

COMET KOHOUTEK

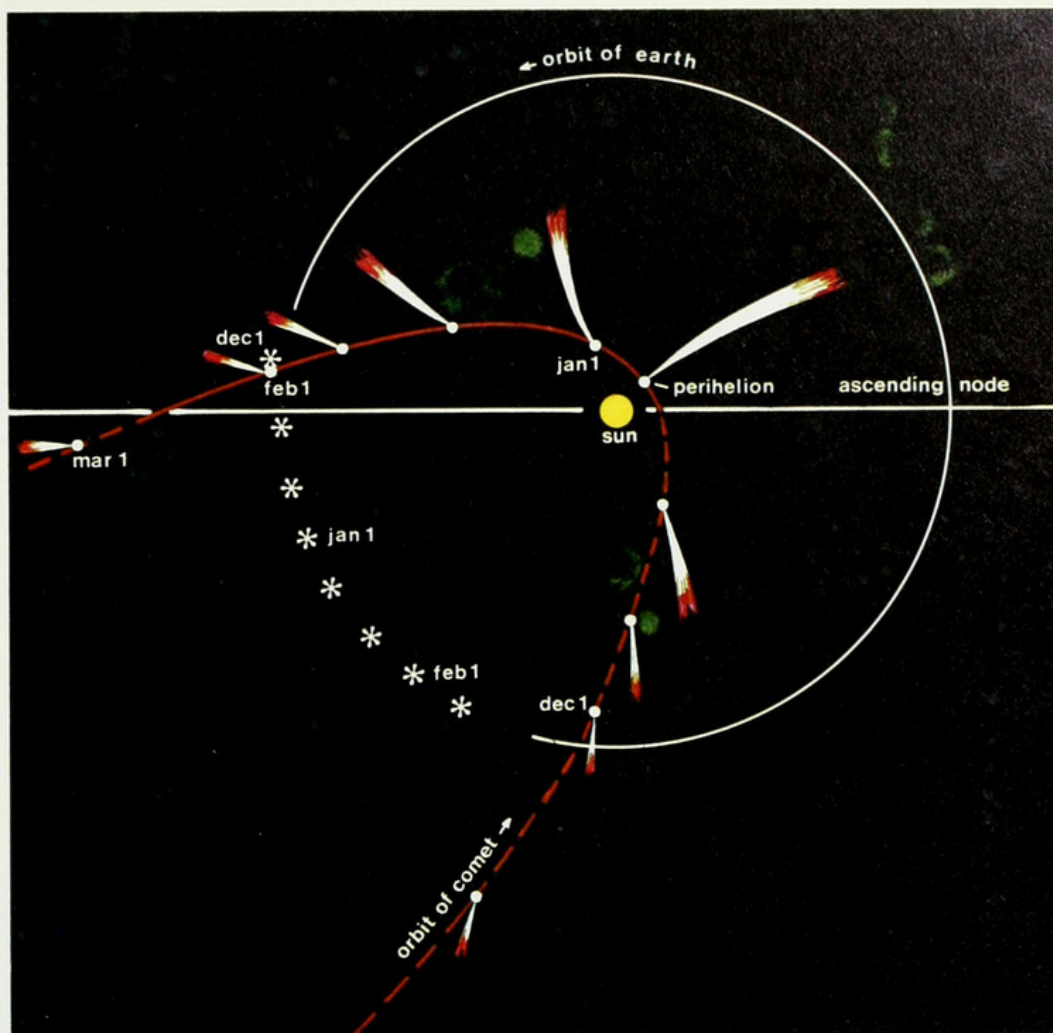
*brilliant celestial visitor
visible in December*

By Albert V. Shatzel

Comets are among the most intriguing of celestial visitors, arriving as they often do unannounced, dramatic in appearance, exhibiting sudden changes in structure, and fading into oblivion after only a few weeks or months on the celestial stage. The few which are visible to the unaided eye attract special attention, and until quite recently were regarded with awe and superstition, as omens of evil and harbingers of the plague or other dread events. A comet, quite by coincidence, foretold the death of Charlemagne, and others have been credited with similar spectacular powers.

In reality, however, most (if not all) comets are members of our solar system, moving around the sun in elliptical orbits, as do the planets and their lesser relatives, the asteroids. The orbits of most comets are much elongated, so that they move outward well beyond the orbit of the most distant planet, Pluto, and may require thousands of years to complete a single circuit of the sun. They seem to be made up of fragmentary dust-size particles, although the nucleus may be a more or less compact mass of appreciable dimensions (perhaps a few hundred feet or more across).

Albert V. Shatzel is a volunteer photographer for Field Museum and a faculty member of Kendall College.



The path of Comet Kohoutek as seen from above the plane of the earth's orbit. Perihelion (when the comet comes closest to the sun) is December 28. The ascending node is the point at which the comet passes north through the plane of the earth's orbit. Positions of earth and comet are shown at 10-day intervals.

As a naked-eye comet approaches the sun it develops a tail which points generally away from the sun. It also increases rapidly in brightness as it nears perihelion (the point in its orbit nearest the sun). Research has shown that the comet's light is derived in part from sunlight reflected from solid particles and partly from glowing gases. Some of this material is "pushed" away from the sun by radiation pressure and other little-understood mechanisms.

There are always several comets around bright enough to be photographed with a telescope; a dozen or so are currently within reach. At least eight have been discovered thus far in 1973 and more are certain to appear. The sixth, designated 1973f, was discovered at Hamburg Observatory on March 7th by Lubes Kohoutek, only eight days after he had discovered Comet 1973e. Comet Kohoutek promises to be unusually

bright, perhaps brighter than any comet seen so far in this century, and may even become visible in the daytime sky. It is always wise to hedge a bit on such predictions, since we have no way of knowing precisely how bright it may become. It passes perihelion on December 28, at which time it will be only 13 million miles from the sun (compared to a distance of 36 million miles for Mercury—the planet closest to the sun). Prior to that time the comet will be a brilliant object in the morning sky rising in the southeast before sunrise during early December, brightening gradually until the morning twilight begins to interfere (about December 20). At this time Comet Kohoutek will rival Venus in brilliance. It will again be visible in the evening sky about New Year's day, setting after the sun in the southwest. It will appear higher and higher in the sky and fainter and fainter each night as it

(Concluded on page 11)

A small notice posted in the Department of Geology office reads "Rare monsters fabricated to any specification. Orville Gilpin & Associates." Although the notice is not meant to be taken seriously, it could well be. For over thirty years Orville Gilpin, chief preparator of fossils, has been reconstructing prehistoric monsters in all sizes for Field Museum.

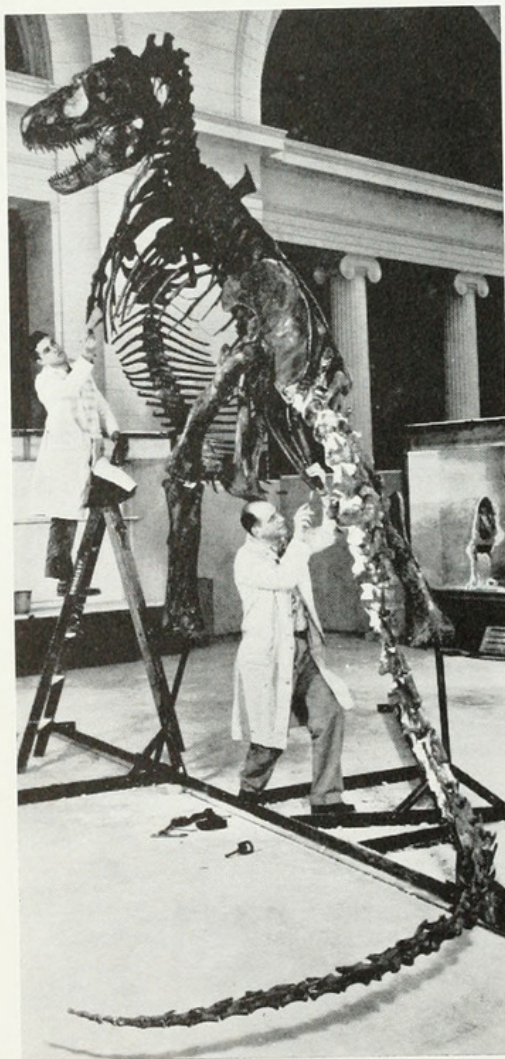
The huge dinosaur skeletons displayed in Stanley Field Hall are the largest creatures Orville "Gilly" Gilpin has mounted and it took him two years (1954-56) to do the job. The *Lambeosaurus* bones were found in the Badlands along the Red Deer River in Alberta, Canada, and came to the Museum in the early 1920s. The *Gorgosaurus* was purchased unassembled from the American Museum of Natural History; then Gilly and his assistants went to work. They first removed the top layers of rock from the *Lambeosaurus*, which had been collected in seven pieces. Since this dinosaur was to be exhibited in a prone position, Gilly left it resting in the same rock in which it had lain for some 60 million years. He then put the seven pieces on dollies, fitted them together, and filled the seams between the blocks. Even today the *Lambeosaurus* remains on these dollies, which proved helpful when the dinosaurs were moved.

The erect *Gorgosaurus* skeleton, however, presented a greater challenge to Gilly's ingenuity. First, like a fantastic and ancient puzzle, the bones were spread out and sorted—the vertebrae arranged in proper sequence, the limb bones according to their position in the legs, and so on. Calling on knowledge accumulated during his years at the Museum and with the aid of the scientific literature, Gilly was able to readily identify these bones and place them in their proper positions.

Because the skeleton was to be free-standing, internal metal supports were to be used. This meant that bones had to be drilled or broken and

GILLY THE DINOSAUR BUILDER

By Patricia M. Williams



Orville "Gilly" Gilpin (rt.) and an assistant complete finishing touches on the *Gorgosaurus* skeleton, 1956.

repaired, and restored many times. Working in the low-ceilinged paleontology laboratory, Gilly and his aides had to mount the dinosaur in sections. First the neck, head, and rib cage were carefully assembled. Then, following a tedious "fit and try" method, bolts of proper size were selected and iron rods put through bones of the rear legs and pelvis and welded together.

As the skull and jaws of the towering *Gorgosaurus* weigh more than 200 pounds, special steel braces were required to support them. Slowly and painstakingly Gilly fashioned two pieces of iron rod to run through the vertebral column into the skull, and metal plates were inserted between the vertebrae. All along the way Gilly had to shape the rods by heating them in the Museum's huge furnace and then bend them to fit the skeleton. Properly bent and shaped, the pieces of iron were taken to a steel works where they were to serve as a pattern for the final high-strength steel braces. Unfortunately, the steel work's night clean-up crew mistook the crooked iron pattern for waste material and cut it into pieces for disposal! Rather than spend time needed to make a new pattern, Gilly estimated the width of saw cuts and precisely reassembled the original pattern.

After the many trial-and-error tests necessary for every bend in the iron, for every hole drilled in the bones, and for every fitting made, the *Gorgosaurus* lower section (pelvis, hind legs, and tail) was assembled. The now two-part skeleton was taken to the Museum's spacious paint shop on the fourth floor and for the first time the complete skeleton rose to its full height. Then, with apparently inexhaustible patience, the *Gorgosaurus* had to be taken apart again to be transported to Stanley Field Hall. Finally reassembled there, the standing *Gorgosaurus* became the

Patricia M. Williams is managing editor of Field Museum's scientific publications.

world's first self-supporting dinosaur skeleton.

Installed in 1956, the Museum's *Gorgosaurus* and *Lambeosaurus* are not only scientifically accurate but aesthetically satisfying as well. *Gorgosaurus*, the carnivore (flesh-eater), is triumphantly raised over the defeated herbivore (plant-eater). *Lambeosaurus* stands in a very natural and lifelike pose. As Gilly says, "It can stand there for centuries and not get tired."

A problem worse than fatigue set in when the skeletons were moved in 1968. The heavy skull of *Gorgosaurus* was to be cast in fiberglass. In the process it fell and was smashed on one side. Gilly worked all night to repair the skull so that work could proceed on schedule the following morning. Impressive as the dinosaur pair in Stanley Field Hall is, Gilly considers the *Edaphosaurus* and *Dimetrodon* skeletons in Hall 38 to be his finest work. These restorations went well, and he "felt good about it" and, again, they are posed so that they look "comfortable."

Not all of Gilly's projects are as spectacular as those on exhibit. His day-to-day work consists of removing matrix (the rock in which fossils are embedded) from specimens and preparing them for study or exhibition. Fossils to be used only for study are not mounted; and missing pieces are not restored. Those specimens which are to be used for exhibition are restored to their original shape as nearly as possible and plaster is added in place of missing parts. For example, a turtle shell from Wyoming had been crushed and flattened during fossilization. Gilly recently restored it by assembling the hundreds of pieces—all of which look alike to the untrained eye—rebuilding the shallow, dome-like shape of the shell, and bonding the pieces together with plaster.

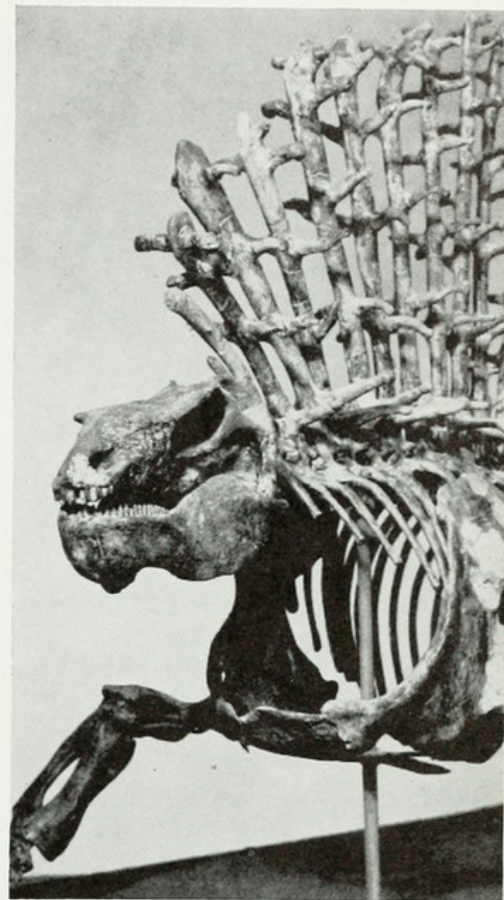
Simply removing matrix is a

time-consuming, tedious, and often delicate job performed with improvised tools. Gilly spent 18 months scratching and scraping with a "brush" of phonograph needles mounted in a metal handle before a large Pennsylvanian shark—formerly on display in the "Illinois By the Sea" exhibit—could be revealed in its present wealth of detail.

Gilly came to Chicago with the hope of working outdoors, and never dreamed of doing so as a preparator. Born in northern Minnesota, Gilly taught there "in a little red schoolhouse—all eight grades in one room." He then returned to school to study forestry and came to Chicago with the hope of working in the forest preserves. Jobs were not plentiful in the 1930s; Gilly had to take a short-lived job in a factory and soon found himself laid off. After searching in vain for another job, Gilly turned to the Works Progress Administration (WPA) and was sent to Field Museum where "they gave me a hammer and a chisel and a bone to clean up. I took to it like a duck to water and I've enjoyed it ever since."

Gilly advises young people interested in this work to obtain practical training by volunteering at a museum or obtaining a government-financed assistantship, since schools don't offer courses in dinosaur-building or fossil preparation. Gilly has trained several young people, including preparator John Harris, and he believes that the main qualification for fossil preparation is "being able to coordinate the hands and the mind." He explains that each fossil is unique—"you only get one chance at it"—and each presents its own problems. A preparator must be able to analyze the problems in scraping or restoration and find his own solutions. This problem-solving may well include improvising one's own tools and techniques.

One of Gilly's dreams is to someday reconstruct the skeleton of a *Stegosaurus*—one of the rare Jurassic dinosaurs. With the fervor of a



Gilly's reconstruction of a fossilized *Dimetrodon*, an ancient reptile, is in Hall 38.

politician in election year Gilly says, "the children and people of Chicago are entitled to a *Stegosaurus*!" The problem is that *Stegosaurus* skeletons are extremely rare. The Museum has none and it could take ten years of expensive searching to locate one. Although it would be possible to buy casts of *Stegosaurus* bones, Gilly refuses to settle for less than the real thing, the best—"something befitting Field Museum."

While there are no funds currently available for a *Stegosaurus* search, that situation could change. In his lab Gilly has a flower-bedecked coffee can topped with a sign reading "Save the *Stegosaurus* Foundation." A slot in the top of the can is big enough to accept coins and bills of all denominations. So far only toy money has been contributed, but Gilly is a patient man and the fund-raising drive may continue for a long time.

The Hospitalization of Field Museum

By G. Henry Ottery

The trustees and staff of Field Museum had more than one reason to breathe a heavy sigh of relief at the end of U.S. involvement in World War I. It also signalled the end of the U.S. Army's intent to modify the Museum's Grant Park building, then under construction, for use as a convalescent hospital for returning wounded soldiers.

The government's plan was first revealed by Museum President Stanley Field to the board of trustees during a special meeting at the Chicago Club (then at 400 South Michigan Avenue), on September 18, 1918. Field had called the meeting ostensibly to consider a joint report from the new building's architects and the building committee. It called for modifications, substitutions, and omissions of materials and plans provided for in the specifications of the new building, in order to reduce its cost and complete it within the estimated funds available. The report, of considerable length, was studied and discussed in great detail before it was approved by the trustees. They couldn't yet know that the government would soon present its own plans for cost-cutting and other alterations.

Then came the startling news. Mr. Wallace G. Clark, acting for J. Milton Trainer of the U.S. Army's General Staff, Real Estate Service, Hospital Division, had called upon Field and presented to him the possibility that the government would desire to occupy the new Museum building for an indefinite period as a convalescent

hospital. The government would assume certain responsibilities and obligations and expenses necessary to prepare the building for its use. Field had agreed to present the matter to the trustees, although he had warned Clark he believed that, under the circumstances, it would be negatively received.

What "circumstances" could possibly have prevented these patriotic and humane men from wholeheartedly accepting such a proposal? One can imagine that such items as construction changes, unforeseen drains on the Museum's funds, and even the permanent loss of the new building and its land were possibilities to be considered.

Of even greater concern, however, was the Museum's ability to continue to function as a research and educational institution. The building the Museum was occupying in Jackson Park had been built to survive only the summer of 1893, when it was the Fine Arts Palace of the World's Columbian Exposition. Now it was 25 years old and literally falling apart, endangering not only the collections and staff, but also the visitors. Only a major and thorough rebuilding program could make it habitable for several more years.

Urging abandonment of plan

Field also told the trustees that Brigadier General W. E. Noble of the surgeon general's staff would be calling upon him to further discuss the

matter; Field asked for instructions from the trustees.

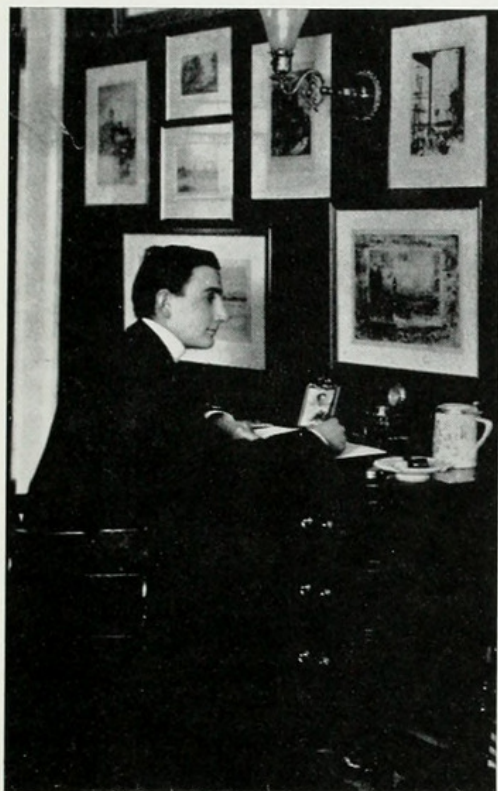
After fully discussing the government's proposal, the trustees drew up a formal statement asserting that while they recognized their "patriotic obligation to do all and everything in their power to meet the emergencies of the war" and would consider it "an official and personal privilege to meet any suggestions, or grant any requests, or perform any act" that the government in the circumstances of war might call for,

Nevertheless, they recognize their responsibilities as trustees of priceless educational material and of scientific objects and collections it would be impossible to procure or reproduce, they respectfully represent that the occasion for pushing the completion of the new building in the face of largely increased expense of labor and construction material has been considered imperative because of the insecurity of the building at present occupied as a Museum, whose weakening and decaying condition has become an extreme menace to the security of the collections, exhibits and other scientific and educational materials now contained therein by reason of the constant danger of the collapse of the building in parts, if not as a whole, and the constant hazard of fire. The destruction of this material by reason of the character of its endowment and the source of its income would result in the entire abandonment of the Museum and the discontinuance of the great educational work it is now performing. Such calamity would render the new building useless to the trustees.

They concluded by stating that the board "begs the representatives of the United States Government to withdraw the proposal to occupy the new Field Museum building in Grant Park."

Friendly (?) persuasion

President Field presented the trustees' statement to Gen. Noble and other representatives of the government. Many meetings, conferences, and interviews followed, with the Museum's



Stanley Field as a young man

architects in attendance. The government presented its arguments. The Museum attempted to dissuade. The government insisted. The Museum objected.

When Field reported back to the trustees on October 3, he knew the Museum had lost the argument. He told them that the government was firm in its desire to occupy the building, intended substantial renumeration, and would meet as far as possible the necessity for partial occupation of the new building by the Museum. Field had reached the conviction that an arrangement should be entered into as satisfactory as further negotiations would permit. The trustees approved a motion permitting the concluding of negotiations.

Further, they authorized the government's use of the lumber that had been accumulated for Museum construction in the erection of several temporary buildings to be used for hospital purposes. On a blueprint dated October 19, these buildings,

directly to the south of the Museum, included the main kitchen, the nurses' quarters and mess hall, soldiers' barracks, a fire station, and a garage—all connected to the Museum by a covered passageway. To the north, a military canteen was planned.

The Army's specifications

On October 17, only one day less than a month after Field originally presented the government's proposal to the trustees, a 53-point memorandum listing specifications for the "hospitalization" of the Museum was issued. The 53 points embraced changes to be made in the original specifications that had been prepared by the Museum's architectural firm, Graham, Anderson, Probst & White.

The government substituted a one-inch layer of cement where terrazzo floors had been specified on the Museum's first and second stories. Temporary wood doors and frames were to replace the bronze and ornamental mahogany doors about the main entrances. Light fixtures throughout the building in general were to consist of bulbs at the ends of drop cords, with metal shades. A large elevator serving all floors was to be installed in addition to the one freight elevator, passenger elevator, and sidewalk lift shown in the original plans. All power plant equipment was to be installed in duplicate (except boilers, stokers, and coal- and ash-handling machinery) so that the building could be operated fully with any one piece of equipment out of service. One large open court and two small open courts were to be constructed in the west half of the first floor.

It is amusing today to think of the Museum having 220 "water closets" (with seats costing \$4.90 each) and 35 enameled iron bath tubs, as designated by the government's planners. They were to be part of 716 plumbing fixtures that also included 140 showers, doctors' scrub sinks, a dental lavatory, diet kitchen sinks, and others.

Termination of lease

Meanwhile, in Jackson Park, the old building, too, was suffering the effects of the war. Museum Director Frederick J. V. Skiff, in the annual report for 1918, states that "The Museum has felt the common influence of the war upon its economic affairs, and operating upon a fixed income has reduced its expenditures as far as possible to the necessities of maintenance." Without touching the funds for the construction of the new building, how could the trustees ensure that the old, decrepit building would continue to be usable?

Fortunately, the uncertainty of the Museum's future was resolved with the European armistice. By the late winter of 1919—less than six months after the trustees first learned of the government's plan—the government sought to abandon its lease-contract with the Museum, signed on October 22, 1918. On March 7 the trustees authorized the signing of the release upon the Museum's receipt of \$87,215.16 "in full payment for all obligations of the lessee to the lessor."

Thus, the Field Museum's future was back on course, and the building was constructed as originally intended. But the activities of those few months, as could be expected, had their effects. "The resulting increase in building operations in accordance with the terms of the contract, and the subsequent sudden cancellation by the government . . . had naturally a confusing and disturbing effect upon the affairs of the Museum," wrote Skiff. He noted that preparations for the transfer to the new building had been under way for some time at the signing of the contract, and that this activity was "more actively prosecuted" and packing methods were changed in the expectation that material would have to be stored for several years. Nonetheless, he concluded, the transfer to the new building would probably take place in the autumn of 1920. And it did.

FIELD BRIEFS

Below, Museum visitors during October included this woman and boy, both blind, from Denmark. By touch, they are examining "Bushman Family, Kalahari Desert," a bronze group sculpted by Malvina Hoffman. These visitors were among a group of ten blind Danes whose trip was sponsored by Disabled Americans Denmark Meeting (DIADEM); their Chicago visit was arranged by the Consul General of Denmark in Chicago.



Photo by John Bayalis, Jr.

During a luncheon meeting designed to acquaint business leaders with the Museum's forthcoming Contemporary African Arts Festival; Museum President Remick McDowell (left) and Maude Wahlman, Museum consultant in African ethnology, examine a color etching by Nigerian artist Bruce Onobrakpeya with (from right) Millard D. Robbins, Jr., president, Robbins Insurance Agency; Daryl F. Grishman, president, Parker House Sausage Co.; and Dr. Clyde Philips.

Below, Dr. William D. Turnbull (left), Field Museum's associate curator of fossil mammals, confers with paleontologists Dr. Zofia Kielan-Jaworowska, of Poland; and Dr. K. N. Prasad, of India. Dr. Kielan-Jaworowska was here for a week's study of the Museum's Early Cretaceous mammals from the Trinity Formation of Texas. Dr. Prasad was here for nearly two weeks, mainly to investigate Eocene, Miocene, and Pliocene mammalian faunas of North America. Dr. Turnbull recently completed two months of field work and fossil collecting in Wyoming.



Photo by John Bayalis, Jr.



Photo by John Bayalis, Jr.

Busily decorating for A Christmas Afternoon at Field Museum are (from left) Mesdames Wesley M. Dixon, Jr., Henry D. Paschen, Jr., and B. Edward Bensinger. Friday, Dec. 14, from 4 to 7 p.m., is the time for the festive occasion, which will take place in Stanley Field Hall. Caroling, dancing to the merry tunes of Leo Henning's orchestra, sugar plum fairies, clowns, and a grand march are among the many attractions. With refreshments, of course!

Tickets are \$10 for adults and \$5 for children, and are available through the Women's Board of Field Museum, sponsors of the event.



Photo by John Bayalis, Jr.

Exhibits of Tibetan and Chinese cultural artifacts captured the attention of 85 members of the National Chinese Opera Theater during an October visit and reception at the Museum. Pictured with Miss Wu-Mei Ai of the Chicago Chinese Consulate office, four of the performers examine a Ming temple censer cast in 1548. The opera company, in Chicago for three performances, preserves the ancient art of Peking opera, banned from mainland China during the cultural revolution of the 1960s.

Do Christmas Shopping at Museum

Don't forget that one of Chicago's most interesting gift shops is located in the Museum, and that you—as a Member of the Museum—receive a 10 percent discount

on your purchases. Choose from sculptures and jewelry from many lands, natural history books and objects, tapestries and tea sets, and other unique gifts too numerous to mention here. Shop anytime during normal Museum hours for those unexpected and exciting Christmas gifts.

Fossils Discovered by Students in Museum-Aquarium Ecology Course

Sunfish, bass, northern pike, and gar, plus an as-yet unidentified turtle species, were among fossil animals recently found along the southern shore of Lake Michigan. The discoveries are helping to round out ecologists' understanding of the lake's fauna as it was some 6,000 years ago. Perhaps more important than the discoveries themselves is the fact that they were made by Chicago-area high school students, who were participants in a summer course on the ecology of Lake Michigan sponsored jointly by Field Museum and Shedd Aquarium. The students included Thomas Ardelt, Robert Bojanowski, Beth Braker, Francine Kaminsky, Bill Kiersch, Mike Lesser, Mary Millea, Andrea Moline, Adrienne St. Clair, and Sam Wengroff. Sue Teller, a graduate student at the University of Illinois, Circle Campus, is making a special investigation of the fossil discoveries.



Brooches fashioned by Navajo Indians from turquoise and coral. The settings are of sterling silver. These are among a wide selection of

hand-crafted items available at the Field Museum gift shop.



Work in Progress

We're "open for business" but it's not "business as usual," as museum employees and visitors are discovering. Nearly every day presents new evidence that Capital Campaign funds are being put to work to rehabilitate the Museum building and provide improved facilities and visitor services.

A peek over the barrier walls surrounding large areas of the north and south entrance steps reveals that the steps have disappeared. One gazes through steel beams, that once supported the steps, to the sinking concrete floor of what was once a storage area beneath the steps. The steps have been removed and carefully numbered so that they may be replaced in proper order after a new waterproof floor has been laid for them. Then the areas beneath the steps will be completely renovated to provide, at the north end of the building, administrative office areas, and, at the south, additional storage space.

Concurrent with this project, eight new emergency exits are being built in the north and south stairwells, level with the terrace surrounding the Museum. Workmen with jackhammers have had to cut through approximately two feet of brick, marble, concrete, and plaster in each location. The anticipated completion of this project and the rebuilding of the stairs will occur in July 1974.

Work necessary for the installation of a new interior freight elevator has begun, leaving the Museum without this service vehicle until approximately April 1.

In order to install the hydraulic elevator (replacing a hoist elevator), workmen will have to dig a hole approximately 90 feet beneath the floor of the Museum to accommodate the hydraulic equipment. The new elevator will serve all floors of the building. Work will soon begin on the installation of new passenger elevators; already, for this project, Hall M has been closed temporarily, and some exhibit cases have been removed from or repositioned in Halls K, 24, 13, 2, and 32.

Enclosure of the center west light well to provide additional laboratory, office, and storage space for scientific departments is expected to begin this month. For this project, Hall 18 will be closed temporarily and some exhibits in Halls 35, 36, and 38 will be disturbed.

The installation of a new security system will begin this month that will include smoke-detection devices, deterrents to theft, loudspeakers, new fire-fighting equipment, etc.

Conversion of the Museum's coal-fired

boilers to natural gas was completed in the nick of time as cold weather moved into Chicago. The conversion of the three boilers involved modernization of controls and auxiliary equipment including pumps. The boilers also have the capacity to operate on oil. Another recently completed project is the installation of the scanning electron microscope laboratory, which has been operational for several weeks.

The many additional projects envisioned will take many years to complete. Where new construction is called for, some inconvenience to staff and visitors will be experienced, but the final result will be a more enjoyable visit to the Museum, as well as more efficient operations within the building.

Before the Capital Campaign concludes next September, the Museum must raise \$2.3 million more from private sources in order to reach its \$12.5 million share of the \$25 million goal. (The other \$12.5 million is being obtained through bonding authority of the Chicago Park District.) For this, the Museum will need the assistance of all of its friends.



Photo by John Bayalis.

When the north entrance steps had been removed, Women's Board members (from left) Mrs. William L. Searle, Mrs. Rolly O. Swearingen, and Mrs. Thomas E. Donnelley II donned hard hats in order to examine the work, and took time out to have their photo taken.

CALENDAR

Exhibits

Continuing

Field Museum's Anniversary Exhibit

continues indefinitely. "A Sense of Wonder" offers thought-provoking prose and poetry associated with the physical, biological, and cultural aspects of nature; "A Sense of History" presents a graphic portrayal of the Museum's past; and "A Sense of Discovery" shows examples of research conducted by Museum scientists. Hall 3.

Film and Tour Program

Sunday, December 9

"Exploring Big Bend," free wildlife film narrated by Charles T. Hotchkiss, presented by the Illinois Audubon Society at 2:30 p.m. in the James Simpson Theatre.

December 26 through 28

Guided tours leave from the north information booth at 2 p.m.

Children's Program

Begins December 1

Winter Journey for Children, "Desert People of the Southwest," focuses on the cultures of the Native Americans. The free self-guided tour provides youngsters with a unique learning experience as they become acquainted with Museum exhibits. All boys and girls who can read and write may join in the activity. Journey sheets available at entrances. Through February 28.

Special Events

Friday, December 14

"A Christmas Afternoon at Field Museum," from 4 to 7 p.m. Tickets are \$10 for adults and \$5 for children, and are available from the Women's Board of Field Museum.

Meetings

December 11: 7:30 p.m., Nature Camera Club of Chicago.

December 11: 8:00 p.m., Chicagoland Glider Council.

December 12: 7:00 p.m., Chicago Ornithological Society.

December 12: 7:30 p.m., Windy City Grotto, National Speleological Society.

December 13: 8:00 p.m., Chicago Mountaineering Club.

Hours

9:00 a.m. to 4:00 p.m. Monday through Thursday;
9:00 a.m. to 9:00 p.m. Friday, and 9:00 a.m. to 5:00 p.m. Saturday and Sunday

Closed Christmas Day and New Year's Day.

The Museum Library is open 9:00 a.m. to 4:00 p.m., Monday through Friday. Please obtain pass at reception desk, main floor north.

Museum telephone: 922-9410

COMET KOHOUTEK (from p. 3)

moves slowly away until late February, when it will fade gradually to less than naked-eye brilliance and disappear, not to return again for more than 50,000 years. During that time it will reach 3,000 times the earth's distance from the sun—some 279 billion miles. Nevertheless, it will be well within our solar system, since the nearest star beyond the sun is 25 times more distant still.

After many such circuits of the sun it will have dissipated its substance, and be spread out along its orbit as a cloud of particles too sparse to be seen or photographed. Old comets never die, they just fade away; and if the comet's orbit happens to intersect that of earth's, it may continue to entertain us at regular intervals as a shower of meteors.

A Field Museum Membership Is Many Gifts in One

When you want to give something unusual for year-long enjoyment, remember that a Field Museum membership offers something for the whole family. To begin with, your gift recipient will receive this colorful issue of the *Bulletin* with the 1974 appointment calendar. Your gift will also include a beautiful portfolio of four-color reproductions of bird paintings. The new member, his family, and friends will enjoy unlimited free admission to the Museum at all times. Tickets to the gala Members' Nights and invitations to previews of new exhibits, such as the "Contemporary African Arts Festival" next spring, are also part of your gift. Membership also means a ten-percent discount on all purchases at the Museum's crafts and books shop. Just mail the coupon, below, or phone the Membership Department, 922-9546.

Mail coupon or facsimile to: Field Museum, Roosevelt Rd. at Lk. Shore Dr., Chicago, Ill. 60605

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Shatzel, Albert V. 1973. "Comet Kohoutek." *Field Museum of Natural History bulletin* 44(11), 3–11.

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