

RARE 250-MILLION-YEAR-OLD SHARKS FOUND IN INDIANA

By EUGENE S. RICHARDSON, Jr.
CURATOR OF FOSSIL INVERTEBRATES

IT IS NOT OFTEN that a cartoon situation comes to life to plague us, but perhaps we brought it on ourselves. Two years ago we were fortunate in having a talented young cartoonist, Robin Rothman, working with us in the Department of Geology as an assistant under the Antioch College work-and-study program.



'ANYONE FOR PICKAXES?'

This frustrating situation is actually a classical predicament of fossil collectors, but the members of the Museum's Mecca Project felt that the long arm of coincidence had stretched too far when this really happened to them after Cartoonist Robin Rothman had made this prophetic drawing of their Indiana dig.

She not only cartooned our work on the Mecca Project and other phases of Museum life but produced the accompanying drawing of a not uncommon impasse in the life of any fossil collector. Perhaps it is inherent in the perverseness of things that when we have laboriously excavated a supposedly ample cavity in the landscape, we find that it should have been a little bit bigger after all. Or perhaps we never make these holes big enough to begin with. So be it. We showed the cartoon to appreciative groups of scientists at the meetings of the Geological Society of America, the Illinois Academy of Science, and elsewhere. Then, after having thus built up a fine big show of ourselves we suddenly found ourselves hoist with our own petard. This is the tale of our plight and what we have done about it.

It was recorded briefly in a corner of the June BULLETIN that Dr. Rainer Zangerl, Curator of Fossil Reptiles, and I had returned to Parke County, Indiana, to excavate the fossil remains of a large Pennsylvanian (Coal Age) shark. By that time, we had already run up against the cartooned situation. The original discovery of the shark, 250 million years old, had led, in May, to an extension of our proposed 1957 field work, made possible by the Maurice L. Richardson Paleontological Fund. In the last phase of the mapping and reconnaissance work that we carried out during April, we came upon a new exposure of black shale,

in a gully behind the farm of Mr. and Mrs. Kenneth Cloyd. We duly noted the exposure among our other data and then had a look for some fossils, since this was the same black shale whose extent and fauna we have been studying for several years. To our great surprise, a piece of shale about a foot square, lying in a small stream at the foot of a sylvan waterfall, split very readily along a major bedding plane, revealing a patch of fossil sharkskin covering the entire surface and obviously forming part of a larger area of skin extending into the formerly adjoining blocks of shale.

AN UNPRECEDENTED FIND

Now, we had never seen a patch of fossilized sharkskin before, nor had anyone else, to our knowledge. Individual scales are common in the Pennsylvanian black shale and in other rocks, but a whole square foot with the scales lying undisturbed in close-packed rows just as the shark wore them? Unheard-of! Obviously, we had to find out where that block of shale had come from. Not from the waterfall itself, we soon learned. But before long we found that it fitted like a piece of a jigsaw puzzle against the rock face of a cliff next to the fall, beneath an overhanging ledge. With our handpicks we removed another block of shale from the exposure. Lo! more shagreen (as sharkskin may be called). With feelings like those of the antiquarians who first broke into King Tut's tomb, we pried deeper. Still more shagreen! Soon, however, we could go no farther without removing the several feet of overlying rock, and for that we lacked both tools and time. Together with two more pieces found in the fallen rock below the cliff, our sample of fossil sharkskin now made a patch of about 2 by 3 feet, with a line of vertebrae running through it.

CONTRARINESS OF FORTUNE

The following week, supplied with picks, shovels, pry-bars, and other tools, and accompanied by Orville L. Gilpin and Bruce Erickson from the Museum's paleontology preparation laboratory, we descended again upon the shark. In two days we dug a hole 16 feet into the hillside, at which point the hole was 8 feet deep: a noble and imposing excavation. Then with tender care we removed the last few inches of overlying shale and lifted the blocks of the "shark level." Showing as shadowy elevations were the buried fins and the rolled-back edge of the skin where it had burst before burial of the shark. We now had about eight feet of shark laid out on the bank, including a Masonite replica of the original pieces, but here we found ourselves in the situation pictured by Miss Rothman. For the shark, instead of following the 16-foot

hole that we had laid out for it, turned and ducked under the side wall.

Returning to the Museum, we spent a day X-raying the new additions to the monster. A pair of fins was clearly visible, as was the vertebral column and the base of a skull. But two possible explanations offered themselves. If the fins were the pelvic, or rear, fins, and if the skull belonged to a partly-digested meal in the shark's stomach, we had penetrated only half-way along the creature's length. If the fins were the pectorals and the skull was part of the shark itself, we had most of what was available, the hind-quarters having been removed during the carving of the little valley by the waterfall stream.

SMALLER SPECIMENS ALSO

Accompanied by Gilpin, we returned again and enlarged our pit in the proper direction. Lifting out the slabs of shark-level shale, we soon found that we had the rest of the skull and that there was nothing beyond. The shark was now as complete as could be. Before throwing our excavated material into the valley, we had carefully searched for other blocks that might have fallen from the exposure, and we even walked down the valley, splitting all likely pieces of shale without finding the missing part of our specimen. But on returning to the Museum with our find and examining it in the laboratory, we found that we had not only the one large specimen but skulls and partial skeletons of half a dozen more. The accompanying specimens are of smaller sharks, three- to five-foot animals, all very elegantly preserved, and all of different



NEEDLE-IN-HAYSTACK IS EASIER

Dr. Rainer Zangerl, Curator of Fossil Reptiles, hunting specimens of creatures that lived hundreds of millions of years ago in bed of an Indiana stream.

kinds. One is a complete skull of an *Edestus*, hitherto known only from tooth-bearing spine-like bars about whose position and function there has been a series of

(Continued on page 7, column 1)

SOME LITTLE-KNOWN FISHES OF LAKE MICHIGAN

By LOREN P. WOODS
CURATOR OF FISHES

THERE ARE approximately 75 species of fishes in Lake Michigan proper (excluding tributary streams and connecting lagoons), but of these only 10 or 12 are of real commercial importance—namely, chubs (three or four species), lake herring, smelt, yellow perch, whitefish, carp, suckers, and walleye (in order of quantity caught).

The lake trout, formerly the most prized and for many years one of the most abundant food fishes of Lake Michigan, is now so rare that commercial fishermen no longer fish for it. Before 1945, the catch of lake trout in Lake Michigan was four to six million pounds a year.

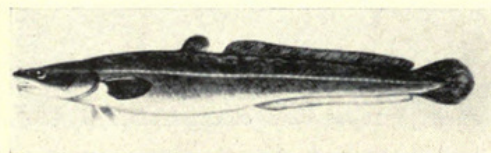
ANGLING

Sport fishing along shore is usually done for yellow perch, but occasionally other kinds, especially lake herring, are caught in late summer. Carp are frequently caught in the open lagoons and adjoining waters. Occasionally a stray whitefish takes a fisherman's bait and more rarely a sturgeon is hooked. In the spring there is considerable activity in connection with the smelt run, both with large dip-nets and small gill-nets. In some parts of Lake Michigan, especially in Green Bay and along the northeastern shore, sport fishermen angle for walleyes, northern pike, and muskellunge.

There are several little-known but very abundant species of lake fishes living along shore or in very deep water. Among these are the ninespine stickleback, trout-perch, deepwater sculpin, slimy muddler, spoonhead muddler, and burbot. Their habits, distribution, and general place in the economy of the lake are only superficially known, and most fishermen do not recognize these fishes by kind. Small fishes, such as these, are important chiefly as food for other fishes and, except for the burbot, none is longer than 8 inches.

BURBOT (LOTA)

The burbot is of great importance because it is a ubiquitous predator. It is a fresh-water representative of the codfish family



From Iowa State Conservation Commission

BURBOT

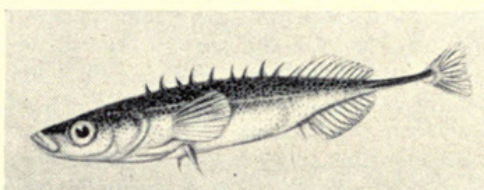
(BULLETIN, May, 1957) and, like the marine cods, haddock, and pollack, is voracious, eating all kinds of smaller fishes. Burbot are very abundant and the amount of fish they consume is enormous. The first three years of their lives, or until they attain

10 inches in length, they feed on invertebrates and later entirely on fish. When full-grown they are $3\frac{1}{2}$ feet long and weigh from 25 to 30 pounds.

Burbots live in cool and cold lakes and streams in England, across northern Europe and Asia to Alaska, and south to the Upper Mississippi River system and the Great Lakes. They are most active during the night in streams and shallow lakes, but in the deep, dark waters of Lake Michigan they are very likely active at any time. Commercial fishermen market between 75,000 and 100,000 pounds of burbot each year. The burbot is used for food, fertilizer, and cod-liver oil. The liver is enormous, about 10 per cent of the total weight of the fish. The liver oil is quite as potent in vitamins A and D as that of marine codfish.

NINESPINE STICKLEBACK (PUNGITIUS)

Chicago is near the southern limit of the circumpolar range of the ninespine stickleback. This range extends throughout northern Europe and in Asia and North America north of parallel 42° . This small (2 to $2\frac{1}{2}$ inch) cold-water species is ex-



From Commercial Fishes, USSR

NINESPINE STICKLEBACK

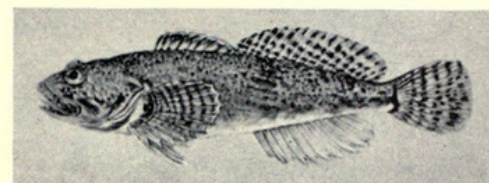
ceedingly abundant at certain seasons in the marginal waters of all the Great Lakes except Lake Erie. Around Chicago they are found in the lagoon entrances of Jackson and Burnham parks. They spawn in the spring, when the male generally builds a nest attached to grass or weeds in which the female lays her eggs. The male guards the nest until the eggs hatch (about twelve days). The food of the stickleback has not been investigated in Lake Michigan, but in other places it is known to be chiefly small aquatic insects and their larvae, small crustaceans, and in summer the fry of other fishes. Sticklebacks are especially important as food for other fishes, especially yellow perch, walleye, and burbot.

DEEPWATER SCULPIN (MYOXOCEPHALUS)

Deepwater sculpins live on the bottom of Lake Michigan and the other Great Lakes in depths of 150 to 600 feet. There is no record that they have been caught in Lake Michigan in water of less depth. They live in darkness and twilight in water that is never more than a few degrees above freezing (39° F.). They are quite abundant 16 to 20 miles offshore in depths of from 250 to 450 feet and are an important food

of the burbot and the smaller lake trout (in fact they are seldom seen except when taken from the stomachs of these two species). About the food or habits of deep-water sculpins in Lake Michigan nothing definite is known. Probably these fish spawn in early spring in deep rocky areas and their food most likely consists of aquatic larvae and the inch-long opossum shrimp *Mysis*.

Deepwater sculpins resemble the mud-dlers but have a more elongate head and body. Their fins are larger than those of mud-dlers and there are four spines on the gill cover. These little sculpins (maximum length 7 inches) live also in the streams of arctic Canada. The species in the Great



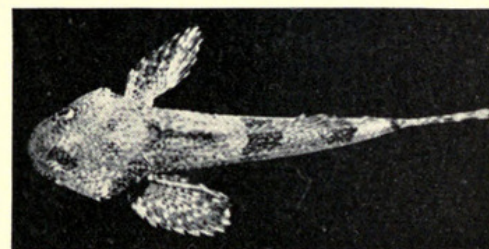
From Iowa State Conservation Commission

SLIMY MUDDLER

Lakes is a fresh-water relict of a marine group of sculpins.

MUDDLERS (COTTUS)

The slimy muddler lives in the rivers and streams tributary to Lake Michigan and in the lake itself down to depths of 400 feet. The spoonhead ranges from shore down to 450 feet but it does not live in streams. Like the deep-water sculpin both mud-dlers live on the bottom and feed on whatever small aquatic animals are available. Neither



From Cranbrook Institute

SPOONHEAD MUDDLER

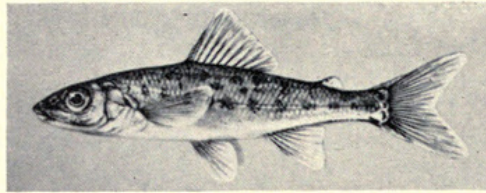
of these fishes grows longer than 4 inches and most are 2 or 3 inches long. They are important food for large perch, young lake trout, and burbot.

TROUT-PERCH (PERCOPSIS)

The little trout-perch (6 to 8 inches long) is one of the most interesting of all fresh-water fishes because it is intermediate in structure between soft-rayed and spiny-rayed fishes. The resemblances are indicated by its name, trout-perch. It has a fleshy (adipose) fin between the back fin and tail as do the trouts, whitefish, and smelt, and its ventral-paired fins are midway on the belly as in primitive fishes. It

slightly resembles the perch in having rough-edged scales and one or two spines in the dorsal and anal fins.

This species is known to shore-anglers chiefly from dead specimens found floating near shore or washed up on the beach in late



From Iowa State Conservation Commission

TROUT-PERCH

summer. In spring trout-perch migrate from deep to shallow water, moving along-shore with the smelt toward streams or bays into which they migrate to spawn, and a few are taken in the gill-nets of the smelt fishermen. Trout-perch eat all kinds of small aquatic animals and are, in turn, a principal food of the larger predatory fishes, such as pikes and walleyes.

SOUTH PACIFIC TRIBE HAS '4-H CLUB'

America's famed 4-H Clubs, organized to encourage boys and girls of rural areas to achievement in agricultural pursuits, particularly livestock raising, were anticipated centuries ago in the "pig cult" of a Melanesian tribe living in the New Hebrides Islands of the South Pacific.

While not directly comparable, there is a certain parallelism between the 4-H activities and those of the people on the island of Malekula in the New Hebrides group. In both societies the youths are given livestock to cultivate into animals exceeding the growth they would attain in a natural course of life. In America these cultivated cattle and hogs win prizes at county fairs and livestock expositions and bring fabulous prices in the market. In the Malekula pig cult, the animals, in this case boars, not only are fattened to great size but their tusks are developed into coils exceeding any growth that would occur in nature. The carcasses of these beasts end up in huge ceremonial feasts and the curled tusks become treasures jealously held as family heirlooms.

The American 4-H youth attains honors for his success in cultivating livestock. The Malekula youth gains his first recognition of manhood when he has raised a curled-tusk boar, and then all through his life his rank and privileges as a man grow in proportion to the number of pigs he raises and slaughters. Degree-giving rites are periodically held at which these honors are bestowed. The pigs are ceremoniously killed with shell-bladed axes at the festivals, the number slaughtered at one time sometimes mounting

to several hundred during a period of many days' feasting. Pork is the most highly valued of foods among these people.

The curled tusks of the boars are developed by knocking out the lower tusks so that the upper tusks can grow without being worn down. The pigs are usually kept tied up, often right in the house, and are fed soft food. On animals kept this way for years, the upper tusks grow into coils, sometimes two or three complete circles. Tusks with only one full circle are regarded as of great value, those with two coils are regarded as special treasures, and those with three coils attain an importance comparable to crown jewels, and their owners refuse to part with them at any price. For this reason it has been possible to include in the Museum's Malekula pig-cult exhibit (Hall of Melanesia, Hall A, Case 57) examples of only the single and double coiled tusks. Some of the axes used in the ceremonial pig-killings are also shown.

STAFF NOTES

Dr. Julian A. Steyermark, Curator of the Phanerogamic Herbarium, has been named chairman of the Special Volo and Wauconda Bog Committee of the Illinois Nature Conservancy. He recently lectured before the Lions' Club of Wauconda . . .

Dr. Donald Collier, Curator of South American Archaeology and Ethnology, and **Roland W. Force**, Curator of Oceanic Archaeology and Ethnology, attended a two-day conference at Edwardsville, Michigan, sponsored by the Wenner-Gren Foundation for Anthropological Research, to discuss the preparation of an encyclopedia of anthropology . . . **Dr. D. S. Rabor**, Field Associate in Zoology and chairman of the division of natural sciences at Silliman University, Philippine Islands, is working in the Museum on Philippine birds with **Dr. Austin L. Rand**, Chief Curator of Zoology . . . **Dr. Fritz Haas**, Curator of Lower Invertebrates, attended the recent meeting of the American Malacological Union at New Haven, Connecticut . . . **Dr. Theodor Just**, Chief Curator of Botany, has been appointed chairman of the Committee for Formulation of Editorial Policy sponsored by the Conference of Biological Editors.

Insect Collecting in the Rockies

Rupert L. Wenzel, Curator of Insects, has begun an expedition of several weeks' duration to collect insects in parts of the Rocky Mountains. He will work principally in the areas south of Raton, New Mexico, near Boulder, Colorado, and in the Big Horn range of Wyoming. His collections will be used in continuation of a long-time research project.

MOVIES FOR CHILDREN CONTINUE IN AUGUST

Three free programs of color motion-pictures for children in the Raymond Foundation's summer series remain to be given in August. Two showings of each program are offered in the James Simpson Theatre of the Museum—at 10 and at 11 or 11:15 (see below). Children are invited to come alone, accompanied by parents or other adults, or in organized groups. Dates and titles follow:

August 1—CURIOUS ADVENTURES OF MR. WONDERBIRD (10 and 11:15 a.m.)

A fairy tale in animated-cartoon style

August 8—THE ALASKAN ESKIMO (10 and 11 a.m.)

One of Disney's "People and Places" movies

Also a cartoon

August 15—HEIDI AND PETER (10 and 11:15 a.m.)

Sequel to the well-known story of a little girl who lived high in the Swiss Alps

Seats may be reserved for Museum Members and their children until the hour of the program. Adult leaders of groups are requested to remain seated with their groups during the entire program.

MUSEUM SCIENTISTS ON TV PROGRAM

Emmet R. Blake, Curator of Birds, will lecture on "Birds of the Chicago Area" on Sunday, August 4, at 9:30 A.M. over TV Station WNBQ (Channel 5). He will illustrate his talk with specimens from the Museum. The program is presented in the series "Live and Learn" sponsored by Northwestern University.

Several other members of the Museum staff have appeared on this program in recent weeks. They are: **Loren P. Woods**, Curator of Fishes, who spoke on Lake Michigan's finned inhabitants; **Dr. Margery C. Carlson**, Associate in Botany, who talked on plants of the Chicago area; **Dr. Orlando Park**, Research Associate in Insects, who lectured on the region's animal habitats, and **Dr. Everett C. Olson**, Research Associate in Fossil Vertebrates, who discussed the fossils found in the area.

Physical Differences

Human skulls, color charts, casts of hands and feet, and other exhibits showing some of the diagnostic characters considered by physical anthropologists in differentiating racial types are to be found in Chauncey Keep Memorial Hall (Hall 3—Peoples of the World).

Like Some People . . .

TALKING BIRDS SOUND OFF WITHOUT THINKING

By AUSTIN L. RAND
CHIEF CURATOR OF ZOOLOGY

IF WE CONSIDER imitation as the sincerest flattery, talking birds are certainly flatterers. This perhaps explains in part why talking birds are such popular pets.

In the western world, parrots are best known as talkers, but well known in the Orient are others. J. D. D. La Touche, who studied the birds of China for years, writes that a starling, a favorite cage-bird of the Chinese, is a good talker equal to any parrot.

Better known perhaps is the mynah, a jay-sized black starling with vivid yellow beak and head wattles, that lives from India to Java. Of its voice Stuart Baker writes that like all its near relatives it has a wide repertoire of notes, melodious, noisy, and raucous, and is an admirable mimic, copying the notes of other birds in the wild and learning to talk well in captivity.



From this one might conclude that mimicry in the wild would be a good clue as to whether or not a bird could be taught to talk. But what we know of the African grey parrot, reputedly one of the best talkers, does not support this. Dr. J. P. Chapin studied birds for many years in the upper Congo River forests where the African grey is one of the common and conspicuous birds. The notes he heard from it were harsh screeches and pleasant whistles, and he heard no imitative sound from any wild parrot.

MOCKINGBIRD HIGHLY TALENTED

The extreme in mimics is our mockingbird. Its scientific name, *Mimus polyglottus*, means the many-tongued mimic. Its common name in English stresses the same characteristic of the bird. Certainly its record is impressive. A wild bird, singing, has been known to introduce 58 imitations in seven minutes of singing, according to W. L. Dawson. In Boston, C. L. Whittle recorded 39 bird songs, 50 bird calls, and the notes of a frog and a cricket all given by one mockingbird. The mockingbird imitates other sounds, too—the barking of a dog, the squeak of a wheelbarrow—and it even takes an interest in human music. The

Grinnells tell of a mockingbird that was attracted to a phonograph on the lawn, apparently studied the music played, and then reproduced it in his song, even repeating piano notes with the phonograph ring. Yet strangely the books at hand say little about this bird's ability to imitate human voices. Perhaps it's only because mockingbirds have not been adequately trained.

Besides the better-known talkers there are other kinds that learn to say a few words, notably ravens, crows, and jays. Perhaps as we get to know them better many song-birds may be found to be capable of saying a few words. But these could be only the birds with better-developed syrinxes because a syrinx, not a larynx, produces the bird's voice.

Talking birds are presumably playing or doing something in their leisure time. They must be active because it is their nature to exercise their muscles. Some birds just scream, chirp, or sing; some imitate sounds in nature or human speech, while others hop or flit about or soar quietly overhead, each enjoying its activities in its own way. To illustrate the relation between ordinary bird-talk and imitating humans, a lone budgerigar is said to spend much time warbling bird-talk to itself and when trained to "talk" carries on a soliloquy in the same way.

UNAWARE OF MEANINGS

Birds don't understand what they're saying. But as in any training tricks of animals, certain words can be associated with certain conditions and appropriate phrases can crop up in some circumstances. And this, of course, is the beginning of understanding the meaning of speech. But it's so rudimentary that it's hardly as far advanced as the dog that "understands" vocal guides in performing tasks to which it is trained or expression in its master's voice. But again there are reports I simply don't believe, like the story of the Paris clergyman's sparrow that knew the Lord's Prayer and the Ten Commandments. When wild sparrows stole food from behind the bars of its cage it was supposed to say, "Thou shalt not steal."

As a boy I was told the widespread belief that to make a crow talk one should split its tongue. Apparently it's as widespread as the belief that one way to catch birds is to put salt on their tails. But the bird's song-box, the syrinx, is deep in its chest, where windpipes branch into the lungs, and no mutilation of the tongue in its mouth can improve its utterances.

The exhibits of Philippine, Malayan, Indonesian, and Formosan ethnology have recently been renovated in Hall A.

Collector Home From West

Henry S. Dybas, Associate Curator in the Division of Insects, recently returned from a six-week collecting trip in the Pacific Northwest. The purpose of the trip was to collect a poorly understood group of microscopically small beetles that live in the forest floor and in other situations. Laboratory facilities for the special equipment were provided by the University of Oregon at Eugene and by the University of Washington at Seattle. Alex K. Wyatt, Research Associate in the Division of Insects, joined Dybas for the last part of the field work.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the past month:

Department of Anthropology:

From: Mr. and Mrs. Paul M. Cook, Dunnellon, Fla.—archaeological material, Arizona and Iowa; Miss Frances Glover, Chicago—5 wooden combs, Burma; J. Langewis, Kyoto, Japan—textile sample

Department of Botany:

From: Roy H. Degler, Jefferson City, Mo.—*Viola missouriensis*; Mr. and Mrs. Herbert Pahnke, Chicago Heights—*Podophyllum peltatum* f. *Deamii*; A. Alvan Vasquez, Iquitos, Peru—6 plant specimens, 5 wood specimens

Department of Geology:

From: Teddy Czyzewicz, Chicago—miscellaneous fossils, Braidwood, Ill.

Department of Zoology:

From: Walter Cherry, Winnetka, Ill.—2,500 sea-shells; Dr. Henry Field, Coconut Grove, Fla.—34 frogs, 56 lizards, 85 millipedes, 42 centipedes; General Biological Supply House, Chicago—13 sea snakes, California and India; Dr. Robert F. Inger, Homewood, Ill.—a fish, Louisiana; Dr. Marshall Laird, Singapore—7 frogs, 12 lizards, 5 snakes; W. H. Phelps, Caracas, Venezuela, a birdskin; Dr. Jeanne S. Schwengel, Scarsdale, N. Y.—49 lots of marine shells; Vernon Wesby, Chicago—3 fishes, northern Manitoba; Loren P. Woods, Homewood, Ill.—25 fishes; Raymond E. Stadelmann, Medellin, Colombia—2 bats; U. S. Geological Survey, Washington, D. C.—12 snails of the endodontid genus *Beilania*, Koror, Palau Islands; Louis and Rua Williams, Bethesda, Md.—a mammal, Honduras; Dr. Charles L. Camp, Berkeley, Calif.—a salamander, a lizard, 3 snakes; Dominion Museum, Wellington, New Zealand—9 lots of land and fresh-water snails, New Hebrides; Michael Duever, Chicago—a rattlesnake; University of Florida, Gainesville—2 fishes; Thomas MacDougall, New York—2 eels; Dr. G. E. Maul, Funchal, Madeira—6 fishes; Dr. Cornelius Philip, Hamilton, Mont.—2 horseflies, Philippines; Dr. Karl P. Schmidt, Homewood, Ill.—9 lizards, Texas; Dr. Conrad Yunker, Cairo, Egypt.—a lizard; Renato Araujo, São Paulo, Brazil—121 army ants; Carnegie Museum, Pittsburgh—3 fishes, Guam and Colombia; Lloyd G. Gage, Yuma, Arizona—6 species of lower invertebrates, Gulf of California

INDIANA SHARKS—

(Continued from page 3)

varying interpretations that our specimen will finally resolve.

Aside from the spectacular quality of the large and well-preserved specimens, the Cloyd Gully sharks are of notable scientific interest. From the Mecca Quarry (see BULLETIN cover) and from localities in the same black shale in several places in Parke and Vermillion counties, Indiana, we had already recovered several hundred specimens of smaller sharks and other marine vertebrates. Those, now in the Museum's research collection and soon to be studied, are the only complete specimens of Pennsylvanian sharks yet found. About seventy years ago, three partial specimens were described from a Pennsylvanian black shale in Illinois by the great paleontologist, Edward Drinker Cope, but he lacked X-ray equipment for properly examining them, and indeed described them without having even removed a layer of overlying shale. Consequently his descriptions are vague and his illustrations, like the specimens, look like meaningless jumbled bumps in the rock. We have those specimens also in the Museum, thus giving us at present a monopoly on all the Pennsylvanian shark specimens in the world.

HURRICANE INTERVENES

This deposit of sharks being of such great scientific interest, we have increased the intensity of our attack upon it. In June we hired a bulldozer and had an area of several thousand square feet exposed, adjoining our small hand-made quarry, with the kind permission of Mr. and Mrs. P. H. Logan, owners of the land. We had intended to stay with it at that time and remove all the specimens in that area, but no sooner had the bulldozer rumbled off up the hill and left us with a veritable banquet before us than Hurricane Audrey, fresh from her foray through Louisiana, dumped nine inches of rain on us in one night. This excessive precipitation brought a considerable amount of clay down from the hillside into the quarry. Another unforeseen effect was the suspending of a good-sized lake above us, like the sword hanging above Damocles. In excavating the new quarry, we had the bulldozer push the clay and rock into the valley, making a dam across the little stream. In the normal course, this would have gradually created a pond on Mr. Cloyd's land while the dam settled and seasoned. However, Audrey filled the pond to overflowing as soon as the dam was built, and part of the face of the dam slipped down into the quarry. Not wanting to be beneath if the 25-foot-deep lake should suddenly drop in on the quarry, we returned to Chicago to let things simmer down. As this is written, we are about to leave again in the hope of finally getting those sharks out of there and

back safely to the Museum.

We began the Mecca project with two objects: to collect and study the specimens as a record of the life of a shallow Pennsylvanian sea and to secure evidence on the environment of that sea so that we could give a complete description of the ecology of that time and place. The original Mecca Quarry at about the time of the removal of the last shale from it in 1954 was only about 12 by 15 feet as compared with the 150 by 25 feet of the quarry in Cloyd Gully. The difference in size is significant. In the first case, we found numerous fragments of fossils as well as complete specimens, and the area uncovered provided us with sufficient material for a detailed study of distribution as well as an adequate collection of specimens. In the Cloyd Gully area, conditions were slightly different at the time when the fossils were buried. There are very few fragments of fossils, and the whole specimens are rather better preserved than at Mecca. Both sites were deposited in shallow, quiet, weed-covered water partly closed off from the open sea by bars. While we have not yet seen and evaluated all the evidence in the Cloyd Gully locality, it appears that it was a much less thickly populated area than was Mecca, and that the big shark with its accompanying smaller ones may have come in over the bar during temporary high water only to be trapped there when the water withdrew. In a very short time the water may have become foul, killing the sharks, and so shallow that the bloated carcasses could not float around and scatter. Indeed, there is evidence that the water almost entirely withdrew, letting the cover of floating vegetation down onto the dead animals, thus holding them in place. Following the episode of the burial of the sharks, the water again became several feet deep, and ultimately the barrier ceased to be effective, permitting a normal fauna of marine invertebrates to occupy the area.

While we are busily uprooting sharks from Cloyd Gully in the next few weeks, we will be constantly hoping that Robin Rothman's cartoon will not be prophetic again, and that all of our specimens will stay considerably within the excavated area. For that matter, we also hope that she will not surreptitiously make a cartoon of a hurricane.

Taconite Exhibit

An exhibit of taconite, a low-grade iron ore that is assuming greater importance in our economy because of depleted supplies of hematite, the high-grade ore, has been added to the Hall of Economic Geology (Hall 36). The exhibit includes specimens, a map of known deposits, and a chart illustrating present-day methods of processing taconite for use as a commercial ore.

THROUGH MUSEUM ON WHEELS



During their "Holiday on Wheels," a three-day visit to Chicago by 66 victims of muscular dystrophy, Ward Beckam, of Indianapolis, and Jeannie Arvin, of Lafayette, both 7, and Norma Hank of Indianapolis, office secretary for the Indiana State Muscular Dystrophy Association, pause to see one of the Museum's two marble lions from Peking, China, in Hall 24 (Ancient Chinese Civilization).

Both child and adult muscular dystrophy patients participated in the outing, which included visits to many Chicago landmarks. The trip was arranged by the Indiana State Muscular Dystrophy Association, which has headquarters in Indianapolis.

LAPIDARIES SEEK RECRUITS

Wanted: More "rockhounds."

The Chicago Lapidary Club, which held its Seventh Annual Amateur Handcrafted Gem and Jewelry Competitive Exhibition at the Museum in June, is already preparing for its 1958 show. Persons interested in the hobby of collecting gem materials, polishing them, and making jewelry are urged to get in touch with Tom Priest, secretary of the club, whose address is 2007 Calumet Avenue, Whiting, Indiana. Since the work of preparing exhibits is an exacting process that goes on all year, early contacts are advised. Inquirers will receive an invitation to a club meeting as well as general information.

Museum Invites Children During School Vacation

Every child is invited to make at least one visit to the Museum during the summer vacation that is now in full swing. Parents are reminded that the Museum is a haven of safety for their children—a place where it is cool on sweltering days, where all influences are good, and where education continues while the youngsters are only aware of having fun.



Richardson, Eugene S. 1957. "Rare 250-Million-Year-Old Sharks Found in Indiana." *Bulletin* 28(8), 3-7.

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