of the locality and have flowers that attract pollinators quickly; or that can grow, flower, and produce seeds in a "spring-summer-fall" which may be but a month or two long.

Before leaving the diorama, look across the way, to the high, snow-covered mountains on the other side of the valley. They are two or three thousand feet higher than our look-out into this alpine world. Fresh snow already covers their upper slopes, and from the chill in the air we feel that winter may not be too long in returning to this flower-covered ridge.

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Members are requested to inform the Museum promptly of changes of address.

MUSEUM NEWS—

(Continued from page 2)

during her childhood in California. She attended Wellesley College and then married. When her husband's business interests brought the family to Chicago Mrs. Grey renewed her interest in biology through the Museum, where she usually worked one day a week.

Her research started with the preparation of a "Catalogue of Type Specimens of Fishes in Chicago Natural History Museum" published in 1947. Later she specialized in the study of deep sea fishes. One of her most important scientific contributions is "The Distribution of Fishes Found Below a Depth of 2,000 Meters" published in 1956.

Another important paper, "Revision of the Family Gonostomatidae," which is to appear in Part IV of the *Fishes of the Western North Atlantic*, is now in press. At the time of her death she was working on the genus *Anoplogaster* for the Dana Report.

Mrs. Grey was an amateur ichthyologist whose work was of professional quality. She was particularly conversant with the literature of deep sea fishes and taught herself Russian to keep up with current Russian publications in this field. From this knowledge she always was glad to help beginning student and advanced colleague alike. Hers was a warm, generous personality that will be greatly missed.

A. L. Rand, *Chief Curator of Zoology*



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