Family Feature: "Me and My Shadow"

Saturday and Sunday

January 25 & 26

Field Museum
of Natural History
Bulletin

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COVER

Head of Neanderthal man, sculpted by Joseph B. Krstolich, a Field Museum artist from 1941 to 1972. His five Neanderthal figures, now to be seen in one of the eight dioramas in the Hall of Prehistoric People, were completed in 1972 and replaced Neanderthal figures done four decades earlier. Krstolich's reconstructions were based on new information about the appearance of these people, who survived until 35,000 years ago. Krstolich is also to be seen on pages 15 and 18.

A101277

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Events

Chinese shadow puppets A45706

Family Feature

Me and My Shadow

Saturday and Sunday, January 25 and 26
1:00-3:00pm

SHADOW PUPPETS have been delighting audiences for more than 2,000 years. No one is sure where this art form started, but different styles of puppets can be found in China, Turkey, Indonesia, Egypt, India, and Africa. Watch a Chinese style shadow puppet play and make a puppet that you can use on our special puppet stage. "The White Snake Lady," a film of an ancient Chinese tale, will be screened for all participants.

Winter Fun 1986

DRIVE AWAY WINTER DOLDRUMS! Treat your children (or grandchildren) to weekend workshops at Field Museum. Workshops begin January 18 through February 2. Children ages 4-13 can participate in classes that range in topic from bears, birds, and arctic whales, to the fascinating cultures of the Pawnee and Hopi Indians.

Highlights of workshops being offered this year are Thunder Lizard and Tyrant King—age 4 and age 5, Indian Tea Party—ages 6-7, Dragons and Unicorns—ages 6-7 and 8-9, and Bones, Bones, Bones—ages 10-13.

Anthropologists, paleontologists, botanists, artists, and writers bring their creative energies and expertise to this winter's workshops. Advance registration required. See the *Winter Fun* brochure for a complete schedule or call 322-8854, Monday-Friday, 9:00am-4:00pm for further information.

CONTINUED →

Events

A45706

January Weekend Programs

EACH SATURDAY AND SUNDAY you are invited to explore the world of natural history at Field Museum. Free tours, demonstrations, and films related to ongoing exhibits at the Museum are designed for families and adults. Listed below are only a few of the numerous activities each weekend. Check the *Weekend Passport* upon arrival for the complete schedule and program locations. The programs are partially supported by a grant from the Illinois Arts Council.

January

5 12:30pm. *Museum Safari* (tour). Seek out big game from Africa and mummies from ancient Egypt as you travel through Field Museum exhibits.

11 11:00am. *Ancient Egypt* (tour). Explore the traditions of ancient Egypt from everyday life to myths and mummies.

12 1:00pm. *Welcome to the Field* (tour). Enjoy a sampling of our most significant exhibits as you explore the scope of Field Museum.

19 12:30pm. *Museum Safari* (tour). Seek out big game from Africa and mummies from ancient Egypt as you travel through Field Museum exhibits.

19 1:00pm. *Red Land/Black Land* (tour). Examine the geography of the Nile Valley, and its effect on the Egyptians who lived and ruled during 4,000 years of change in religion and culture.

These public programs are free with museum admission and tickets not required.

The Legacy of Carl Akeley

by David M. Walsten

In 1909 Carl Akeley finished mounting the pair of bull elephants in Stanley Field Hall which have come to be recognized as the Field Museum's emblem. He was 45 years old, had served Field Museum as chief taxidermist for nearly fourteen years, and was widely known for his innovations in taxidermy and diorama design.

Now the American Museum came to Akeley with an invitation to collect a similar elephant group for them and prepare the animals for display in their African Hall. Akeley accepted the offer, and for the remaining seventeen years of his life he served the American Museum as collector of specimens, taxidermist, and sculptor.

Though Akeley's departure must have been a difficult loss for the Field Museum, he left behind a cadre of talented protégés who were prepared to carry on his traditions. He had introduced the idea of lifelike poses for animals and had devised better techniques for mounting them and preserving their skins. He invented a so-called wax-leaf process for creating scientifically accurate, realistic foliage and had been the first to add painted backgrounds for habitat groups. Total verisimilitude was his goal, and his new dioramas were, in a word, revolutionary. In 1926, just two days before his death in the Belgian Congo, the Field Museum trustees acknowledged his contributions by electing him as a patron, an honor then accorded persons who had rendered "eminent service" to the institution.

Carl Akeley with his second wife, Mary (1926) 50865

Carl Akeley was also a highly skilled sculptor; his three bronze life-size castings of native lion hunters and their prey, completed in 1925, may be seen in the African Mammals Hall. (A duplicate set of these bronzes is on view in the American Museum of Natural History.) Among Akeley's other sculptures are a dynamic study of three elephants, "The Wounded Comrade" (1913); a life-size bust of a gorilla, "The Old Man of Mikeno" (1923); man emerging from an ape's body — representing man's creation, "Chrysalis" (1924); and a study of a bull elephant, "At Bay" (1925).

Some five decades after Akeley's departure from Field Museum, activities in taxidermy, plant modeling, and diorama construction gradually wound down, then ceased almost entirely; for by then, exhibit space in the halls and galleries was essentially filled. But during that half-century of post-Akeley activity — the golden age of the diorama—his ideals and standards prevailed. A roster of taxidermists and model-makers who served during that period includes some of the most skilled of their time. Several developed their own innovations or were able to improve on Akeley's techniques with new materials provided by the chemical and plastics industries. The 1935 International Exhibition of Taxidermic Art, sponsored by the American Association of Museums, included among eighty exhibitors the work of eight Field Museum taxidermists: C.J. Albrecht, Julius Friesser, Ashley Hine, Frank Letl, John W. Moyer, Leon Pray, Arthur G. Rueckert, and Leon L. Walters. The following pages offer glimpses of these artist-craftsmen, their colleagues, and protégés. Accompanying them are sculptors whose work has added another aesthetic dimension to the natural history exhibits.*

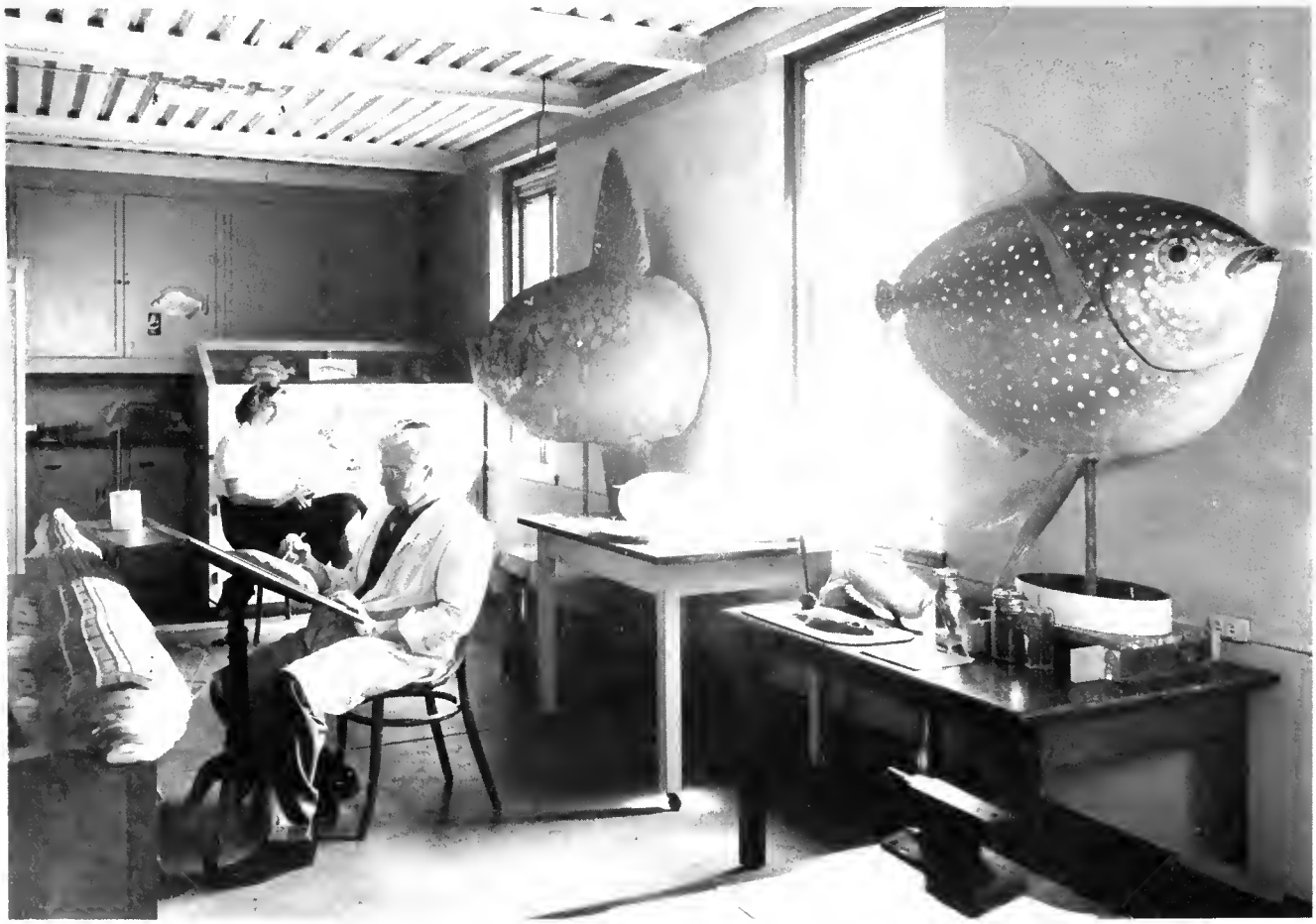
Those artists who have created the Museum's murals and painted backgrounds for dioramas will be the subject of an article in a future issue of the Bulletin.

The author thanks the following staff members for assistance in researching photos and other archival materials for this article: Marcia Carr, Security and Visitor Services; Nina Cummings, Division of Photography; Mary Ann Johnson, archivist; and Alfreida Rehling, Department of Botany.

Taxidermy, Animal Models

Bird taxidermist Ashley Hine, on the staff from 1922 to 1935, not only prepared a large number of exhibits but participated in several expeditions. Z51273

Taxidermist-sculptor-modelmaker Leon Pray (1882-1975, FM1901-1948) served on the Field Museum staff for close to half a century, beginning as a protegé of Carl Akeley. At right (1948) he works on his model of the prehistoric mesembriornis, or "terror bird." Below, he prepares models for a fish exhibit. Zoology Department Secretary Margaret J. Bauer appears to be sketching one of the fish models. Z8418, Z83025A



Sculpture

Sculptor John G. Prasuhn (1877-?, FM1920-1932) working on mannequin of Dayak warrior, ca. 1922.
A63660

Sculpture

Sculptor Frederick A. Blaschke putting finishing touches on his reconstruction of a Neolithic sun-worshipper, now on view in the Hall of Prehistoric People. Photo ca 1932. Blaschke did all the original figures in the eight dioramas of this hall. (Five Neanderthal figures were redone in 1972 after more was learned about the structure of their bodies.) Blaschke also did the mesohippus (1930) and titanothere (1931) restorations now to be seen in Dinosaur Hall dioramas. Blaschke was not a Field Museum staff member, but was commissioned to do the work at his studio in Cold Spring-on-Hudson, New York. A77746

Taxidermy

Taxidermist W. E. Eigsti (1903-?, FM1938-1946) mounts specimen of the rare South American rodent, Dinomys *(1939).* Z81118

Taxidermist Julius Friesser (1873-1958, FM1905-1948) shown at work in 1929. Friesser made a collecting trip to Mexico for the Museum in 1902, subsequently joining the staff. During his 44-year career at Field Museum he mounted more than 200 large mammals. He also collected animals during expeditions to the Olympic Mountains (elk group), Alaska (moose group), British Columbia (Rocky Mountain goats), and Guadalupe Island (sea elephants). Z80950

World-renowned Malvina Hoffman (1885-1966) was commissioned to do one of the most ambitious sculpture groups in the history of art—"The Races of Man"—for the Field Museum in the early 1930s. The Museum had at first planned to hire several sculptors to create in bronze racial types from around the world. But Hoffman convinced the Museum that several sculptors together could not produce a consistent, balanced exhibit. Her bronzes went on view in the Hall of Man (now the Hall of Past, Present, and Future) on June 6, 1933, and remained there until 1967. A selection of her finer pieces continue to be on view at various locations in the Museum today.

Above, she poses in the garden of her Paris studio with Stanley Field, president of Field Museum 1908-1964. At left, Hoffman's studio assistants Jean Limet (left) and his father are shown with studies of some of the bronzes. Both photos ca. 1932. A 80305, A82962

Taxidermy, Animal Models

A Works Progress Administration (WPA) worker, believed to be Frank Gino, preparing dodo model, ca. 1938. Four WPA taxidermists prepared bird exhibits for the Department of Zoology in that year. Z80948

Albert J. Franzen (1901-1957, FM1927-1957) served for many years as a preparator and taxidermist for the Harris Extension. Here he prepares materials for one of the department's many portable exhibits, loaned to local schools. HE78686.

Taxidermy

↑*Arthur George Rueckert (1891-1948, FM1923-1948), right, confers with Wilfred H. Osgood, former chief curator of Zoology, about construction of walrus group. A man of many talents, Rueckert began his career at Field Museum as taxidermist-preparator for the N.W. Harris Extension, working on portable exhibits. Later he painted diorama backgrounds, particularly after the death of artist Charles Abel Corwin, in 1938. Rueckert also accompanied several expeditions as collector, notably the Second Rawson-MacMillan Sub-Arctic Expedition of 1927-28.* Z83309

Arthur G. Rueckert (left) and C. John Albrecht (1891-1978, FM1926-1945), also a taxidermist. Albrecht's most notable achievement was perhaps the African Water Hole, in the African Mammals Hall. At the time of its completion (1932), it was believed to be the largest grouping of mounted animals in existence; six species and twenty-three animals are in the group. Albrecht was also accomplished as sculptor, photographer, and lecturer, and he participated in 32 collecting expeditions or field trips. Among his sculptures is that of Bushman, the gorilla, now on view at the Adventurer's Club in Chicago. Z83046

Animal and Plant Models

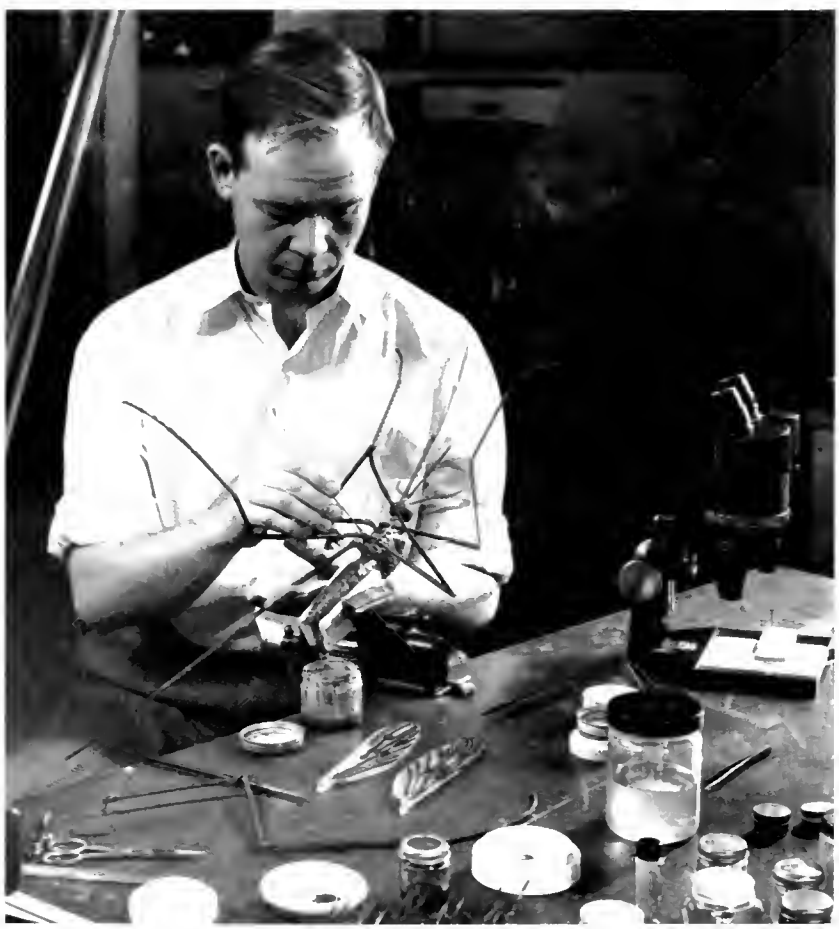
Frank Letl (1905-?, FM1938-1944), right, explains tadpole exhibit to group of school children (1941). Letl worked principally on animal and plant models and on other diorama accessories. Z81598

Frank C. Wonder (1903-1963, FM1926-1954) prepares tree model for tapir exhibit. Wonder assisted with a great many large mammal preparations and participated as a collector on a number of expeditions, notably the Crane Pacific Expedition of 1928-29

Z86414

Taxidermy, Animal Models

Taxidermists Leon L. Walters (1888-1956 , FM 1938-1954), left, and Edgar G. Laybourne (1888-?, FM1938-1946) prepare whale exhibit, now to be seen in Hall of Sea Mammals. Z8065



James E. Trott (FM1946-1949) prepares model for mosquito exhibit. Z9435

Taxidermy

The "Rebirth" of Bushman. Following the death of Bushman, Lincoln Park Zoo's celebrated gorilla, Field Museum artists and taxidermists set out to immortalize him in a lifelike restoration. In 1951, sculptor Joseph B. Krstolich, and taxidermists Leon L. Walters and Frank C. Wonder accomplished this with supreme skill. Krstolich (upper left) sculpts the basic body frame and pose; Wonder (upper right) removes plaster cast; Walters' (lower left) works on head; Wonder and Walters (lower right) do finishing touches. No technique other than Walters' own cellulose acetate method could have made the hairless face, with its translucent fleshy skin, so lifelike; the gorilla's arresting expression of repose and almost arrogant indifference to his multitude of viewers has been brilliantly captured. Z84927 Z84989 Z84949 Z85005

Taxidermy

← *Leon L. Walters (left) and Ronald J. "Pete" Lambert (FM1946-1980) with newly completed cellulose acetate model of Galapagos turtle (1947), prepared by Walters and Julius Friesser. This model was based on a live specimen obtained on Indefatigable Island, Galapagos Group, by the Crane Pacific Expedition in 1929* Z83408

John W. Moyer (FM1929-1970), left, shown with WPA assistant in 1938 as they prepare large bird mount. Moyer was a taxidermist from 1929 until 1947 (with time out for military service); later he was in charge of the Museum's Motion Picture Division. Z80981

Taxidermy, Animal Models

Pete Lambert (left) and taxidermist Carl W. Cotton (1918-1971, FM1947-1971) collaborate on exhibit screen (1957). Z86855

Taxidermy, Animal Models

Taxidermist Carl W. Cotton (1918-1971, FM1947-1971) puts final touches on monkey.

Sculptor Joseph B. Krstolich (FM1941-1972) preparing model for "This Is a Mammal" screen. (Krstolich's work may also be seen on the front cover). Z87629

Animal Models

Maidi Wiebe Liebhardt (FM1951-1962), shown in 1958 applying color to a shark model, prepared exhibits for the Department of Geology. G82021

Tibor Perenyi (FM1962-1978), of the Department of Exhibition, shown in 1964 as he prepared model of the so-called "Tully Monster." Now retired, he lives in Vienna, Austria, where he continues his activities as sculptor. (Perenyi's bust of the late Eugene S. Richardson, Jr., former curator of invertebrate paleontology, appeared in the May, 1983 Bulletin, p. 6.) G82829

† *Taxidermist Ernst A. Gramatzki (FM1972-1973) works on jaguar, the last large mammal to be mounted at Field Museum.*

• *Richard Berndt, Field Museum's last full-time taxidermist (1972-1976), prepares a bird group.*

Sculpture

Martin Wanserski (FM1972-1975), Department of Exhibition sculptor, works on figures of man and lion for the exhibit "Man in His Environment," opened in 1975.

Robin Faulkner, who joined the Department of Exhibition as an artist in 1985, poses with her new sculpture. The piece is now on view in an exhibit depicting field work in the coastal deserts of Peru. The exhibit is in the second-floor hall, "Past, Present and Future." Photo by Sonia Fonseca. B84175

Plant Models

Milton Copulos (1881-1965, FM1910-1952) shown with his plant model creations. The upper left photo is ca. 1920, the others ca. 1950.

Plant Models

David Henner (1898-1925, FM1917-1925) shown working on plant model in 1924. The 1925 Annual Report *observed: "(A model) of the Victoria regia was the last of the many creditable pieces of work produced by David Henner, before his untimely death by accidental drowning while swimming at the Dunes. . . ."* N50956

John R. Millar (1899-1977, FM1918-1968) was hired as a preparator in the Department of Botany. Shortly thereafter he spent several months at the USDA Plant Introduction Laboratory in Miami, Florida, where he collected material and made models for the Stanley Field Collection of Plant Models. He later accompanied expeditions to British Guiana (1922), Brazil (1926), and Nova Scotia's Bay of Fundy (1938). In 1937 Millar became curator of the N.W Harris Public School Extension. In 1946 he was named deputy director of the Museum and in 1960 became chief curator of Botany. As well as model-making, Millar participated in the creation of dioramas, notably that of intertidal vegetation (case 78), in Plants of the World Hall, which drew upon his observations on the Nova Scotia coast. N78541

Plant Models

Frank Boryca (FM1947-1972), left, and Emil Sella (1898-1965, FM1938-1961) shown in 1947 while making plastic leaf models with hydraulic press. Large leaves, such as those of cabbage, were made of wax in plaster molds. Smaller leaves were made of plastic in metal dies. Boryca was a preparator in the Department of Botany, Sella's position was curator of exhibits for Botany. B80328

Emil Sella, in 1950s, working on model of welwitschia, plant from southwestern Africa. B80027B

Plant Models

Right and below: Samuel H. Grove, Jr. (FM1947-1975) began as an assistant in the Plant Reproduction Laboratory; later he was an artist for the Department of Exhibition.

TOURS FOR MEMBERS

Yucatan Discovery Cruise

January 19-26

A team of specialists will take you through the incredible ruins of the Yucatan, built by the highly cultured Mayan peoples between the 3rd and 13th centuries A.D. cruising aboard the Greek-staffed *Stella Solaris*, we will visit Playa Del Carmen, Uxmal, Tulum, the famed ceremonial city of Chichen Itza, and the newly excavated Coba. There will be plenty of swimming, snorkeling, and sunbathing in Xel-Ha, Akumal Beach, and Cozumel. In addition, we will visit the modern resort of Cancun, the island of Grand Cayman and Montego Bay. Alan Kolata, assistant professor of South American archaeology at University of Illinois at Chicago brings thorough knowledge and tremendous enthusiasm to the tour. He has done extensive field work and lectured widely on South America and Mesoamerica and looks forward to being your leader on this exciting adventure.

Baja California

March 8-23

Circumnavigating the Baja peninsula aboard the *Pacific Northwest Explorer* is an experience you won't want to miss. Dr. Robert K. Johnson, curator of Fishes at Field Museum and other naturalists will enrich your visit to the breeding lagoons of gray whales, fin, humpback, sei, and the largest of all—blue whales. In addition to some of the best whale-spotting in the world, you'll get a close-up view of colonies of northern elephant seal, schools of dolphins, myriad birds and fish, strange endemic plants, and very lovely scenery.

The Art and Culture of Indonesia— A Voyage to the Islands of the Java Sea

March 21-April 8

Composed of thousands of islands forming a vast archipelago, Indonesia is an ancient land of gentle peoples, rich and varied cultural traditions, and tropical landscapes of unsurpassed beauty. With its panoply of religions, art forms, rituals, and dances found nowhere else in the world, Indonesia confronts the visitor with a fascinating past; its history, myth, and legend are often inseparable. On an itinerary which has been carefully planned to include well-known sites as well as remote, verdant isles, we will travel aboard the ship *Illiria* to destinations of immense beauty.

New Zealand Cultural Expedition

April 14—May 4
Price: $4,675
(double occupancy)

The Maori people of New Zealand welcome you to their country and their hearts with this unique opportunity to live and share with them in a rich cultural adventure. This is the first year American tour groups have been allowed to stay with the Maori in their traditional meeting houses, where we will be ceremonially initiated into Maori society. This once-in-a-lifetime chance is offered to Field Museum members in conjunction with our forthcoming exhibit, "Te Maori: Maori Art From New Zealand Collections," and is led by Dr. John Terrell, curator of oceanic archaeology and ethnology at Field Museum.

The Great Silk Route of China

May 21—June 15
$4,550

Field Museum is offering an exciting new itinerary for The People's Republic of China, featuring some areas of interest new to the world traveller and to those who have visited China previously. Our flight from Chicago is direct to Tokyo then on to Beijing. After several days there, viewing such marvels as the Forbidden City and the 98-acre Tien An Men Square, we go on to Urumqi, Dunhuang, Lanzhou, Xian, Shanghai, and Guilin. Xian is of particular interest to archaeology buffs for here we find the vast life-size terra cotta army discovered in 1974. We return to the U.S. via Hong Kong. Phillip H. Woodruff, Ph.D. candidate in Chinese history at the University of Chicago will be tour leader. He is fluent in Chinese and thoroughly knowledgeable in Chinese culture past and present. He has taught and lived in China and is currently an associate professor in the Department of History at the University of Virginia. He has led several previous Field Museum tours to China and looks forward to having you along in 1986.

The Classical Mediterranean

May 24—June 8

What better way to sail the blue Mediterranean than aboard the legendary *Sea Cloud*? The largest private sailing ship ever built, she retains the elegance of the past while offering contemporary comfort. In addition to many other ports, we visit Rome, Pompeii, Tunis, Malta, Naxos, Cephalonia, and Athens. The program will be enhanced by a series of educational lectures and discussions presented by accompanying faculty, offering insight into the art, architecture, archaeology, and culture of the civilizations that once thrived on these shores. Richard De Puma, a Field Museum research associate in the Department of Anthropology and associate professor at the University of Iowa's School of Art and Art History will be tour escort. He earned his Ph.D. in classical archaeology and knows intimately the ancient sites to be visited on this tour. Dr. De Puma has worked extensively in archaeological research and excavations of ancient Mediterranean cultures, has written numerous articles and books, been involved in several museum exhibitions of classical antiquities and has recently attended two international congresses on Etruscan archaeology and culture. He is an exceptional lecturer and leader.

Alaska

July 2-16
$4,885

Visit Alaska in summer! Explore magnificent waterways and vast parklands abundant with many species of birds. At Sitka, a marine wildlife rafting trip gets you started on this spectacular ornithological tour. From Juneau, a trip on the Mendenhall River offers unusual wetland viewing. From Anchorage one easily reaches Potter Marsh Bird Refuge and the Eagle River. Denali National Park (formerly called McKinley National Park) and the Glacier Bay cruise are special highlights. We conclude our trip with three days on St. George Island. Few people have visited this island, which boasts spectacular birding. Early enrollment is suggested. $50 will secure your reservation.

North Cape and Spitzbergen

Sailing Date: June 28
Hamburg to Hamburg—14 days
Aboard the Five Star Cunard/NAC *Vistafjord* luxury liner
Field Museum leader: Dr. Bertram G. Woodland

TOURS FOR MEMBERS

English Homes and Country Tour

July 1-15
Price $2,725
(double occupancy)

The countryside of southeastern England is a sea of rolling green hills patchworked with living hedgerows and dotted with woolly sheep. Charming thatched villages nestled in the downs and lush royal gardens easily complement the medieval towns with their ancient cathedrals and the quaint southern cities with their cobbled streets and bustling pubs. The average tourist experiences no more of these than can be viewed in a cursory tour, but Field Museum is offering a marvelous opportunity for the discriminating traveler to live with English people in their homes, and to experience English country life as they do. Hosts and hostesses include baronets, generals, doctors, company directors, members of Parliament, and landowners. Their homes range from mansions to more modest, yet extremely comfortable country cottages. Accommodations include use of a private bathroom.

In addition to a local guide, a scholar from the Field Museum will make this a rich and unusual adventure. Dr. Peter Crane was born and raised in England, getting his Ph.D. in botany at the University of Reading. He is an associate curator in the Department of Geology at Field Museum and was recognized as one of ten "Outstanding Young Citizens" by the Chicago Junior Association of Commerce and Industry in 1985. He is excited about this unusual travel opportunity in his native country and invites you to join him and his countrymen in an exploration of English Homes and Country.

Itinerary:

Tues. July 1. Depart Chicago O'Hare for Heathrow.

Wed. July 2. Arrive Heathrow. Met by tour director; board luxury coach for drive to Canterbury. Meet hostesses and drive to their homes to unpack and freshen up before lunch. At leisure for the rest of the day. In the evening dinner with hostesses.

Thurs. July 3. Canterbury. A day in and around Canterbury. First a tour of the cathedral personally introduced by a canon from the cathedral staff, followed by a wander in Canterbury before lunch. After lunch further time to wander in Canterbury before visiting the village of Fordwich, which has the oldest town hall in England. Dinner in a private house.

Fri. July 4. South Kent. Drive south to the Cinque Port of Rye with its steep cobbled streets and period houses, and the world famous Mermaid Pub. A short drive to Bodiam Castle, built in 1386 to defend the Rother Valley from incursions by the French, followed by lunch at the Castle Pub. Another short drive to Great Dixter, a house built about 1450 (not long after Chaucer) and which now has a lovely garden containing a wide variety of unusual and interesting plants. Dinner in a private house.

Sat. July 5. Mid-Kent. After breakfast a leisurely drive to Leeds Castle for a private tour of what was described by Lord Conway as the "loveliest castle in the world." On through typical Kent countryside to Sissinghurst Castle, with its well-known and very beautiful garden. After lunch in the Castle restaurant, a short drive to Godinton Park for a private visit to this mansion with its fine Stuart panelling, carving, and magnificent furniture and porcelain. Dinner with hostesses.

Sun. July 6. Travel To Cambridge. Goodbye to the Canterbury hostesses. A short drive to the great Norman cathedral at Rochester in the heart of Dickens country where those who wish may attend a service. Then by tunnel under the River Thames northward into the county of Essex for lunch in a Tudor pub. After lunch a drive through the changing East Anglian countryside to meet and dine with Cambridge hostesses.

Mon. July 7. Suffolk. A day in Suffolk countryside immortalized by artist John Constable. First to Newmarket, home of the Sport of Kings, and center of the racing industry for a private tour of the Gallops, Tattersalls Selling Ring and the Jockey Club for sherry. Lunch in Newmarket before driving to the medieval town of Bury St. Edmunds with its beautiful cathedral. In the late afternoon a short drive to Lavenham with time to explore the Guildhall dating from the 1520s, and the most splendid of all "Wool" churches before dining in one of the oldest buildings in Lavenham, the famous Swan Hotel.

Tues. July 8. Cambridge. A day in and around Cambridge, first visiting historic colleges and churches including Kings College Chapel, followed by a visit to the American Military Cemetery at Madingley which commemorates those Americans who died in northwest Europe in World War II. Lunch at a private house close to Cambridge. The afternoon in Cambridge exploring the city before dining with hostesses.

Wed. July 9. Travel To Chichester. After bidding farewell to Cambridge hostessses a drive south to West Sussex bypassing London to the west, and stopping for a pub lunch on the way. In the afternoon visit the Royal Horticultural Society Gardens at Wisley. These world-famous gardens contain an extraordinary collection of plants, flowers, trees, and shrubs, and attract visits by horticulturists from all over the world. A further journey to meet and later dine with hostesses.

Thurs. July 10. Chichester. First to Bosham to visit Trinity Church of King Canute fame before going to Chichester for a stroll through the Pallants to the Hospice of St. Mary, then lunch in the Dolphin and Anchor. A Private tour of the Cathedral and free time to explore before having supper at the Festival Theatre Restaurant and attending a performance at the theater.

Fri. July 11. Winchester. A drive west, skirting Portsmouth and Southampton, to Broadlands, home of the late Lord Mountbatten. A short drive to Winchester for lunch in the Wessex Hotel before visiting the cathedral and wandering in its environs. Return to Chichester through the rolling countryside of West Sussex. Dinner with Hostesses.

Sat. July 12. Mid-Sussex. Visit Boxgrove Priory which dates from the 12th century. A short drive to the thatched village of Amberley which nestles at the foot of the Downs. A pub lunch. Then to Petworth, a magnificent late 17th-century house which includes among its treasures works by Van Dyck and Turner, and a Grinling Gibbons room. A private dinner at Goodwood House followed by a tour of this historic home of the Dukes of Richmond and Gordon.

Sun. July 13. Travel to London. Goodbye to Chichester hostesses, and drive to London for an orientation tour through the West End and City before arriving at the Mandeville Hotel and settling in there before lunch. Free afternoon and evening.

Mon. July 14. London. Free day and evening in London. The booklet on London in the personal folders given to each guest on arrival in England lists places of interest, how to get there and times of opening. A private tour of the Palace of Westminster, provided the Houses of Parliament are not in recess, will be arranged for those who wish.

Tues. July 15. Tour Ends. Those returning home will be escorted to London Heathrow Airport by our tour director. Arrive Chicago O'Hare.

Grand Canyon Adventures

August 13-22
August 22-31

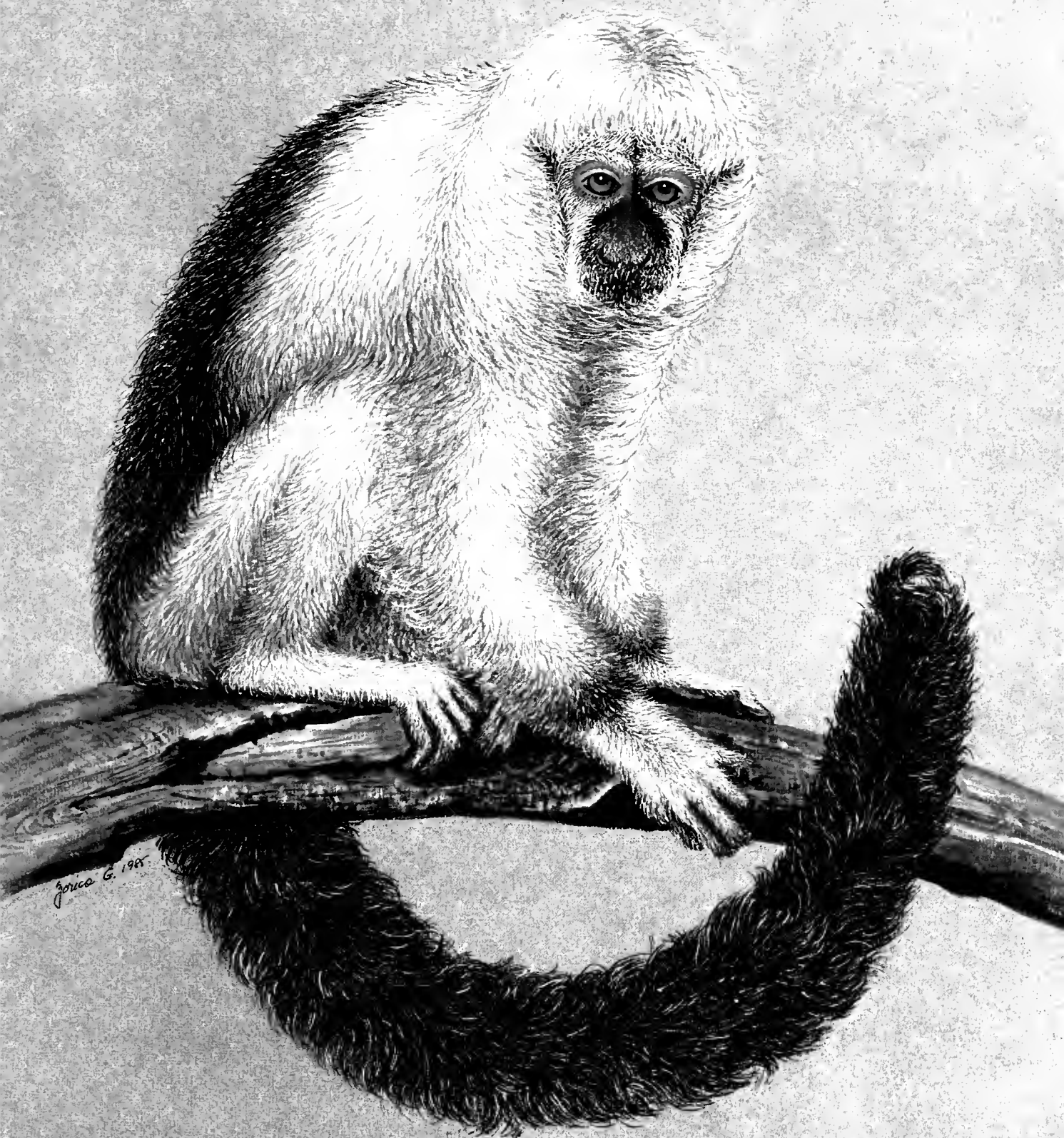
Field Museum Tours is offering two trips to the Grand Canyon in 1986. The first, August 13-22, is a geology study trip hiking down the north rim of the canyon, rafting for four days along the bottom and hiking back up the south rim. The second, August 22-31, is a rafting trip along the entire 300-mile length of the canyon by two motorized rubber rafts. Dr. Matthew H. Nitecki, curator of fossil invertebrates leads both. A deposit of $50 per person will hold your space.

For further information or to be placed on our mailing list, call or write Dorothy Roder, Tours Manager, Field Museum, Roosevelt Rd. at Lake Shore Dr., Chicago, IL 60605. Phone: 322-8862.

Field Museum of Natural History
Membership Department
Roosevelt Road at Lake Shore Drive
Chicago, IL 60605-2499

FIELD MUSEUM OF NATURAL HISTORY BULLETIN

February 1986



"Sweet Saturday Night"

Brooklyn Academy of Music's Company of Dancers and Musicians
Perform Dances from Black America's Back Roads,
City Streets and Ballrooms
Saturday, February 22, 8:00 pm

Field Museum
of Natural History
Bulletin

Published by
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Halley Hot Line

A new Comet Halley Hot Line, to keep fans of the returning comet on top of its whereabouts, went into service on December 15.

The new high-volume commercial service allows several thousand callers at the same time to hear a recorded message about the comet. The information is provided by the United States Naval Observatory in Washington.

For people anywhere in the United States, Canada, Puerto Rico and the Virgin Islands, calls to the telephone number, (900) 410-8766, cost 50 cents for the first minute and 35 cents a minute after that.

The recorded messages will be updated regularly, talking about the whereabouts of the comet—making its first return visit since 1910—and telling callers how to locate it in the night sky. The hotline is expected to remain in service until April 15.

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COVER

The piebald saki, Pithecia albicans *Gray, of the upper Amazonian region of Brazil, painted by Zorica Dabich, Field Museum staff illustrator, for* Living New World Monkeys (Platyrrhini), *Volume 2, by Curator Emeritus Philip Hershkovitz. See pages 24-25.*

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Events

Sweet Saturday Night

Saturday, February 22, 8:00pm
James Simpson Theatre

IT'S PARTY TIME!—with the hit production of the Brooklyn Academy of Music's Dance Black America Festival. You are invited to join in the fun for the sweetest and hottest nights of them all. Sweet Saturday Night erupts on the stage, explodes in the aisles and flows out into the streets of Chicago in a celebration of 300 years of the dances that grew up in the back roads, city streets, and ballroom dance floors of Black America.

FROM TRADITIONAL AFRICAN DANCES, the delicate moves of the turn-of-the-century Cakewalk and the elegance of exhibition ballroom dancing, to the lascivious moves of Earl "Snakehips" Tucker, tap dancing, and the death-defying acrobatics of the Lindy Hop—it's all here—the Black Bottom, Juba, Twist, Hustle, Electric Boogie and more! Witness also, excerpts from "Fat Tuesday," a high ceremony of candles, sequins, deities, and drums, and a New Orleans funeral marching band. Sweet Saturday Night's company of 19 dancers and musicians keeps you in a spin from start to finish.

Tickets: $12:00 (Members: $10.00). Fees are nonrefundable. Please use coupon to order tickets. Seating is general admission. Theatre doors open one hour prior to performance. Public Programs information: (312)322-8854.

Two hours of sheer joy and a show that would be sweet any night of the week!

CONTINUED →

Events

February Weekend Programs

EACH SATURDAY AND SUNDAY you are invited to explore the world of natural history at Field Museum. Free tours, demonstrations, and films related to ongoing exhibits at the Museum are designed for families and adults. Listed below are only a few of the numerous activities each weekend. Check the *Weekend Passport* upon arrival for the complete schedule and program locations. The programs are partially supported by a grant from the Illinois Arts Council.

February

1 11:00am. *Ancient Egypt* (tour). Explore the traditions of ancient Egypt from everyday life to myths and mummies.

8 1:30pm. *Tibet Today* (slide lecture). Visit Lhasa and other towns now open to tourists.

16 12:00noon. *Life in Ancient Egypt* (tour). Focus on the objects and practices which illustrate ancient life in the Nile Valley.

22 12:30pm. *Traditional China: The Jades* (tour). Examine the imagery, history, and lifestyles represented by Chinese jades and other masterworks.

23 12:30pm. *Chinese Ceramic Traditions* (tour). Explore 6,000 years of ceramic art from our permanent exhibit.

These public programs are free with museum admission and tickets are not required.

Family Feature

Winter's For the Birds
Saturday and Sunday, Feb. 1 and 2,
1:00–3:00pm

LOOK! UP IN THE SKY! Is it a cardinal? Is it a starling? No! It's a black-capped chickadee! Not all birds fly south for the winter, and the ones that stay can use your help. Make a pine cone bird feeder for Chicago area winter residents. Do a quiz in our Bird Habitats exhibit and find out how our flying friends survive the season. Get a Field Museum Field Guide to Area Birds to help you identify what you see. Take home a bird mobile to have a bird of your own in flight year round.

This feature is free with museum admission and no tickets are required.

Registration

Be sure to complete all requested information on the ticket application. If your request is received less than one week before a program, tickets will be held in your name at the West Entrance box office. Please make checks payable to Field Museum. Tickets will be mailed upon receipt of check. Refunds will be made only if the program is sold out.

☐ Member ☐ Nonmember

American Express/Visa/MasterCard

Card Number

Signature Expiration Date

Return complete ticket application with a self-addressed stamped envelope to:

Field Museum of Natural History
Public Programs: Department of Education
Roosevelt Roat at Lake Shore Drive
Chicago, IL 60605-2497

Name

Address

City State Zip

Telephone: Daytime Evening

Sweet Saturday Night

Member Tickets # Requested	Nonmember Tickets # Requested	Total Tickets Requested	Amount

FIELD BRIEFS

"Plant Lady" Retires

Field Museum's volunteer "Plant Lady," Helen Ruch, has retired after nearly ten years of faithfully tending the Museum's many living plants throughout the large building.

Helen Ruch came to Field Museum as a volunteer in 1976 after a career as an administrative assistant at Michael Reese Hospital and Medical Center. The tender loving care which she lavished on the Museum's plants for those ten years will be sorely missed, and the staff wishes her well as she joins her family in Oregon.

Distinguished Peruvian Botanist Visits Field Museum

Abundio Sagástegui Alva, of the Universidad Nacional de Trujillo, Trujillo, Peru, recently completed a two-month study visit to Field Museum's Department of Botany. His trip was funded in part by a Science in Developing Countries Program Grant, awarded by the National Science Foundation to Field Museum. Dr. Sagástegui is a Field Museum research associate as well as a contributor to the Museum's *Flora of Peru* program. During his stay, he worked closely with Associate Curator Michael O. Dillon on several research projects involving Peruvian plants.

A leading Peruvian botanist, Dr. Sagástegui has trained a generation of students now occupying positions in Peruvian universities. The Peruvian government recently honored him for his many years of service in higher education. He has authored many scientific papers and books, and is currently chairman of the Botany Section and head of the Herbarium Truxillense in Trujillo. During his U.S. visit, Dr. Sagástegui also traveled to the Missouri Botanical Garden, in St. Louis, which contributed toward his sponsorship.

Energy Reduction Award

On December 4 the Field Museum was recipient of the 1985 "Energy Achievement Award" from the Illinois Chapter of ASHRAE (American Society of Heating, Refrigerating, and Air Conditioning Engineers). The award was for a project initiated in 1982 as part of the Museum's energy management and utilization program.

With the implementation of this program, the Museum has been able to reduce the overall use of energy, staying somewhat even with the increased cost of utilities.

Shown holding the award is Norman P. Radtke, Field Museum's physical plant administrator. With him is Lee Woods, president of the Illinois Chapter of ASHRAE.

Michael Dillon Promoted

Michael O. Dillon, who joined Field Museum in 1978, has been promoted to associate curator of Botany. His research activities have been focused on the sunflower family (Asteraceae) and the flora of Peru. Dillon was responsible for the descriptive labelling in the *Plants of the World* exhibit hall, reopened in 1983, and his field work has been the subject of a recently completed section in the *Bringing the World to Chicago* exhibit.

Dillon's present research includes a study of the unusual *lomas* formations in the Pacific coast deserts of Peru and northern Chile. He is coordinating final treatments for the *Flora of Peru* project. His identification of specimens belonging to the very large sunflower family has made him many friends and brought much new material to the Museum.

John Terrell's New Book on Pacific Islands Prehistory

Field Museum's curator of Oceanic archaeology and ethnology, John Terrell, is the author of *Prehistory in the Pacific Islands: A Study of Variation in Language, Customs and Human Biology,* published this month by Cambridge University Press.

How, asks Dr. Terrell in this richly-illustrated and original book, can we best account for the remarkable diversity of the Pacific Islanders in biology, language, and custom? Traditionally scholars have thought in terms of a neat racial division between Polynesians, Micronesians, Melanesians, Australians, and Southeast Asians: peoples allegedly differing in physical appearance, temperament, achievements, and perhaps even intelligence. However, Terrell shows that such simple divisions do not fit the known facts and represent little better than a crude, static snapshot of human diversity.

In a fresh and stimulating study that brings to bear a wide range of data drawn from anthropology, achaeology, biogeography, human ecology, and linguistics, he poses a whole series of unfolding and interlinked questions about prehistoric life in the Pacific that effectively unite the human imagination with logical and empirical methods of evaluation.

The 300-page book is illustrated with 19 halftones and 77 diagrams. At the time this issue of the *Bulletin* went to press, it was expected that the new book would be available at the Field Museum Store in February. Price: $44.50 (10% discount for Members).

Herbarium Gift

A collection of 4,625 mounted herbarium specimens were recently given by the Program for Collaborative Research in the Pharmaceutical Sciences (PCRPS) of the College of Pharmacy, University of Illinois at Chicago—Health Sciences Center, to Field Museum's John G. Searle Herbarium. At the university the collection was used mainly in teaching, and as a repository of voucher specimens of plant samples used for phytochemical and pharmacological investigations. The PCRPS collections include several important early herbaria from the Chicago region, notably the Bastin Herbarium of more than 900 specimens collected between 1870 and 1890.

A special interest of Dr. Charles F. Millspaugh (a trained physician), the organizer and first head of the Botany Department, was medicinal plants, an interest which has been perpetuated at the Museum since its founding. It is for this reason that many of the PCRPS specimens documenting pharmacological studies are especially welcome.

The transfer of the collections to the Museum will make them more readily available to researchers worldwide, and ensure their proper curation. The specimens will be available to students and researchers, both at the Museum and at other institutions, through an active loan program.

Art Objects as Taonga

Spiritual Values and Power in Maori Art

by Sidney Moko Mead

Photos by Athol McCredie,
courtesy the American Federation of Arts
and Henry N. Abrams, Inc.

The Te Maori exhibition has not only made us more aware of the artworks of the Maori people of New Zealand; it has also helped focus intellectual enquiry upon understanding this art in its own terms. It is now inappropriate to apply Western concepts of analysis and appreciation to an art tradition that is plainly not Western and does not spring from a Western cultural context. Rather, the new emphasis is upon trying to understand Maori art from the standpoint of the culture and of the people whose art it is. This means, in effect, beginning with such basic notions as the word taonga, which is the Maori label for art object, artwork, or artifact.

←*1. War God (Uenukutuwhatu)*
Wood, 267 cm. (8 ft. 9 in.) high
Found at Lake Ngaroto, 1906
Waikato tribes
Te Tipunga period (1200-1500)
Te Awamutu Museum

2. Lintel (Pare)→
Wood, shell, 235 cm. (7 ft. 8 in.) wide
Patetonga
Ngati Tamatera tribe
Te Huringa 1 period (1800—present)
Aukland Institute and Museum

Sidney Moko Mead is professor of Maori, Victoria University of Wellington.

A dictionary definition of the word *taonga* will fail to reveal its full significance. *A Dictionary of the Maori Language*, by Herbert W. Williams,* tells us that it means "property" or "anything highly prized." Then, in one of the examples of how the word is used in a sentence, we are told that "posture dancing is a big taonga." *(Ko te tangata maori taonga nui tenei, te haka, mo te manuhiri.)* This important word appears in the Maori text of the Treaty of Waitangi (1840), where it has a range of meanings. In the English text of the treaty it is supposed to mean "property," but to Maori people it means a great deal more than material possessions. When we speak of *nga taonga tuku iho*, that is, of prized possessions handed down by the ancestors, we include highly prized segments of our culture such as dancing (mentioned above), the language, the oral literature, the arts, and the traditions and our history.

The word stands for material objects such as art objects and heirlooms as well as for the immaterial elements of culture such as language, the traditions and history, and associations with *tapu* (sacredness) and *mana* (prestige). While the word *taonga* includes within its orbit art objects as well as the performing arts, it is not confined to them alone. However, here I want to discuss the concept of *taonga* in relation to the sort of art objects exhibited in New York (1984), in St. Louis and San Francisco (1985), and in Chicago at the Field Museum (1986). I want to confine my comments to the category known to the Maori as *taonga whakairo*, that is, to art objects. For my purposes here I will accept as art objects any of the pieces that were selected by "experts" from the United States and New Zealand for inclusion in the "Te Maori" Exhibition.

These objects are expertly crafted, each has a history and in this sense a life of its own; and each has, as a vital part of it, a story consisting of many words. The words might be those spoken at the ceremony in which the object was presented to its new owner—a ceremony of separation from the artist and of formally severing his "ownership" and influence over the object. Or the words might be those spoken by the artist and others while the object was being created. Yet again the words might be the story of how the object was passed down the generations from one owner to the next and so on. Or how the object was found after being lost for a long time. These words are part of what makes a lump of wood or stone an art object—a *taonga*—and a thing of cultural significance.

In the production stage the artist builds words into the object he carves, and usually after a lot of reflection and discussion with other people. The words are not actually written into the wood but rather are summarized and represented by well-understood motifs and forms such that the viewer can "read" the artistic message. An example can be seen in the Patetonga door lintel from the Auckland Museum. Carved round about 1840-50, this is a superbly composed lintel which retells a powerful origin myth (fig. 2).

This is the story of the culture-hero Maui, who sought immortality for mankind. What he thought he would do was take death out of the hands of the Goddess of Death, Hine-nui-te-po. He had just obtained fire for man by taking it away from the Goddess of Fire, Mahuika. Now he was going to find the very source of life, gain control of that and so give people the power to live forever. The Goddess of Death is shown in the center of the lintel and she can be seen lying down with

*Published by Government Printer, Wellington, New Zealand, 1957.

her legs apart. Her eyes were said to be of greenstone and they flashed on the edge of the sky. Here her eyes are of shell and they are open and flashing. To help him carry out this important task, Maui persuaded some birds to go with him. What he planned to do was reverse the process of birth and enter the womb of the goddess while she was asleep, for surely the source of life was there. He made the birds promise that when he crawled in, they were on no account to laugh at him, no matter what they thought of his actions.

Well, he began his entry. He wriggled and wriggled and soon his head was in but then the birds could contain themselves no longer and they burst out laughing and twittering at Maui. This woke up the goddess and she got such a fright that she closed her open mouth and brought her great thighs together, crushing Maui to death. That was how Maui died. He failed in his very important quest, and as a consequence man must tease the tail of death as shown in the terminal motifs on the lintel. In other lintels man as represented by the *manaia* is locked in mouth-to-mouth combat with the symbol of death, the lizard, or *tuatara*.

It is obvious in this case that the words built into the lintel through the code of wood carving gives meaning to the object. And it is because this message is readily understood that the door lintel is sometimes treated like a corpse. In the case of the carved house, Rongokarae, opened April 15, 1901 and built by the Ngati Rongo hapu of Tauarau marae, Ruatoki, its door lintel was carved in another village some considerable distance away. The *tohunga* (priest) of Te Whaiti, a man named Te Tuhi, carved it in about 1889, then carried it on horseback to Ruatoki. Wherever the Te Tuhi stopped, the door lintel was greeted and wept over as

MEMBERS' PREVIEW OF

Te Maori: Maori Art from New Zealand Collections

Friday, March 7

5:00 pm to 9:00 pm

At 6:00, Dr. John Terrell, Field Museum's curator of Oceanic archaeology and ethnology and exhibit curator of "Te Maori," will introduce Dr. Sidney Moko Mead, professor of Maori, Victoria University at Wellington. There will be a performance of traditional Maori songs and dance in Stanley Field Hall following the introduction and Dr. Mead's opening remarks. Light refreshments will be served.

"Te Maori" is the first international exhibition devoted exclusively to Maori art and culture. These 173 remarkable heirlooms of traditional art combine major sculptures and carvings in wood, stone, jade, bone, ivory, and shell, dating from AD 1000 to 1800. Among the works presented from more than 30 Maori tribes are monumental architectural sculptures, elaborate canoe carvings and equipment, weapons, tools, musical instruments, mortuary carvings, and objects of personal adornment.

The exhibit catalog, *Te Maori: Maori Art from New Zealand Collections*, edited by Dr. Mead, and *Prehistory in the Pacific Islands*, by Dr. Terrell, will be available for purchase.

Special arrangements for handicapped persons can be made by calling 922-9410, ext 453. The CTA #146 Marine/Michigan bus services Field Museum. Call CTA (836-7000) for the evening schedule.

"Te Maori: Maori Art from New Zealand Collections" was organized by the American Federation of Arts in association with the New Zealand government, the Maori people, and the New Zealand leading museums. Made possible by a grant from Mobil. Supported by the National Endowment for Arts, the National Endowment for the Humanities, an indemnity from the Federal Council on the Arts and Humanities, Air New Zealand, and the National Patrons of the American Federation of Arts.

Please join us for a very special evening

though it was indeed a corpse. The biggest ceremony was when he finally arrived at Tauarau. There the lintel was wept over and the theme of its composition confirmed. But as it was an important part of the decorative scheme of the ancestral house it was also seen as being the ancestor.

When the ridgepole, or *taahuhu*, for this same house was pulled across the river, the men on the receiving side performed a posture dance to welcome the backbone of their founding ancestor, Rongokarae. In this instance the world *taahuhu* was interpreted as the backbone not only of the house being built but also of the ancestor himself, of a man who was a great leader and a great carver in his day (fig. 3).

A ridgepole has a clear function in holding a house together. Other poles are also important; for example, the central heart post and the front pole. On many of these supporting posts an ancestor figure is carved. The figure is not simply a carved effigy of such and such an ancestor but will be seen as being that ancestor. Thus, in a carved meetinghouse people will seek out an ancestor with whom they have some relationship and they will sit or sleep near that ancestor.

One of my colleagues tells the story of how two people sitting in front of a meetinghouse disagreed over some names in a genealogy and when they began questioning each other's right to argue for the respective version, one of them moved to the front pole and hugged the carved figure at its base and said, "This is my ancestor, where is yours?" This gesture won the argument on that occasion. Plainly, the representation on the post was an ancestor of some status.

In yet another case, when the house Te Hono-ki-Rarotonga (The Connection with Rarotonga) was being built in the early 1930s, the local chief objected to one of his ancestors being given a prominent penis, so he chopped off the offending organ. His impulsive act offended the team of carvers and they threatened to walk off the job. After some talk back and forth the carvers agreed to finish the house, but the chief began to suffer personal discomfort afterwards. In this case, the *mana* (prestige) of the carvers was questioned and their *tapu* put at risk. It is not permissible for the patron to deface the work of his carvers or to question their ability. That would be regarded as an insult.

Carvers had certain rights which had to be protected. One unusual and interesting case of carvers' rights was associated with the house Hotunui (1878), now in the Auckland Museum. While this house was

3. Ridgepole of a chief's house, Tahuhu
Wood, 239 cm. (7 ft. 10 in.) high
Bay of Plenty
Ngati Awa tribe
Te Huringa 1 period (1800—present)
Auckland Institute and Museum

4. Side post. Poupou; Wood, 126 cm. (49 5/8 in.) high; Opotiki; Whakatohea tribe; Te Huringa period (1800—present); National Museum of New Zealand, Wellington

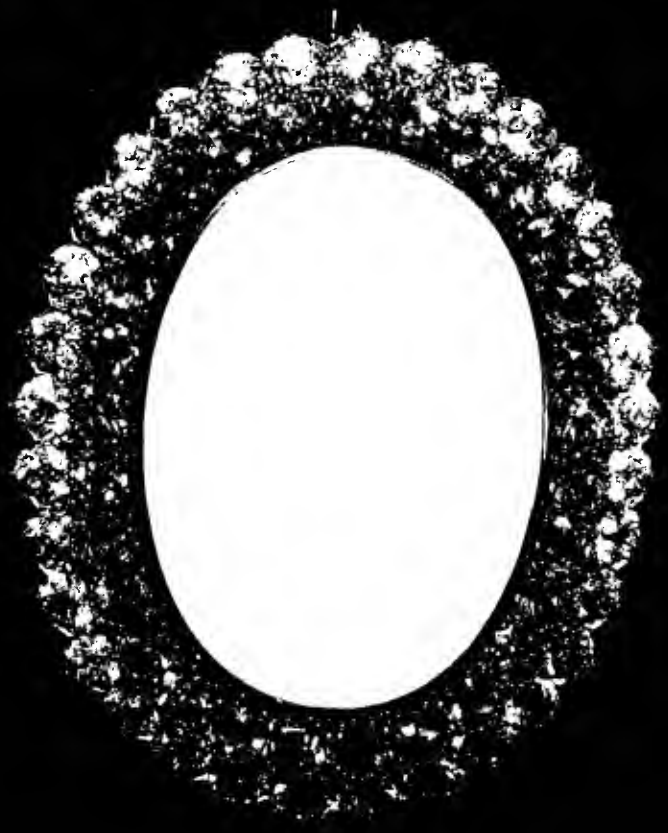
being carved in Hauraki, several of the carvers took sick and died. Mereana Mokomoko, for whom the house was being built, and her fellow tribesmen, the carvers, believed an error was the cause of her trouble: the chips from the chisel of Mereana's father, Apanui Hamaiwaho, had been used in a cooking fire. This was a terrible thing to do. To correct it, a ritual fire of carving chips was lit and two sweet potatoes were cooked in it. After they were cooked Mereana in her capacity as chief's daughter was asked to eat them. Reporting this event later she said, "I trembled with fear lest death should come to me also!" But the old men reassured her that she had the power to remove the evil spell which was destroying the carvers. She ate the sweet potato and eventually, the house, Hotunui, was completed.

Mistakes were regarded very seriously in the art world of the Maori. There are famous instances in the literature. A rafter painter at Te Whaiti made a mistake in the painting of a certain pattern and this was noted by the tohunga who opened the house. He prophesied an early death for the artist, and according to the people he was dead within a year. A truly tragic case was that of the chief Te Waru of Ngati Whaoa of Te Arawa who one day walked casually into the carving shed smoking his pipe. He had forgotten to leave his pipe and tobacco outside. In those days food of any sort was not permitted—tobacco was cooked food. As a result of this error the carvers quit work and so Te Waru had to try and finish the house by himself. It is reported that he lost three wives and two children before he finally gave up and sold his unfinished dream to a European dealer named Charles Nelson. Nelson then hired carvers to complete the house, which he erected at Rotorua.

In March 1900 Charles Nelson persuaded the people to give his house the full measure of traditional opening ceremonials, somewhat like the rituals for the opening of "Te Maori." This resulted in one of the strangest happenings of the Maori world in which a Pakeha (European) was demanding and getting the ritual ceremonies for his house which he planned to sell soon afterwards. No one can do that sort of thing nowadays. What he was doing was using the people to "authenticate" his house so he could get a good price for it. The house is Rauru, which is now in Germany. As it happened he exceeded the requirements of protocol by arranging for two tohunga (ritual experts), instead of one, to open the house. Nelson was thus the cause of committing another grave error and as a result the second tohunga who performed the opening ceremonies died within eight days of the event. My relative, the first tohunga, died over a year later. The chief, Te Waru, who committed the original error, lived to a ripe old age, but he was burned to death in his hut at Paeroa. The house that he attempted to build when he was still a young man was in honor of "the beautiful wife of his

Continued on p. 19

A Recent Bequest



The opal, garnet, and diamond brooch shown here has been placed on permanent exhibit in the new Grainger Hall of Gems.

This exquisite antique brooch was a bequest from the late Mrs. Clarence (Mathilde) Wiley, formerly of 1320 North State Street, Chicago. The brooch had been handed down for generations in her family, and on the reverse is engraved "Mathilde Elock, 1887-1904."

The brooch is platinum and 14 karat yellow gold with an oval-shape opal measuring 31.5 × 22.5 mm. The opal is bordered first with 29 rare green garnets, each .12 ct, thence with 33 round old mine-cut diamonds, each .15 ct.

Field Museum is deeply appreciative of this bequest, and invites other Members to donate heirlooms and collections by way of will. Another recent bequest was a collection of fine crystal, which is used in the Founders' Room. The collection was the bequest of the late Harold E. Christensen, for some years chief buyer for the fine crystal department of Marshall Field's. Many Members make monetary gifts by will, also; these funds are placed in the Endowment, where the monetary gift becomes as perpetual as heirloom gifts. The Museum's Planned Giving Office, (312) 322-8858, welcomes inquiries. All bequests to this natural history museum become as perpetual as natural history itself.

Colombian Emeralds

The World's Finest

by Peter C. Keller

Few gemstones on the world market today provide the aura of adventure and intrigue, wealth and beauty that we find in the emerald. Indeed, the mystique of these gemstones dates from the early days of the Roman Empire, when stones from the now long-lost Cleopatra mines in Egypt were first worn as jewelry. Although the Egyptian mines may have provided the Western world with the first such emeralds, and such gems were later found in Russia, Austria, and Brazil, the finest emeralds are of Colombian origin.

The history of the Colombian emerald mines is a checkered one, beginning with the Spanish conquerors' cruel enslavement of local Indians to work the deposits—one of the factors leading to a rapid decimation of the Indian population. Even in recent times, violence and murder was so prevalent at Muzo, Colombia's major mine, that it was forced to close down in the early 1970s.

By the time the Spanish arrived in South and Central America in the early 1500s, large quantities of emeralds were already in use by the natives of Peru, Ecuador, Colombia, and Mexico, suggesting that the mining of these gemstones and their use as a trade item had been going on for some time. Montesinos, a priest in Peru between 1628 and 1642, wrote that emeralds were among the spoils of Sinchi Roca when that Inca leader conquered Cuzco, Ecuador, in A.D. 1100. The Spaniards found emeralds being used as human adornment and as sacrificial offerings in

◊ *Some 15,000* guaqueros *(literally "treasure hunters") are found every day searching river beds for emeralds washed down from Colombia's main emerald-mining area, Muzo. Their lifestyle is much like that of our own Forty-Niners during the California Gold Rush.*

Peter C. Keller, Ph.D. is associate director, Public Programs, of the Los Angeles County Museum of Natural History.

The 217.8-ct Mogul Emerald (front and back) is a fine example of early Colombian stones treasured by the Mogul nobility in India. Alan Caplan collection, New York. Photography by Harold and Erica Van Pelt.

rituals such as the famous El Dorado ceremony at Lake Guatavita, just northeast of Bogotá.

According to historical accounts, Francisco Pizarro, who conquered Peru, sent four chests of emeralds from that country to the king of Spain in 1533. Father Joseph de Acosta wrote that two chests of emeralds were on his ship when he sailed from Peru to Europe in 1587. Today, many of the older museum collections in Europe contain emeralds labeled as Peruvian in origin, though these are all undoubtedly from Colombia.

As a matter of course, the Spanish began searching for the source of these fine emeralds, which were vastly superior to those they knew from Egypt and Austria. Unable to locate a source in Peru, the Spanish under Gonzalo Jimanez de Quesada began looking in Colombia. There, Quesada first came upon emeralds at Turqmeque, in what is now Colombia's department of Boyaca, in 1537, prompting him to send a Captain Valenzuala to locate the exact source. Valenzuala succeeded in finding what is now the Chivor mine, 75 km northeast of Bogotá. Already well developed by the Chibcha Indians, the mine came to be named Chivor after a nearby valley. The Spanish took over the deposit and began extracting emeralds, using slave labor.

The huge output of fine gemstones from Chivor that soon resulted was followed, not surprisingly, by a drop in emerald prices on the European market; so new markets were sought. The Mogul nobility of India were especially eager for the large, fine, Colombian crystals, and Spain began exporting large quantities of rough Colombian crystals to India, where many were beautifully carved. These were worn by the Mogul nobility, usually as clothing adornments.

In 1739, when the Persians sacked Delhi, a large percentage of the carved Mogul emeralds were lost to the conquerors and subsequently taken to Persia. Some idea of the vast wealth that was lost to the Persians could be gained (until recent years) by viewing the crown jewels of Iran, which included many of these Mogul emeralds. Experts who examined more than 1,000 of them reported that most were larger than 10 ct and some exceeded 100 ct.

One of the finest examples of these stones to be found in private hands today is known simply as the Mogul Emerald. This roughly rectangular carved slab is approximately 2″ × 1½″ × ⅜″ in size and weighs 217.8 ct. One side is carved with the floral motif that was popular with Mogul craftsmen; the other side contains an Islamic prayer inscribed in beautiful Arabic calligraphy. The inscription includes the date A.D. 1695, placing the stone in the reign of the Mogul emperor Aurangzeb.

Many of the best Colombian emeralds of the late

sixteenth century found their way to the royal courts of Europe. A very fine example of such is the Smithsonian's "Spanish Inquisition Necklace," a 300-year-old piece consisting of 15 major emeralds and more than 360 diamonds. The emeralds are in the form of cylindrical and hexagonal beads not unlike those found in pre-Colombian artifacts, and it is quite possible that these emeralds were taken from the Indians who had used them in jewelry for their own royalty. The necklace's centerpiece is a 24 × 15 mm emerald bead of the finest quality, flanked by 14 fine, but smaller emeralds. The style of drilling in the 15 stones is like that of pre-Colombian Indian craftsmen.

The 300-year-old "Spanish Inquisition" necklace contains 15 emerald beads and more than 360 diamonds. Smithsonian collection.

During the sixteenth and into the seventeenth and even eighteenth centuries, many of the finest Colombian emeralds were used in major pieces of religious art, in Colombia as well as in Spain. Perhaps the most spectacular of these is the Custodia de San Ignacio, which is today in the care of Bogotá Jesuits. This 19-inch-high monstrance is nicknamed *La Lechuga* ("lettuce"), because the approximately 1,480 uniformly fine emeralds give the piece a green appearance. The most important single stone in *La Lechuga* is a cabochon (a polished but unfaceted stone) of some 50 ct, so mounted that it may be viewed from either side, forming a beautiful green window.

An exceptionally fine 1"-high emerald crystal in typical matrix from Chivor, Colombia. Photo by Van Pelt.

In 1592, the first recorded grant for working the Chivor deposits was given to Francisco Maldonado de Mendoza by the president of the new kingdom of Granada. To protect Indian mine workers against cruel treatment, the president issued a decree in the following year. This was followed in 1602 by orders from Spain's Phillip III, further enforcing the law, but by then the labor force had already been seriously reduced. The loss of workers, together with stricter regulation of mining procedures, resulted in a sharp drop in emerald production. In 1650 in the Muzo district mines were declared property of the crown, and production declined even further. By 1675 the Chivor mine was abandoned, and for the next 200 years its location remained a mystery. Muzo was worked off and on until 1871, when the government declared it the National Emerald Domain. Then, production all but ceased, and lawlessness prevailed, a situation that has ameliorated only recently.

Soon after Muzo was placed under government control, Chivor was rediscovered, thanks to a description of the location written almost 300 years earlier. In 1888, Colombian mining engineer Don Francisco Restrepo found an early seventeenth-century manuscript containing the description in a Dominican convent in Quito, Ecuador. Written by Fray Martin de Aguado, it described the Chivor mine as the only place in the Andes from which one could see through a mountain pass to the plains of the Orinoco. Following this lead, Restrepo located the legendary mine in 1896. Legal problems with the government hampered Restrepo's early mining activities, but his subsequent partnership with German mining engineer Fritz Klein coincided with the lifting of government restrictions and improved production. When World War I broke out, however, Klein returned to Germany. Restrepo died at Chivor and, with Germany's defeat, Klein lost all right to the mine as the consequence of alien property legislation. In 1919 Chivor came into private hands when it was purchased by the Colombian Emerald Syndicate, Ltd., an American firm. Since then, Chivor has changed hands frequently, with varying fortunes, and been managed by such mining engineer notables as Peter W. Rainier (author of *Green Fire*, 1942) and Willis Bronkie. Today the Chivor mines are in the hands of the Quintero family.

Chivor emeralds are generally considered inferior to those from Muzo, but they may have fewer flaws and are possibly much "brighter." Chivor emeralds are also not known for great size, but a noteworthy exception to this is the 632 ct Patricia Emerald, the largest known crystal from Chivor. Discovered in 1920, the Patricia was sold the following year for $60,000. Its whereabouts remained unknown until the early 1950s, when it was given anonymously to the American Museum of Natural History.

In 1953, a new mine was discovered at Gachalá, 8 km southwest of Chivor, when a woodcutter's mule allegedly uncovered an emerald-bearing rock. Although Gachalá has produced only off and on since its discovery, an 848 ct crystal, generally considered one of the finest in existence, was found there in 1967. The 5-cm hexagonal prism, known simply as the

The most famous Chivor emerald is the 632-ct "Patricia," now housed in the American Museum of Natural History, New York.

Gachalá Emerald, is now at the Smithsonian.

During the first half of the twentieth century, the Colombian government was unable to mine profitably at Muzo, and in 1946 the government yielded management of the mine to the Banco de la Republica, the national bank, which supervised it until 1969 with better results. During this period, several emeralds of major importance were found, and these were placed in the bank's vault in Bogotá, where they remain. They include five crystals weighing 220.0; 1,020.5; 1,482.5; 1,759.0; and 1,795.85 ct each. Two of these—the 1,020.5 ct and 1,759.0 ct crystals—are of exceptional quality. The latter stone, measuring 50 × 45 × 89mm, may be the largest very fine rough emerald crystal in the world. Certainly, these five together are comparable to any emerald crystal collection known.

For the most part, the five crystals are simple hexagonal prisms. The 1,795.85 ct and the 1,482.5 ct crystals are definitely blue-green, a characteristic generally associated with Chivor emeralds though all five in the bank collection are reportedly from Muzo. They have interesting rectangular etch faces, minor calcite inclusions, and some associated pyrite.

While under the bank's management, Muzo also produced the largest Colombian emerald crystal in the world—the 7,025 ct Emilia crystal from the Las Cruces mine. It is of poorer quality, however, than those in the bank's collection. The crystal has been displayed at various expositions around the world since its discovery in 1969 by a private mining concern, but its present whereabouts is unknown.

Today, the Muzo and Chivor districts remain Colombia's chief emerald producers. The Muzo district, 360 square kilometers (139 sq. miles) in area, and at an elevation of about 600 m, is 105 km north of Bogotá in the valley of the Rio Itoco, a tributary of the Rio Minero. The main mines in the Muzo district include the Tequendama, Santa Barbara, El Chulo, Coscuez, and Peñas Blancas.

The Chivor district, some 75 km northeast of Bogotá, is in exceedingly rugged country where the Rio Rucio and Rio Sinai join to form the Rio Guavio. The Chivor mine is at an elevation of about 2,300 m, and just 2 km to the east, in sight of the mine, the Rio Guavio, at an elevation of only 700 m, slices through a ridge that rises even higher than the mine. In addition to the Chivor mine, the Chivor district includes the Buenavista mine, just south of Chivor, and the Las Vegas de San Juan mine, commonly known as the Gachalá mine, some 8 km to the southwest. Colombia's only privately owned emerald mine, Chivor has produced moderate but consistent quantities of fine emeralds in recent years. In the past year, the Buenavista mine has been particularly active.

Much of the recent excitement in the Colombia emerald mining area has been at Muzo, a government-

The most spectacular of five crystals housed in the Banco de la Republica in Bogotá, Colombia, is this crystal which weighs 1795.85 ct. Photo by Harold and Erica Van Pelt.

Looking east over the Chivor emerald mine, 75 km northeast of Bogotá.

Looking north over the Muzo mines, about 105 km north of Bogotá.

Guaqueros *working the gravels of the Rio Itoco, below the Muzo mining area.*

already noted, was long known for mismanagement and violence. In 1977 the government awarded five-year leases for the Muzo mines to three private companies. Under the new lease arrangement, Muzo is more productive than at any other time in its 400-year history. In 1978, just a year after the Muzo leasing began, Colombia's total emerald exports jumped to $40 million, compared to $2 million in 1973.

Unfortunately, five-year leases encourage lessees to mine as rapidly as possible, and their methods are not as considerate of resources and the environment as they should be. When the author visited Muzo in 1979 and again in 1980, the main area was being worked harshly, with bulldozers and dynamite—methods that had been avoided in the past because of the fragility of emerald crystals. After an area has been dynamited, bulldozers scrape away the overburden, exposing white calcite veins where the emeralds are to be found. Teams of laborers then work the veins with pick and shovel. The emeralds they find are placed in canvas bags, then are sorted by the mine lessees each evening. Afterward, the parcels of sorted stones are taken to Bogotá for further grading and marketing.

Because the main area is being stripped away with so little care, a significant portion of the potential emerald production is lost to the gravels of the Rio Itoco, and each day finds the riverbed worked by some 15,000 *guaqueros* (independent miners, directly translated as "treasure hunters"), whose lifestyle recalls that of our own Forty-Niners during the California Gold Rush. **FM**

youth." He tried his best to build a house that would serve as a fitting honor to her.

Stories such as that of the chief, Te Waru, emphasize the fact that a *taonga* such as a carved house or even the decorated parts of a house are much more than what the eyes see (fig. 4). The carvers who created them were committed to their construction in a way that is difficult for modern carvers to appreciate. Their reputations, their *mana* (prestige, power), and indeed their lives were invested in the objects they created. When the carvers die on the job and when the officiating tohunga risk their lives to create a valuable object for the community, the result cannot be an ordinary art object. We are looking at different values and at different attitudes toward valuable objects. These are the attitudes associated with the concept of *taonga*.

One cannot and should not be aloof and detached from a *taonga*. Rather, the viewer should display a commitment to it. The nature of the commitment can be contemplated and understood by thinking about the way in which Maori people act towards valuable art objects. For example, the *taonga* brought to the United States have been put through several rituals before their arrival. One such ritual occurred before leaving the museum where the objects were kept and another before they were finally enclosed in coffinlike boxes for consignment on an airplane. There were important ritual ceremonies to open Te Maori at the Metropolitan, at the St. Louis Art Museum, and at the de Young Museum in San Francisco. There will also be such a ceremony at the Field Museum.

On such ritual occasions one is able to think of the carvers who made these objects, in some cases many centuries ago. The collection of objects forces one to think of our ancestors who have all passed on, of their joys and pains, of their dreams for us, of their successes and their failures. Above all we acknowledge them for giving us something to behold with our eyes and our minds, something to call our own and be proud to show the world and something which helps to give us, the people of today, an identity.

Some objects are invested with great *mana*. Objects of this sort are named, and by being named they reflect the importance given to them by the people. The adze associated with the Aotea canoe and named a Tawhiorangi is a highly *tapu taonga* which has great *mana*. This *taonga* was lost for a very long period of time, from the time of the land wars until very recently when it was found in the ground. Its discovery caused great excitement, and as a *taonga* of great antiquity it was wept over and then put away for safekeeping. It is said that people who mistreat this *taonga* or who touch it without good cause are "hurt" by it. The person who found it is said to be suffering as a result of handling the adze.

5. Pendant. Hei-tiki Rutataewhenga
Greenstone, 12 cm. (4 3/4 in.) high
Tuparoa
Ngati Porou tribe
Te Tipunga period (1200-1500)
Hawke's Bay Art Gallery and Museum, Napier

Generally speaking, the greater the value of the object to the widest number of people in a tribe, the more *mana-tapu* is associated with it. Raymond Firth, in his book *Economics of the New Zealand Maori,** discussed this notion under the category of magic. The *tapu* made the object very sacred, and its *mana* gave it a force that had the power to hurt or to do things that are not associated in other cultures with art objects. It is certainly not present in all art objects in the Maori world. Among the items in "Te Maori" are several that are believed to have a power that is a consequence of their great *mana-tapu*. The representation of the god

**Published by Government Printer, Wellington, New Zealand, 1959.*

Uenuku from Waikato is such an object (fig. 1). Shaped somewhat like certain pieces from Hawaii or Tahiti, Uenuku is a highly abstract composition that might represent fingers pointing to the sacred god above, Rangi-nui-e-tu-nei (The Sky Who Stands Above Us). It is perhaps poetic justice that a great deal of discussion had to take place before Uenuku was allowed to leave New Zealand. Certainly, American viewers have recognized the power of Uenuku.

In the book for the exhibition, *Te Maori: Maori Art from New Zealand Collections*, Anne Salmond** wrote about Amiria Stirling's neck ornament, a *tiki* called Mahu-tai-te-rangi. This *tiki* has the power to move of its own accord, and there was a famous incident on national television when the *tiki* was seen to turn itself so that its back was to the camera! The explanation offered by Amiria's husband was that the *tiki* did not like what she was saying on television (fig. 5). Salmond mentioned a second example. This time the object was a wooden weapon, a *taiaha* which belonged to the famous warrior of Taranaki, Titokowaru. Titokowaru fought the British and roundly defeated them on two occasions, but he lost the last battle. Titokowaru's *taiaha*, or wooden staff, was called Te Porohanga and it was believed that the war god Uenuku entered it when summoned to do so. Titokowaru would hold the weapon horizontally between his thumb and forefinger and the *taiaha* would then turn and point towards the fighting unit who had to go and fight that day. There was certainly power in that weapon.

Another sort of power is that which causes observers to "feel" and "notice" the presence of great *mana* in an object and, in noticing, respond in some way. It is as though the ancestors are "willing" the observers to respect the power before them and so acknowledge it. This sort of quality is referred to as *ihi* (power), *wehi* (fear), and *wana* (authority). Usually all three words are necessary to describe this quality which has the power to make people respond in some way. The response might be for one's body hair to stand on end and for the skin to tingle. Or it might be that one begins to twitch or one might weep. All of these responses are perfectly normal to the Maori people and we will not stop anybody from weeping over a *taonga* or make them feel guilty because their skin is tingling.

When Princess Te Puea first saw the metal bird, called the Korotangi, she stood in silence and wept quietly for some moments. The bird was believed to have come in her tribal canoe, Tainui, but the ethnologists are puzzled by its presence in New Zealand because its associations are not Polynesian. Whatever the origin of the Korotangi, Princess Te Puea reacted to it and felt its imminent power. Whether she felt the power of her own people or of some alien people we do not know. What is interesting is that the quality of *ihi*, *wehi*, and *wana*, which is recognized by the Maori people, might actually be felt by people of other cultures even when they do not have a theory to account for it. For the Maori, good art has *ihi*, *wehi*, and *wana*. Without this quality we do not have a *taonga whakairo* (art object). All we might have is a stick or a stone that is decorated.

I mentioned earlier that a *taonga* has life of its own in the sense of having a history. It might have as well a *mauri*, or life principle. People have a *mauri*, as do things such as forests and land. *Mauri*, like *hau*, refers to the vitality of growing things, to their fertility and productivity. In this sense an art object cannot be compared to man, vegetation, and land. Nonetheless, some of my colleagues in the Maori world, for example, John Rangihau,* believe that inanimate things such as art do have a *mauri*. What an art object might also have is an *iho*, which means "heart, inside, kernel, a pith" or that which gives the object its power and its strength as a work of art. However, when a named art object is given a personality and power to react like a human being, then it is also thought to possess a *mauri*. This *mauri* is not an inherent part of the material object, but rather is part of its spoken life, its life in words, its history, and its *tapu-mana*. As these qualities are given by people, they can also be removed by them when, say, the object has "died" and is to be replaced. The *mauri* is part of the cultural existence of the object rather than of its natural existence as wood, bone, or stone (fig. 6).

The qualities which I have referred to, namely *ihi*, *wehi*, and *wana*, *mauri*, *hau*, and *iho* all point to the fact of Maori art objects possessing what we might call spiritual quality or spirituality which, in turn, point to something we might call a religious response among the people. It is time to ask about the source of the spiritual quality. Where does it come from? Why is there a sacred quality to art objects?

There is but one source (which I explain below), but there are several channels to the source. The first has to do with the origin myth of woodcarving. According to the beliefs of some of the Eastern tribes, woodcarving was obtained from the realm of the Sea God Tangaroa. Tangaroa was one of the sons of the Sky-Father, Rangi, and of the Earth-Mother, Papatuanuku. Ruatepupuke went down into Tangaroa's kingdom and there found the carved model of a meetinghouse. After some adventures there Ruatepupeke returned to earth with some of the house carvings and these became the model for the great carver, Hingangaroa, of the East Coast. This was how the godly gift of carving was transferred out of the hands of the

**From "Nga Huarahi O Te Ao Maori, Pathways in the Maori World," p. 109.*

* *In Te Ao Hurihuri:* The World Moves On *(Aspects of Maoritanga), Hicks Smith & Sons Ltd, Wellington, 1957.*

6. Figure from palisade. Pou
Wood, 177 cm. (69 7/8 in.) high
Opotiki
Whatkatohea tribe
Te Huringa 1 period (1800—present)
Aukland Institute and Museum

7. Gateway figure
Wood. 196 cm. (6 ft. 5 1/8 in.) high
Lake Rotorua, Te Ngae
Arawa tribe (Ngati Whatkaue
Te Huringa 1 period (1800—present)
Aukland Institute and Museum.
Gift of Justice Gillies

Sea God, Tangaroa, and delivered into those of ordinary people. Although woodcarving is now an activity of ordinary people, its divine and godly source is never really forgotten. A carver has to respect the god who gave us carving.

Next, there is a genealogical channel to the carver or to the owners. Genealogies of high-ranking persons of great *mana-tapu* begin from the gods Rangi and Papa. Ultimately they are the source of everything—of *tapu* and of *mana* and of art. Carvers and owners associated with a particular object give to it, by contagion, a measure of their personal *mana-tapu*. The more they have, the more the object will collect and so become sacred. Other people who know of these associations cannot ignore them. They are a part of the story, of the *korero* (words), of the *taonga*.

Another channel is in the materials used. If *wood* is used the source is Tane, the God of the Forest, of trees of life. If it is whalebone, the source is Tangaroa again—whales belong to his domain. If bird bones are used the source is Tane and if the bones of men are used the source is Tumatauenga. On the other hand, if the carver turns to stone such as greenstone there is one god, for obsidian another and for basalt yet another. In fact, wherever the carver turns he confronts a world divided into godly zones and for which proper rituals are required of him.

Thus, in the whole activity of carving, from the cutting down of the trees to the completion of the work and to its presentation to the public the spiritual aspect is present. Even today carvers tend to regard their art seriously. This same attitude of seriousness pervades all domains of carving, regardless of material. One of the basic forms used by Maori artists is the human form, the image of man, expressed in a number of ways on all sorts of objects. Very often the image is that of a named ancestor and the very name given to such an image elevates it and gives it *mana*. Ancestors are highly valued so that choosing a name can become a very delicate matter that affects a large number of people. Arguments can result in political factions developing and these might become divisive in a community.

For a significant number of people the ancestors are part of the living family. They are talked to and about as though they passed away only yesterday. Identities are defined in terms of them, for who are we without them! Through them we are assigned a tribe and a *hapu* (sub-tribe), sometimes several. But the important thing is that without them we are faceless. To be just a New Zealander, which is what many politicians advocate today, is to be nobody. In the Maori world you must have a tribal identity and you must know your *hapu*. Without these you are an orphan crying in a social wilderness (fig. 7).

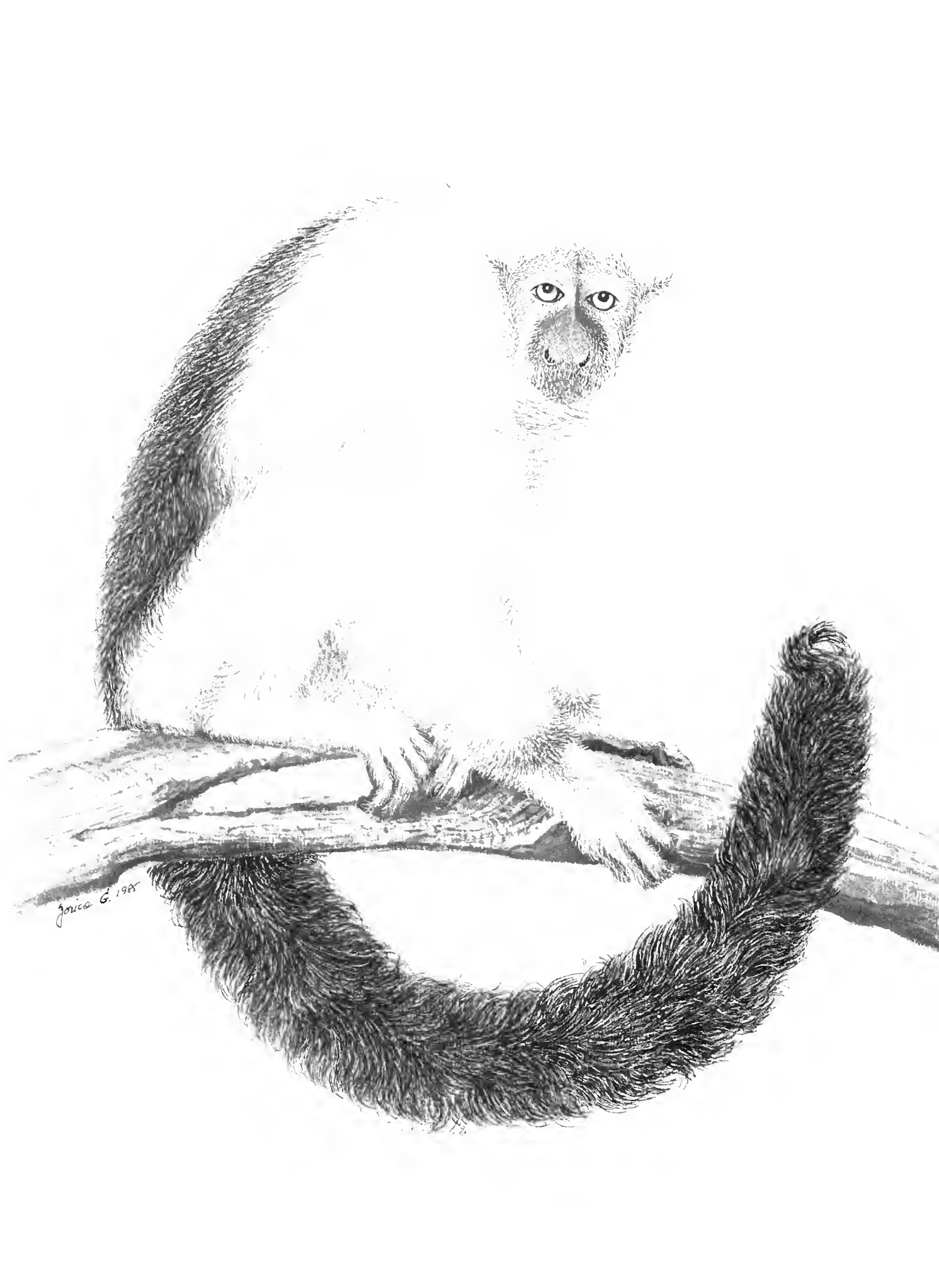
It will be obvious to most observers that ancestors are intertwined in the visual arts; they are the inspiration for much artistic endeavor. There is no art without them. Because they are the inspiration and the theme of a great deal of woodcarving there are consequences. One is that the art keeps their memory alive by presenting images of them for everyday contemplation. Two, the ancestors bring the art close to the people. Maori art is not just for intellectual contemplation and cannot be just that. It belongs to the people, and the ancestors provide two sorts of link: between art and people and at a deeper level between the gods and the people. Because of these associations artists must treat art seriously; there are too many possibilities of hurting people for it to be regarded in any other way.

Conclusion

I set out to explain the Maori concept of *taonga*, particularly of *taonga whakairo*, or art object. In doing so I have focused upon people and how they behave towards *taonga* rather than the other way around. The behavior provides clues and evidence of beliefs and attitudes, and these combined make up the philosophy of the people. They are, in fact, part of what we could call Maori aesthetics, which we might define as the theory underlying the arts of the Maori and the philosophy of the mind and the emotions in relation to them.

The concept of *taonga* is central to an understanding of Maori aesthetics. Here we are not dealing with a theory of the beautiful for contemplation by sensitive, beautiful people. Rather, we have to think of power in art objects, of artistry of such magnificence that it elicits awe in the beholder and moves the self to respond. We have to envisage an art system that demands a close attachment of artists and public to it. This attachment is assured because (1) one's identity as a Maori is reflected by and incorporated in the arts; (2) ancestors are the main concern of the artists, and the ancestors they portray provide the bond that links the public strongly, positively, and surely to the arts; (3) the ancestors help the public define their place in the world.

The arts are seen in a positive light and everything about them is good; they are full of beauty and tears, they link us to our ancestors and ultimately to the source of everything that is Maori, namely to Rangi, the Sky Father, above, and to Papatuanuku, the Earth Mother, below. The arts reflect our culture and our humanity. In one real sense they give us dignity as people and make us more human and more cultured than would otherwise be the case. The *taonga* in "Te Maori" elevate us, they raise our self-esteem, they enlarge us as a people, they give us more space in the world and they make us intensely proud of the achievements of our ancestors.FM


Jorica G. 1985

The Piebald Saki

by Philip Hershkovitz
Curator Emeritus of Mammals

The piebald saki, one of the rarest of monkeys, lives in a small remote part of Brazil. The animal, the size of a large house cat, has never been photographed or seen alive outside its country and nothing is known of its habits in the wild.

The first specimen made known to science was sent from Brazil to the British Museum (Natural History) in London about 1850, by Henry Walter Bates (1825-1892), and described as *Pithecia albicans* in 1860 by John Edward Gray.

Bates, the English naturalist who conceived the theory of mimicry in animal form and color during his travels in Brazil from 1848 to 1859, first saw the piebald saki alive in Ega (now Tefé), a town on the banks of the upper Amazon River. It was the pet of a friend and neighbor. As told by Bates in *The Naturalist on the Amazonas* (1863, vol 2, p. 314), the *parauacú*, as the monkey is called by natives, "became so tame in the course of a few weeks that it followed [its master] about the streets like a dog. My friend was a tailor, and the little pet used to spend the greater part of the day seated on his shoulder, whilst he was at work on his board. It showed, nevertheless, great dislike to strangers, and was not on good terms with any other member of my friend's household than himself. I saw no monkey that showed so strong a personal attachment as this gentle, timid, silent little creature.... It is not wanting, however, in intelligence as well as moral goodness, proof of which was furnished one day by an act of our little pet. My neighbour had quitted his house in the morning without taking *Parauacú* with him, and the little creature having missed its friend, and concluded, as it seemed, that he would be sure to come to me, both being in the habit of paying me a daily visit together, came straight to my dwelling, taking a short cut over gardens, trees, and thickets, instead of going the roundabout way of the street. It had never done this before, and we knew the route it had taken only from a neighbour having watched its movements. On arriving at my house and not finding its master, it climbed to the top of my table and sat with an air of quiet resignation waiting for him. Shortly afterwards my friend entered, and the gladdened pet then jumped to its usual perch on his shoulders."

Nothing more has been reported on the habits or nature of the monkey.

The *Bulletin* cover illustration was modelled on a museum preserved specimen and photographs of living animals of closely related species of the genus *Pithecia*. The figure is one of a series being executed by Staff Illustrator Zorica Dabich for the second volume of my *Living New World Monkeys (Platyrrhini)*. The first volume was published in 1977 by the University of Chicago Press. The scientific work is supported by a grant from the National Institutes of Health and the illustrations, in part, by the Barbara E. Brown Fund for Mammal Research.

The piebald saki, Pithecia albicans, *painted by Zorica Dabich.*

TOURS FOR MEMBERS

For reservations, call or write Dorothy Roder (322-8862), Tours Manager, Field Museum, Roosevelt Rd. at Lake Shore Dr., Chicago, Il 60605

M.V. Pacific Northwest Explorer

Baja California

March 8-23

Circumnavigating the Baja peninsula aboard the *Pacific Northwest Explorer* is an experience you won't want to miss. Dr. Robert K. Johnson, curator of Fishes at Field Museum and other naturalists will enrich your visit to the breeding lagoons of gray whales, fin, humpback, sei, and the largest of all—blue whales. In addition to some of the best whale-spotting in the world, you'll get a close-up view of colonies of northern elephant seal, schools of dolphins, myriad birds and fish, strange endemic plants, and very lovely scenery.

The Art and Culture of Indonesia— A Voyage to the Islands of the Java Sea

March 21-April 8

Composed of thousands of islands forming a vast archipelago, Indonesia is an ancient land of gentle peoples, rich and varied cultural traditions, and tropical landscapes of unsurpassed beauty. With its panoply of religions, art forms, rituals, and dances found nowhere else in the world, Indonesia confronts the visitor with a fascinating past; its history, myth, and legend are often inseparable. On an itinerary which has been carefully planned to include well-known sites as well as remote, verdant isles, we will travel aboard the ship *Illiria* to destinations of immense beauty.

New Zealand Cultural Expedition

April 14—May 4
Price: $4,675
(double occupancy)

The Maori people of New Zealand welcome you to their country and their hearts with this unique opportunity to live and share with them in a rich cultural adventure. This is the first year American tour groups have been allowed to stay with the Maori in their traditional meeting houses, where we will be ceremonially initiated into Maori society. This once-in-a-lifetime chance is offered to Field Museum members in conjunction with our forthcoming exhibit, "Te Maori: Maori Art From New Zealand Collections," and is led by Dr. John Terrell, curator of oceanic archaeology and ethnology at Field Museum.

The Great Silk Route of China

May 21—June 15
$4,500

The silk route linked China, Central Asia, Persia, the Middle East, and Europe nearly 2,000 years ago, giving birth to the exotic and spectacular oasis cities of Xinjiang Province. Merchants carried more than silks, silver, and spices along this route, however; they also carried ideas, traditions, and Buddhism. Field Museum will trace the Chinese portion of this great caravan highway, bringing to you not only a sense of Chinese history, but the movements of history itself. We fly from Chicago to Tokyo and from there to Beijing, where touring will include the Forbidden City, the Temple of Heaven, the Summer Palace, the National Museum, and to the north, the tombs of the Ming Emperiors and the Great Wall.

In Urumqui we get our first taste of the silk route as this exotic, green-blanketed oasis thrives amidst bleak desert, highlands, and the snow-capped peaks of the Tianshan Mountains. It is the capital of the Xinjiang Uygur Autonomous Region, populated mostly by the Uygur Muslims and showing their influence in all aspects of its life. Huge mosques dominate the city; the people strictly observe their religious festivals and dress in distinctive costumes, the older women wearing veils, as they keep their traditions. Turpan is likewise an oasis in the desert, a small but richly exotic caravan city still bustling with colorful bazaars. From here you can visit the ruins of two ancient silk route cities, destroyed by Genghis Khan, but yet beautiful in the golden sand.

Dunhuang, our next stop, proves the importance of the silk route in dispersing new ideas and new religions. Here we find one of the world's priceless troves of Buddhist art. The Magao Caves, the oldest Buddhist shrines in China, were begun in A.D. 366 by a monk who saw a vision of a thousand golden Buddhas. Hundreds of caves have been carved out of the sandstone cliffs in a layered honeycomb pattern, connected with wooden walkways and ladders. Carved over a period of a thousand years, these grottoes bear witness to the changing artistic style and daily lives of the Chinese people. Some of the statues show an Indian influence. The walls of these caves are carved with niches containing brilliantly painted statues, and the ceilings are painted with murals depicting the life of Buddha, Chinese mythology, religious stories, and the daily activities of the local people.

Lanzhou is another important caravan city and garrison town since ancient times. If the water level is high enough, we will take a river trip to Binglingsi, a Buddhist monastery with rarely seen monumental carvings. Xian is our next stop. Once the largest city in the world, dressed in imperial splendor, it served as capital of eleven dynasties. It was a major trade route link in the 7th and 8th centuries, but is now primarily known for the discovery there of the vast life-size terra cotta army buried with an ancient emperor.

Shanghai is currently China's largest, most populous and urbanized city. It has a western flavor even today. The contrast of the "Old Town" which is typically Chinese, and the 1930s high-rise district is startling. Guilin is perhaps the most beautiful city in China, situated on a lush green plain laced with rivers and lakes. A cruise on the Li River shows off this region's spectacular scenery and its "stone forest" of amazing rock formations. Our next visit is to Guangzhou (Canton), an interesting city that is increasingly integrating with Hong Kong. It is the most important trade and industrial center in southern China and has a subtropical flavor with its verdant parks, world-famous cuisine and boisterous atmosphere. On to Hong Kong for a day before returning to Chicago via Tokyo.

TOURS FOR MEMBERS

The Classical Mediterranean

May 24—June 8

What better way to sail the blue Mediterranean than aboard the legendary *Sea Cloud*? The largest private sailing ship ever built, she retains the elegance of the past while offering contemporary comfort. In addition to many other ports, we visit Rome, Pompeii, Tunis, Malta, Naxos, Cephalonia, and Athens. The program will be enhanced by a series of educational lectures and discussions presented by accompanying faculty, offering insight into the art, architecture, archaeology, and culture of the civilizations that once thrived on these shores. Richard De Puma, a Field Museum research associate in the Department of Anthropology and associate professor at the University of Iowa's School of Art and Art History will be tour escort. He earned his Ph.D. in classical archaeology and knows intimately the ancient sites to be visited on this tour. Dr. De Puma has worked extensively in archaeological research and excavations of ancient Mediterranean cultures, has written numerous articles and books, been involved in several museum exhibitions of classical antiquities and has recently attended two international congresses on Etruscan archaeology and culture. He is an exceptional lecturer and leader.

North Cape and Spitzbergen

Sailing Date: June 28

Sail to the Land of the Midnight Sun, to the North Cape, where the sun shines 24 hours a day, aboard the "ultra deluxe" *Vistafjord*. This Five Star ship boasts unabashed luxury and superior cuisine.

We sail from the exciting seaport city of Hamburg, Germany, past majestic ice-blue fjords, including Norway's most splendid Geirangerfjord, exploring the region's Viking past in such towns as Molde, which has reconstructed a Viking village. Narvik's exquisite wildflowers, Magdalena Bay's massive glaciers and Longyearbyen's coastline of seals, walrus, whales, and myriads of sea birds, make this a natural history tour of startling beauty. Our tour leader, Dr. Bertram G. Woodland, geologist at Field Museum, will enrich this adventure with his thorough knowledge of the rock formations and geologic history of the fjords, and discussions on the many interesting excursions. He invites you to consider this fabulous cruise for a delightful experience you won't soon forget.

English Homes and Country Tour

July 1-15
price $2,725
(double occupancy)

The National Gallery of Art in Washington, D.C. is currently showing "The Treasure Houses of Britain: Five Hundred Years of Private Patronage and Art Collecting." This exhibition features art from the collections of private country estates and the National Trust, arranged within a simulation of their domestic settings. Exhibitions such as this are marvelous supplements to a direct experience such as Field Museum Tours' *English Homes and Country Tour,* through which you may view these pieces within their architectural context, and amidst their natural landscapes. You may explore many of the "treasure houses," gardens, countryside, and homes of southeastern England, and you will gain a true appreciation of English country life as you live in the homes of English people. Hosts and hostesses include baronets, generals, doctors, company directors, members of Parliament and landowners. Their homes range from mansions to more modest, yet extremely comfortable country cottages. Accommodations include use of a private bathroom.

In addition to a local guide, a scholar from the Field Museum will make this a rich and unusual adventure. Dr. Peter Crane was born and raised in England, getting his Ph.D. in botany at the University of Reading. He is an associate curator in the Department of Geology at Field Museum and was recognized as one of ten "Outstanding Young Citizens" by the Chicago Junior Association of Commerce and Industry in 1985. He is excited about this unusual travel opportunity in his native country and invites you to join him and his countrymen in an exploration of English Homes and Country.

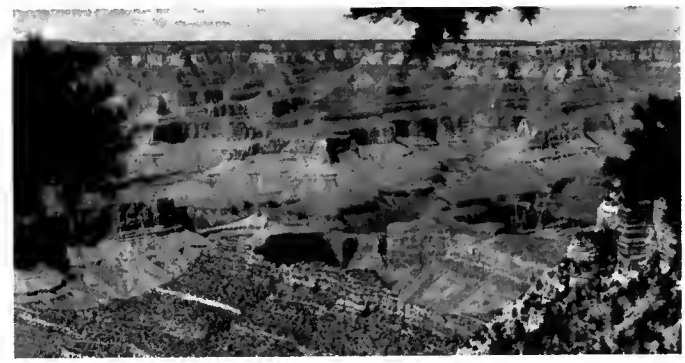
Alaska

July 2-16

The pristine state of Alaska offers a natural history adventure of exquisite beauty to the discerning traveler. Vast parklands of premier wildlife—with vistas of caribou, dall sheep, and bear, from the foot of Mt. Denali (McKinley) to the mighty Portage Glacier. We'll enjoy several short cruises featuring whale, seal, and myriad species of waterbirds, such as cormorants and puffins. St. George Island, rarely visited by humans, is home to spectacular flocks of seabirds and a vast seal population. There, we'll be staying at the St. George Hotel, a National Historic Landmark.

Several fascinating cities are on the itinerary—Juneau, Fairbanks, and Anchorage—but perhaps the most interesting is Sitka, with its Russian heritage apparent in the architecture, food, and shops. Here, we get a chance to visit the Raptor Center, where a dedicated team of scientists care for wounded birds of prey. Hiking, museums, "flightseeing," park service presentations, unusual shopping, dog sled demonstrations, salmon bakes, and a scenic train trip through Denali Park are many of the treats this adventure offers you.

Dr. David Willard, manager of Field Museum's bird and mammal collections, will be tour leader. He received his Ph.D. in Biology at Princeton University, where he was acting curator of Princeton Museum of Ornithology. He has been on a number of research expeditions for Field Museum. His experience in bird and animal identification and his experience as a tour leader will enrich this expedition for you. He invites you to share in the beauty of Alaska this summer.



Grand Canyon

Grand Canyon Adventures

August 13-22
August 22-31

Field Museum Tours is offering two trips to the Grand Canyon in 1986. The first, August 13-22, is a geology study trip hiking down the north rim of the canyon, rafting for four days along the bottom and hiking back up the south riom. The second, August 22-31, is a rafting trip along the entire 300-mile length of the canyon by two motorized rubber rafts. Dr. Matthew H. Nitecki, curator of fossil invertebrates, leads both. A deposit of $50 per person will hold your space.

For further information or to be placed on our mailing list, call or write Dorothy Roder, Tours Manager, Field Museum, Roosevelt Rd. at Lake Shore Dr., Chicago, IL 60605. Phone: 322-8862.

f[illegible]um of Natural History
[illegible]ship Department
[illegible]evelt Road at Lake Shore Drive
Chicago, IL 60605-2499

FIELD MUSEUM OF NATURAL HISTORY BULLETIN

March 1986

"Te Maori: Maori Art from New Zealand Collections" Exhibit March 8 - June 8

For associated films, lectures, demonstrations, performances see pages 3-5

Members' Preview March 7

Field Museum of Natural History Bulletin

Published by
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CONTENTS

March 1986
Volume 57, Number 3

COVER

Mask from gateway of a pa, *or fortified Maori village, in New Zealand, 64 cm. (25¼ in.) high, was made by the Ngati Manawa tribe during the Te Huringa I period (1800 - present), and is in the collection of the Otago Museum, Dunedin, New Zealand. It may be seen at Field Museum from March 8 through June 8 (members' preview March 7) among 173 artifacts in the exhibit "Te Maori: Maori Art from New Zealand Collections." The exhibition was organized by the American Federation of Arts in association with the New Zealand government, the Maori people, and the New Zealand lending museums. Made possible by a grant from Mobil. Supported by the National Endowment for the Arts, the National Endowment for the Humanities, an indemnity from the Federal Council on the Arts and Humanities, Air New Zealand, and the National Patrons of the American Federation of Arts. For related events see pages 3-5. Photo by Athol McCredie.*

Halley Hot Line

A new Comet Halley Hot Line, to keep fans of the returning comet on top of its whereabouts, went into service on December 15.

The new high-volume commercial service allows several thousand callers at the same time to hear a recorded message about the comet. The information is provided by the United States Naval Observatory in Washington.

For people anywhere in the United States, Canada, Puerto Rico and the Virgin Islands, calls to the telephone number, (900) 410-8766, cost 50 cents for the first minute and 35 cents a minute after that.

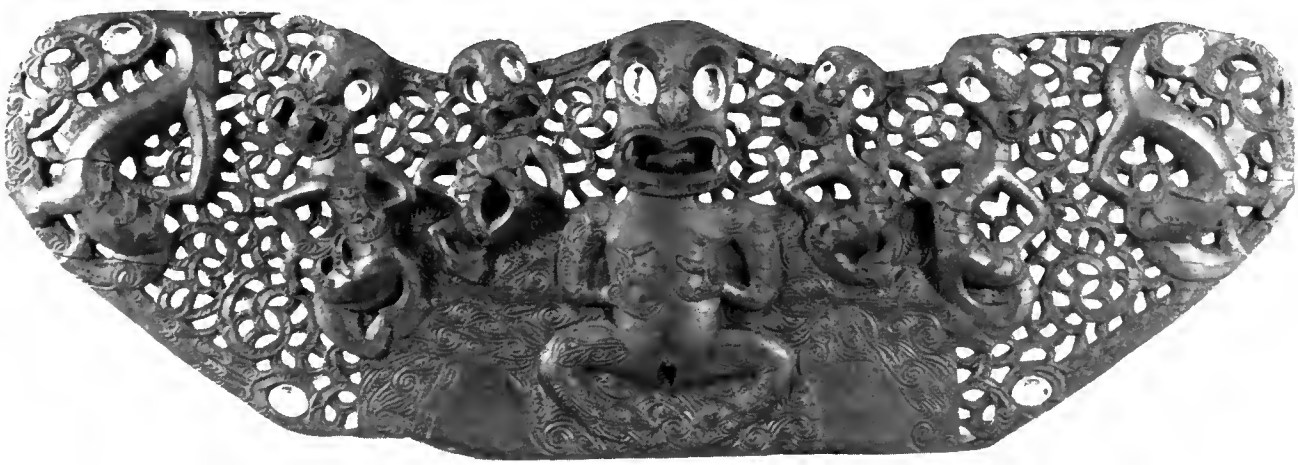
The recorded messages will be updated regularly, talking about the whereabouts of the comet—making its first return visit since 1910—and telling callers how to locate it in the night sky. The hotline is expected to remain in service until April 15.

Maori Catalog at Museum Store

The exhibit catalog, *Te Maori: Maori Art from New Zealand Collections*, published 1984 by Harry N. Abrams Inc. in association with the American Federation of Arts, is available at the Field Museum Store at $35.00 for the hardbound and $17.50 for the paperbound edition (10% discount for Members). The 8½ × 11 book has 244 pages, 60 color plates and numerous halftones as well as maps.

Field Museum of Natural History Bulletin (USPS 898-940) is published monthly, except combined July/August issue, by Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, Chicago, IL 60605-2496. Subscriptions: $6.00 annually, $3.00 for schools. Museum membership includes *Bulletin* subscription. Opinions expressed by authors are their own and do not necessarily reflect the policy of Field Museum. Unsolicited manuscripts are welcome. Museum phone: (312) 922-9410. Notification of address change should include address label and be sent to Membership Department. Postmaster: Please send form 3579 to Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, Chicago, IL 60605-2496. ISSN: 0015-0703.

Events



Lintel made of wood and shell, 235 cm. (7 ft 8 in.) wide, by the Maori of the Ngati Tamatera tribe; Te Huringa period (1800 to present), in the collection of Aukland Institute and Museum. One of 173 artifacts on view in the special exhibit "Te Maori: Maori Art from New Zealand Collections." Photo by Athol McCredie.

"Te Maori: Maori Art from New Zealand Collections"

March 8-June 8

"TE MAORI" is the first international exhibition devoted exclusively to Maori art, one in which all of the objects have been borrowed from the land where they were created. The exhibition owes its existence to the wisdom of the elders and people of the Maori tribes of New Zealand, who have agreed to the journey of their ancestors' treasures *(taonga)* far from their homelands. These most prized and remarkable carvings and sculptures represent all periods of Maori art, from about 1000 to 1880, and have been lent with the cooperation of the thirteen New Zealand museums which house them.

"Te Maori: Maori Art from New Zealand Collections" was organized by the American Federation of Arts in association with the New Zealand government, the Maori people, and the New Zealand lending museums. The exhibition was made possible by a grant from Mobil. Supported by the National Endowment for the Arts, the National Endowment for the Humanities, an indemnity from the Federal Council on the Arts and Humanities, Air New Zealand, and the National Patrons of the American Federation of Arts.

Special Opening Celebrations

Saturday, March 8
12:00 - 1:00pm; 2:30 - 4:00pm.
Craft Demonstration

Wood carving and weaving demonstrated by members of the Maori Cultural Group of New Zealand.

1:30pm.
Performance

Members of the Maori Cultural Group of New Zealand present a program of Maori music and dance.

Sunday, March 9
12:30 - 1:30pm; 3:00 - 4:30pm.
Craft Demonstration

Wood carving and weaving demonstrated by members of the Maori Cultural Group of New Zealand.

2:00pm.
Performance

Members of the Maori Cultural Group of New Zealand present a program of Maori music and dance.

These celebrations are free with museum admission. Tickets are not required.

CONTINUED →

Events

Lecture Series

Saturday, March 8, 2:30pm
James Simpson Theatre

"Tribal Arts as Symbols of New Zealand Identity"
Sidney Moko Mead, professor of Maori, Victoria University at Wellington, New Zealand

Saturday, March 15, 2:30pm
James Simpson Theatre

"The Polynesian Perspective: Pacific Origins and Migrations"
John E. Terrell, curator, Oceanic Archaeology and Ethnology, Field Museum

Saturday, March 22, 2:30pm
James Simpson Theatre

"Maori Art in Pacific History"
Douglas Newton, chairman, Department of Primitive Art, The Metropolitan Museum of Art

Tickets

Individual Lectures: $5.00 (Members: $3.00)

Series of Three Lectures: $11.00 (Members: $7.00)

Fees are nonrefundable. Please use coupon to order tickets. Seating is general admission.

Family Feature

The Face of Te Maori

Saturday and Sunday, March 15 and 16

1:00-3:00pm

The Maori People of New Zealand call their traditional tattooing *moko*. These decorations were made of intricate, swirling patterns of curves and spirals. Look at some Maori tattoos and design your own. Take your drawing home or paint it on your face right here at Field Museum.

Field Museum's public programs are funded, in part, by a grant from the National Endowment for the Humanities, a federal agency.

Performance

"An Evening of Maori Song, Dance, and Drama"

Saturday, March 8, 8:00pm

James Simpson Theatre

Over the past 1,000 years, the Maori tribes of new Zealand have developed a rich island culture. Spend an evening with our Maori visitors exploring the traditions of the Maori people through myth and legends. Dressed in their native puipui shirts and using the poi, balls twirling on string, members of the Maori Cultural Group present dramatizations of their past, sing traditional songs of greeting, love and lament, and dance the haka, a Maori dance. Dr. Peter Sharples concludes the program with a dramatic reading, "I Am a Maori," accompanied by slides.

Tickets: $7.00 (Members: $5.00)
Fees are nonrefundable. Please use coupon to order tickets. Seating is general admission. Theatre doors open one hour prior to the performance.

Public Programs Information: (312) 322-8854.

Film Program

Saturday and Sunday

March 22 and 23, 1:30pm

"Children of the Mist" 30 min.

A brief history of the Tuhoe Tribe of New Zealand is followed by a depiction of the life and problems of this contemporary, rural Maori tribe that has migrated to an urban area.

Film programs are free with museum admission. Tickets are not required.

Events

March Weekend Programs

EACH SATURDAY AND SUNDAY you are invited to explore the world of natural history at Field Museum. Free tours, demonstrations, and films related to Museum exhibits are designed for families and adults. Listed below are only a few of the numerous activities each weekend. Check the *Weekend Passport* upon arrival for the complete schedule and program locations. The programs are partially supported by a grant from the Illinois Arts Council.

1 2:00pm. *China's Wondrous Animals* (slide lecture). Look at China's real and imaginary animals and the lore and significance attached to them.

2 2:00pm. *Malvina Hoffman: Portraits in Bronze* (slide lecture). Explore the life and works of Malvina Hoffman, concentrating on the Portraits of Mankind collection.

8 12:00 noon. *Treasures from the Totem Forest* (tour). An introduction to the Northwest Coast Indians and the importance of their totem poles and masks.

9 12:00 noon. *Traditional China: The Jades* (tour). Examine the imagery, history, and life-styles represented by Chinese jades and other masterworks.

15 1:30pm. *Tibet Today: Refugees and a Faith in Exile* (slide lecture). Investigate Lhasa and see refugees in Dharmsala (home of the Dalai Lama), Darjeeling, and Sikkim.

These public programs are free with museum admission and tickets are not required.

Edward E. Ayer Film Series

James Simpson Theatre
1:30 pm

March—POLAR REGIONS

6 *"Never Cry Wolf"*

13 *"Nanook of the North"*

20 *"Out of Sight, Out of Mind" and "Irresistible Forces"*

27 *"The Water Life" and "Ice Society"*

Registration

Be sure to complete all requested information on the ticket application. If your request is received less than one week before a program, tickets will be held in your name at the West Entrance box office. Please make checks payable to Field Museum. Tickets will be mailed upon receipt of check. Refunds will be made only if the program is sold out.

☐ Member ☐ Nonmember

American Express/Visa/MasterCard

Card Number

Signature Expiration Date

Name

Address

City State Zip

Telephone: Daytime Evening

Return complete ticket application with a self-addressed stamped envelope to:

Field Museum of Natural History
Public Programs: Department of Education
Roosevelt Road at Lake Shore Drive
Chicago, IL 60605-2497

Have you enclosed your self-addressed stamped envelope?

Program	Number of Member Tickets	Number of Nonmember Tickets	Total Tickets	Amount Enclosed
Evening of Maori Song, Dance, Drama				
Lecture Series (3 lectures)				
Mead Lecture				
Terrell Lecture				
Newton Lecture				
			Total:	

Nga Huarahi O Te Ao Maori
Pathways in the Maori World

by Anne Salmond

Photos by Athol McCredie

In the tribal landscapes of early historic times, pathways were cut along beaches and ridges, through bush, and beside rivers, passing through the territory of one descent group and into the lands of the next. A traveler in his own countryside could name its features minutely—rocks, caves, beaches, fishing grounds, points, streams, eeling pools, patches of bush, cultivations, swamps, rat runs, trees, ridges, hills, and mountains, even clumps of grass — every smallest feature had its name, which evoked the quality of that unique place and the ancestors who had named it or passed that way. The place names marked the land and domesticated it, fitting it for man's occupation; and the paths gave him direction in his jouneys. This was *whenua* (land), source of life for its people.

The land was known intimately, because people moved often in those days. War parties, groups on seasonal migration, on trading trips, or on the way to some celebration traveled along the paths and waterways, setting up camp and moving through the bush in search of food. And if a group was driven off their land or forced to migrate to a new district, they lamented, singing their grief for the abandoned bones of their forefathers, as in Te Rauparaha's lament for his land:

Nāku ia na koe i waiho i taku whenua iti	I leave, you my beloved land
Te rokohanga te taranga i a tāua	in this unexpected parting
Ka mihi maomao au ki te iwi ra ia,	And greet my ancestors from a distance
Moe noa mai te moenga roa.	lying on their beds of death.[1]

These fighting, singing, talking travelers were *nga tangata* (people) standing on the earth between underworld (*po*) and the layered heavens and managing the balance of the universe with their battles and their spells.

Men and land dwelled together in life and death, and their names — of places and men — crossed and crossed again in genealogies and tribal stories. The dead were buried in their settlements, sometimes in the very houses in which they had lived,[2] and the *papa* (layers) of the cosmos were echoed in *whakapapa* (layers of descent lines) which began with *po* (nothingness or nights) and came down to this world of light, gods, and men:

Ka hua te wānanga	Knowledge became fruitful,
Ka noho i a rikoriko	It dwelt with the feeble glimmering;
Ka puta ki waho ko te pō	And so night was born:
Ko te pō nuī, te pō roa	The great night, the long night,
Te pōi tūturi, te pō i pēpeke	The lowest night, the loftiest night,
Te pō uriuri, te pō tangotango	The thick night, to be felt,
Te pō wawā	The night to be touched,
Te po tē kitea	The night not to be seen,
Te pō i oti atu ki te mate.	The night of death.
Na te kore i ai	From the nothing the begetting,
Te kore te wiwia	From the nothing the increase
Te kore te rawea	From the nothing the abundance,
Ko hotupu	The power of increasing,
Ko hauora	The living breath;
Ka noho i te ātea	It dwelt with the empty space
ka puta ki waho te rangi e tū nei	and the sky above was born
Ko te rangi e teretere ana	The atmosphere which floats
i runga o te whenua	above the earth;
Ka noho te rangi nui e tū nei	The great firmament above us,
Ka noho i a ata tuhi	dwelt with the early dawn,
Ka puta ki waho te marama	And the moon sprung forth;
Te rangi i tū nei, ka noho i a te werawera	The sky above us dwelt with the heat,
Ka puta ki waho ko te rā	And the sun was born;
Kokiritia ana ki runga	They were thrown up above,
Hei pūkanohi mo te rangi	As the chief eyes of Heaven:
Ka tau te rangi	Then the Heavens become light,
Te ata tuhi, te ata rapa	The early dawn, the early days,
Te ata ka mahina, ka mahina te ata i hikurangi	The mid-day, the blaze of the day from the sky.
Ka noho i Hawaiki	The sky above dwelt with Hawaiki,

Anne Salmond is senior lecturer in Social Anthropology at the University of Aukland. She is also author of *Hui: A Study of Maori Ceremonial Gatherings* (1975); *Amiria: The Life Story of a Maori Woman* (1976); and *Eruera: The Teachings of a Maori Elder* (1980).

"Pathways in the Maori World" and the maps on pages 9 and 11 are from Te Maori: Maori Art from New Zealand Collections, *published in 1984 by Harry N. Abrams, Inc. in association with The American Federation of Arts, text copyright © 1984 by Sidney Moko Mead, Agnes Sullivan, David R. Simmons, Anne Salmond, Bernie Kernot, and Piri Sciascia.*

*Canoe bow cover (*haumi*) made of wood, 107 cm. (42¼ in.) long, by the early Maori of the Te Tipunga period (1200-1500). Collection of the Aukland Institute and Museum.*

MEMBERS' PREVIEW OF

Te Maori: Maori Art from New Zealand Collections

Friday, March 7

5:00 pm to 9:00 pm

At 6:00, Dr. John Terrell, Field Museum's curator of Oceanic archaeology and ethnology and exhibit curator of "Te Maori," will introduce Dr. Sidney Moko Mead, professor of Maori, Victoria University at Wellington. There will be a performance of traditional Maori songs and dance in Stanley Field Hall following the introduction and Dr. Mead's opening remarks. Light refreshments will be served.

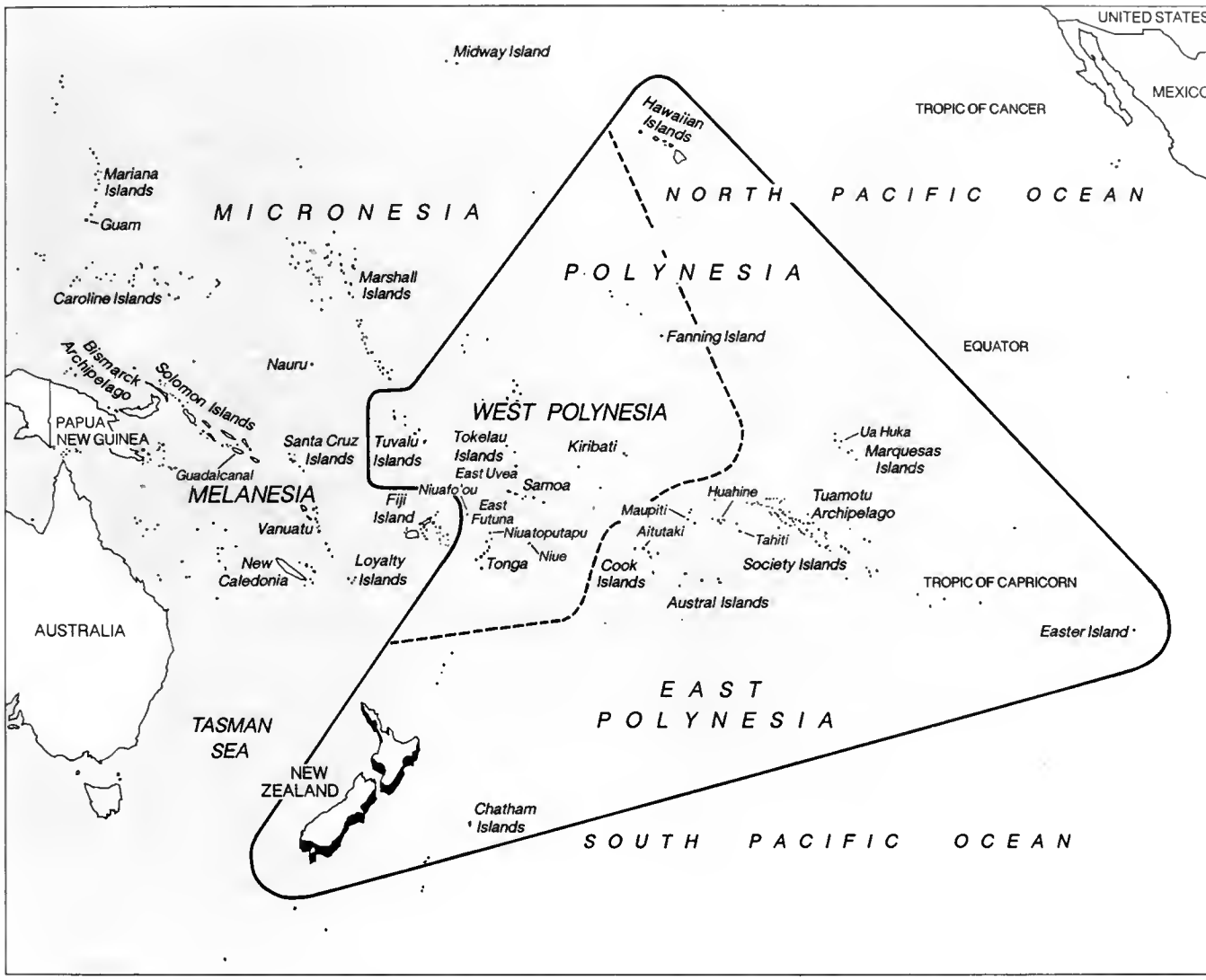
"Te Maori" is the first international exhibition devoted exclusively to Maori art and culture. These 173 remarkable heirlooms of traditional art combine major sculptures and carvings in wood, stone, jade, bone, ivory, and shell, dating from AD 1000 to 1800. Among the works presented from more than 30 Maori tribes are monumental architectural sculptures, elaborate canoe carvings and equipment, weapons, tools, musical instruments, mortuary carvings, and objects of personal adornment.

The exhibit catalog, *Te Maori: Maori Art from New Zealand Collections*, edited by Dr. Mead, and *Prehistory in the Pacific Islands*, by Dr. Terrell, will be available for purchase.

Special arrangements for handicapped persons can be made by calling 922-9410, ext 453. The CTA #146 Marine/Michigan bus services Field Museum. Call CTA (836-7000) for the evening schedule.

"Te Maori: Maori Art from New Zealand Collections" was organized by the American Federation of Arts in association with the New Zealand government, the Maori people, and the New Zealand leading museums. Made possible by a grant from Mobil. Supported by the National Endowment for Arts, the National Endowment for the Humanities, an indemnity from the Federal Council on the Arts and Humanities, Air New Zealand, and the National Patrons of the American Federation of Arts.

Please join us for a very special evening



Ka puta ki waho ko Tāporapora, ko Tauwarenīkau, ko Kūkū-paru, ko Wawau-atea, ko Wiwhi-te-Rangiora

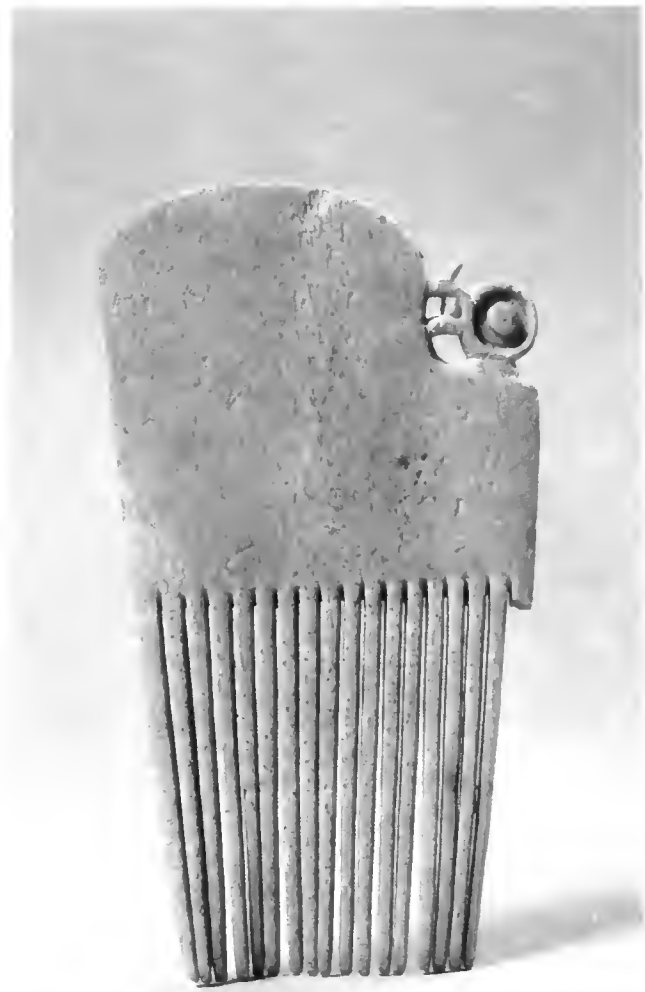
and land was born. Taporapora, Tauwarenikau, Kuku-paru, Wawau-atea. Wiwhi-te-Rangiora.[3]

The universe that was shaped in this series of cosmological matings, according to the same early source, had

> either ten or eleven Heavens; the lowest was separated from the earth, by a solid transparent substance like ice or crystal, and it was along the underside, or that next to the earth, that the sun and moon were supposed to glide. Above this pavement was the grand reservoir of rain, and beyond that was the abode of the winds.
>
> Each Heaven was distinct, the lowest being the abode of the rain; the next of Spirits; the third of the winds; the fourth of the light, the highest of all, being the most glorious, and therefore the chief habitation of the gods.[4]

The world was not simply a physical structure, though; the sky was Rangi, the Sky Father, and the earth was Papatuanuku, the Earth Mother, and generations of gods were born from their mating. During the eons that they lay together, the universe was dark and still, and very cold. Rangi clothed his woman with trees and plants to warm her, and as the temperature rose on earth the life of the small creatures began, and Papa gave birth to their sons, the gods. It was a terrible time for the god-children, because there was still no light in the world and they lay imprisoned between their parents

> some lying on their sides, some were lying stretched out at full length, some on their backs, some were stooping, some with their heads bent down, some with their legs drawn up, some embracing ... some with exhausted breath, some crawling, some walking, some feeling about in the dark, some arising, some gazing, some sitting still, and in many other attitudes—they were all within the embrace of Rangi-nui and Papa.[5]

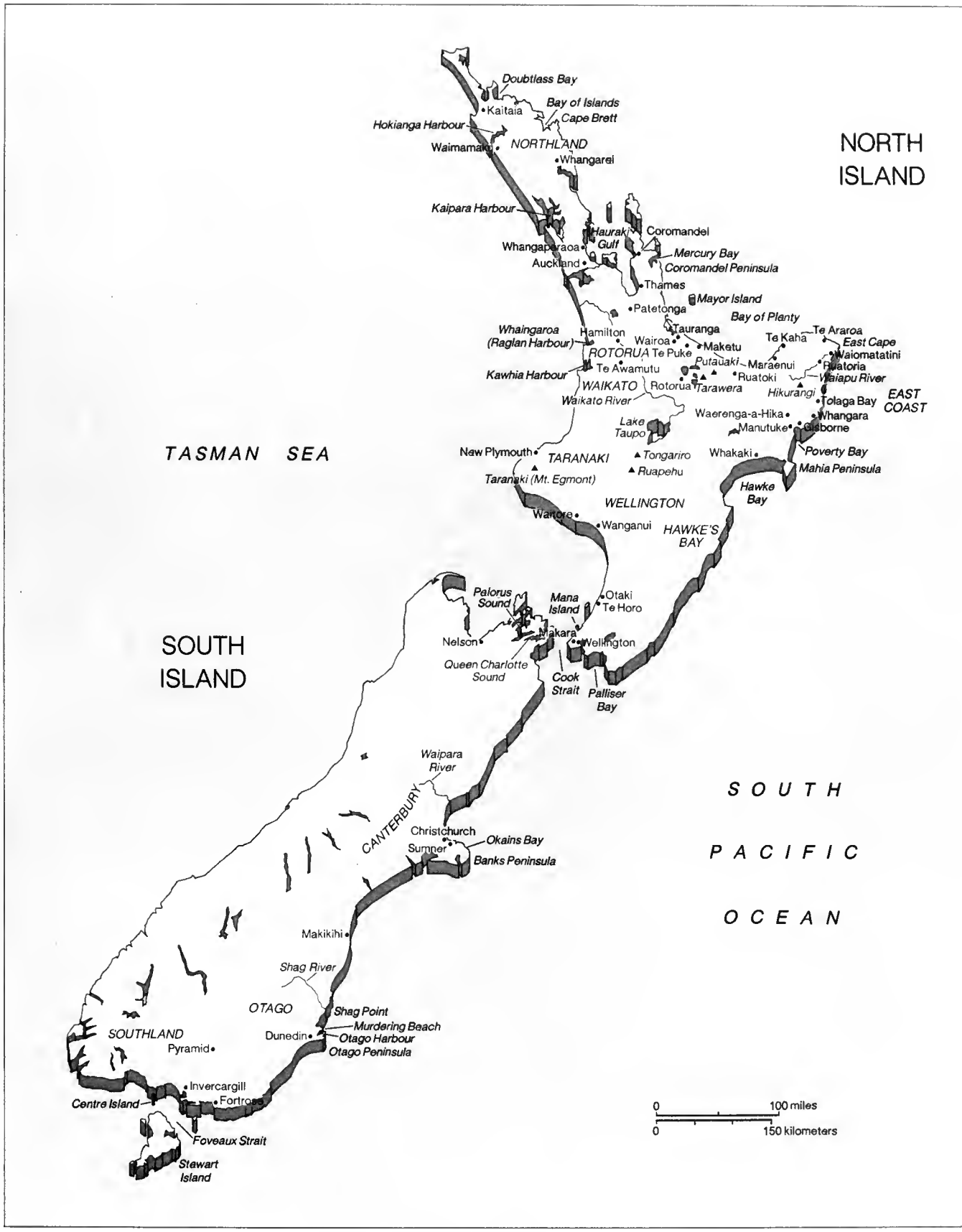


◇ *Comb (*heru*) made of whalebone, 13 cm. (5⅛ in.) high, by the Ngai Tahu clan, Queen Charlotte Sound; from the Te Puawaitanga period (1500-1800). Collection of Nelson Provincial Museum. Men tied their hair in a bun and thrust combs into the topknot.*
◇ *Burial chest (*waka tupapaku*) made of wood, 98 cm. (38⅝ in.) high, by the Ngapuhi tribe, Northland; from the Te Puawaitanga period. Collection of the National Museum of New Zealand, Wellington. After the flesh had rotted away, the bones of dead chiefs and other notables were painted with red ocher and placed in a* waka tupapaku, *or secondary burial chest. The chest was positioned upright in a cave in order to frighten intruders away.*

Ever since that timeless period of futility and frustration, darkness has had awful connotations for the Maori people:

pirau: extinguished (fire, light), decay, death, rotten, pus
mate: extinguished (fire, light), decay, sick, unconscious
tinei: extinguish (fire), destroy, kill, confused, disordered
ngaro: hidden, lost, disappeared, distressed, unavenged

It was a younger and active son, Tane the god of forests and men, who finally broke out of this impasse. He said to his brothers, "We must force our parents apart." They argued with


NORTH ISLAND
SOUTH ISLAND
TASMAN SEA
SOUTH PACIFIC OCEAN
Doubtless Bay
Kaitaia
Bay of Islands
Cape Brett
Hokianga Harbour
Waimamaku
NORTHLAND
Whangarei
Kaipara Harbour
Hauraki Gulf
Coromandel
Whangaparaoa
Auckland
Mercury Bay
Coromandel Peninsula
Thames
Mayor Island
Patetonga
Bay of Plenty
Whaingaroa (Raglan Harbour)
Hamilton
Tauranga
Te Kaha
Te Araroa
East Cape
Waiomatatini
Waiotoria
Waiapu River
Wairoa
ROTORUA
Te Puke
Maketu
Putauaki
Maraenui
Ruatoki
Tarawera
Hikurangi
Kawhia Harbour
Te Awamutu
WAIKATO
Rotorua
Waikato River
Tolaga Bay
EAST COAST
Waerenga-a-Hika
Whangara
Lake Taupo
Manutuke
Gisborne
New Plymouth
TARANAKI
Tongariro
Ruapehu
Whakaki
Poverty Bay
Mahia Peninsula
Taranaki (Mt. Egmont)
Hawke Bay
WELLINGTON
Wanganui
HAWKE'S BAY
Palorus Sound
Mana Island
Otaki
Te Horo
Nelson
Wellington
Queen Charlotte Sound
Cook Strait
Palliser Bay
Waipara River
CANTERBURY
Christchurch
Okains Bay
Sumner
Banks Peninsula
Makikihi
Shag River
OTAGO
Shag Point
SOUTHLAND
Dunedin
Murdering Beach
Otago Harbour
Otago Peninsula
Pyramid
Invercargill
Centre Island
Fortrose
Foveaux Strait
Stewart Island
0
100 miles
0
150 kilometers

New Zealand

him and disputed, but finally they agreed, and Tane used all his strength to put props between Rangi and Papa, and light flooded into the world. This was the first *tu tangata*, when the ancestor of men stood up and asserted his power to change the universe. The themes of this feat are echoed in the Maori language:

ihi: split, divide, separate; fear, dread; power, authority, rank, essential force; a form of sacred shrine (tuahu); spell, charm, incantation; dawn, a ray of sun

Like their ancestor Tane, men in the Maori world sought to control the world by exerting their strength in magic and in war:

kaha: strength; line on which niu rods are placed for divination; line of an army

hau: vitality of man, land; strike, smite; food offered to atua in propitiatory rites

Tane went on to create the first woman, Hine-hau-one, and, while his brothers made fish, kumara, fern root, the winds, evil and disease, war and peace, Tane slept with this woman and made her pregnant, and so the generations of man began. In this East Coast tribal cosmological account, as in every other, the universe, land, gods, men, and all living creatures are kinfolk bound in a tangle of shared ancestry, and this binding of man and world was expressed in the term for the people of any locality: *tangata whenua* (land men).

The principle that ordered the apparent weltering chaos of plants, animals, objects, and men in the tribal world was genealogy, described as the twining tendrils of the gourd plants with its stem (*tahuhu*, also "main line of descent") and branches (*kawae*, also "subsidiary lines") in one ancient metaphor and still thus represented in the curving red, white, and black paintings of the underside of the ridgepole (*tahuhu*) and rafters (*heke*, also "descent line") of the modern meeting house.[6]

Genealogy, the preeminent object of Maori scholarship, was an aristocratic reckoning, but this was not a simple aristocracy of birth. Descent lines were claimed according to their vitality and power, and the greater the success of one's ancestors in war, magic, oratory, and feasting, the greater the *mana* (prestige) that they passed down the descent line to their descendants. This power was like the power that made plants grow and flourish, and I have heard elders speak of one's descent lines as *te iho makawerau* (*iho* of a hundred hairs):

iho: heart, kernel, pith, essence; that which contains the strength of a thing; the principal person or guest; umbilical cord; lock of hair, upward, in a superior position.

This expresses the thought that lines of descent came down to a person like the hundred hairs on his head, bringing him power from his ancestors and effective force in the world. Just like a gourd plant, or a tree, a descent line might flourish and thrive, or if its vital force is attacked in magic or in war, it might fail altogether and die. And like the plant it is rooted in land, as in this characteristic tribal proverb:

Ko Hikurangi te maunga
Ko Waiapu te awa
Ko Porourangi te tangata
Ko Ngati Porou te iwi.

Hikurangi is the mountain
Waiapu is the river
Porourangi is the man
And Ngati Porou the people.

The *taonga whakairo* (patterned treasures), the works represented in this exhibition, are above all a celebration of this unity of men, ancestor gods, and land. It was precisely because descent lines branched and divided, and new lines took root elsewhere, that Maori social life and the treasures it produced were fundamentally tribal and referred to particular landscapes. Aotearoa (New Zealand) ranges from subtropical habitats in the north to chilly fjords in the south, and there was no one way of living that can be described for all of the country. Agnes Sullivan has spoken of regional differences in the archaeological record, and David Simmons has described reflections of these differences in tribal art. I will turn to the early historic accounts to try and bring these differences, and the taonga whakairo of this exhibition into the context of tribal life.

When Captain James Cook brought his shipload of scientists, artists, and sailors south to New Zealand in 1769, they spent six months circumnavigating the islands and anchoring in various harbors. As they traveled, the observers on board were struck by differences in Maori life in the various communities they visited. At Anaura Bay on the East Coast, for instance, two old chiefs came on board the *Endeavour*, one in a dogskin cloak and the other wearing a cloak ornamented with tufts of red feathers, and they accompanied Cook ashore. About one hundred people were living at Anaura in scattered small clusters of houses among their gardens. Monkhouse, the surgeon on board, wrote that night:

> The cultivations were truely astonishing. . . the ground is completely cleared of all weeds—the mold broke with as much care as that of our best gardens. The Sweet potatoes are set in distinct little molehills which are ranged some in straight lines, in others in quincunx, in one Plott I observed these hillocks, at their base, surrounded with dried grass. The Arum (taro) is planted in little circular concaves, exactly in the manner our Gard'ners plant melons. . . the Yams are planted in like manner with the sweet potatoes; these Cultivated spots are enclosed with a perfectly close pailing of reeds about twenty inches high.[7]

Joseph Banks estimated that these gardens ranged from one-to-two to eight-to-ten acres each and totaled about one hundred fifty to two hundred acres in high cultivation. Later that evening Monkhouse wandered up into the hills and visited a family of a man, his wife, two sons, and two female servants living in a single house on its own. The husband showed Monkhouse his paddles and digging tools and some red ocher and brought out of his house a collection of spear tips. The house was low and thatched, with a carved board over the door—the first *pare* (door lintel) ever to be seen by a European.

Anaura was an agricultural community, with some carved canoes, no great quantity of greenstone goods, and not much carving on the houses. At Tolaga, only ten miles to the south, things were very different. The landscape was attractive; one of the artists on board said of it, "The country about the bay is agreeable beyond description, and with proper cultivation, might be rendered a kind of second Paradise. The hills are covered with beautiful flowering shrubs, intermingled with a great number of tall and stately palms, which fill the air with a most grateful fragrant perfume."[8] There were cultivations there too, but in Tolaga the local preoccupation was carving. On an island in the bay, Banks saw a carved canoe seventy

Pendant, fishhook (matau) *made of whalebone, 16 cm. (6¼ in.) high, by the Kai Tuhu people of Otago Heads, Papanui Inlet; from the Te Puawaitanga period (1500-1800). Collection of Otago Museum, Dunedin. It is doubtful that this somewhat delicate fishhook was used for utilitarian purposes. It is much more likely to have been a ceremonial hook worn as an amulet*

⌓ *Flute (*koauau*) made of wood, 13 cm. (5⅛ in.) long, by the Te Roroa people of the Waimamaku valley; from the Te Huringa I period (1800-present). Collection of the Otago Museum, Dunedin. The flute has two finger holes, with a third under the curved tip.*
◊ *End post from storehouse (*epa*) made of wood, 100 cm. (39⅜ in.) high, by the Te Ati Awa tribe of North Taranaki, Waitara; from the Te Puawaitanga period (1500-1800). Collection of Taranaki Museum, New Plymouth.*

feet long and a house thirty feet long filled with chips and its side posts elaborately carved. The ship's artist added,

> The men [at Tolaga] have a particular taste for carving their boats, paddles, boards to put on their houses, tops of walking sticks, and even their boats valens, are carved in a variety of flourishes, turnings and windings, that are unbroken; but their favorite figure seems to be a volute, or spiral, which they vary many ways, single, double, and triple, and with as much truth as if done from mathematical draughts; yet the only instruments we have seen are a chizzel, and an axe made from stone.[9]

Tolaga was a treasure trove of taonga whakairo, and it is no coincidence that this is the place where Te Rawheoro, the school of learning and carving skills, was founded by Hingangaroa.

The settlements on the East Coast were undefended and peaceful, but as the *Endeavour* cruised along into the Bay of Plenty those on board saw the cliffs bristling with huge fortified sites, fleets of canoes drawn up on the beach, and large gardens on shore. This was evidently a densely populated and wealthy area, where warfare was commonplace. The *Endeavour* was chased and overtaken in this area by a carved double sailing canoe, whose crew threw stones and smashed her windows.

Several days later at anchor in Mercury Bay on the Coromandel Peninsula, they could observe at first hand the ravages of war. In Mercury Bay every small rock out at sea had a fortification perched on top, and the local people seemed miserable and impoverished. The canoes that came alongside were simple dugouts, without any decoration, and the people on board were "almost naked and blacker than any we had seen . . . yet these few despicable gentry sang their song of defiance and promised us as heartily as the most respectable of their country men that they would kill us all."[10] *Haka* (war dances) were a standard way of greeting strangers and not necessarily hostile, but the Europeans knew nothing of the proper etiquette and when provoked replied with smallshot or musketballs. There was one good-sized fortification in the Bay which Cook visited and described; it was defended on the land side of its promontory by a double ditch and bank, two palisades and a fighting stage, and inside the ground was laid out in twenty palisaded divisions of one-to-two to twelve-to-fourteen houses each. Dried fish and fern root were piled up inside in heaps, and bundles of darts and heaps of stones were ready on the fighting stage. The local people confided to the Europeans (through the Tahitian interpreter, Tupaea) that they were frequently raided from the north by warriors who captured their wives and children and destroyed all their possessions. Cook summed up the situation in Mercury Bay by saying:

> Its inhabitants . . . altho pretty numerous are poor to the highest degree when compair'd to others we have seen; they have no plantations but live wholly on fern roots and fish, their canoes are mean and without ornament, and so are their houses or hutts and in general everything they have about them.[11]

Their taonga had been utterly ransacked.

In the Bay of Islands, several hundred miles to the north, however, there was plenty of visible wealth and this area could well have been the home of the raiders who were making life miserable for the people in Mercury Bay. Certainly Ngapuhi were raiding Thames and much farther south in the very early historic period in their fleets of sailing canoes. As the *Endeavour* ran toward Cape Brett, two large canoes came out to meet her:

> The strangers were numerous and appeared rich: their Canoes were well carvd and ornamented and they had with them many weapons of *patoo patoos* [patu] of stone and whale bones which they value much; they had also ribbs of whales [hoeroa] of which we had often seen imitations in wood carved and ornamented with tufts of Dogs hair.[12]

Clearly, we are back in taonga territory. The chiefs had dogskin cloaks and prolific tattoos, and on shore there were large gardens and fortified towns in every direction. The major local industry appeared to be fishing, and Banks spoke with some awe of nets four to five hundred fathoms (2,400 to 3,000 feet) long, adding that the locals laughed a little at their own net, a common king's seine.

Archaeological work in this area suggests that the main cultivations were some way inland, and the coastal sites were mainly dedicated to collecting sea resources. This area was, like Anaura, able to support a range of cultigens, including a few prized plants of aute (barkcloth). Agnes Sullivan's postulates about settlement patterns would seem to be well supported by the eyewitness accounts of the Bay of Islands. There is also a very curious story collected by Banks just north of the Bay which suggests that two-way voyaging may have persisted well into the settlement period. Tupaea, the Tahitian on board, talked to people who came out to the ship in canoes and asked them

> if they knew of any Countries besides this or ever went to any. They said no but that their ancestors had told them to the NW by N or NNW was a large countrey to which some people had sailed in a very large canoe, which passage took them up a month: from this expedition a part only returned who told their countreymen that they had seen a countrey where the people eat hogs, for which animal they usd the same name (Booah) [puuaa] as is usd in the Islands. And have you no hogs among you? said Tupia. — No. — And did your ancestors bring one back with them?—No.—You must be a parcel of Liars then, said he, and your story a great lye for your ancestors would never been such fools as to come back without them.[13]

Unfortunately Tupaea, who was also much given to lecturing the Maori about the evils of cannibalism, was a thoroughgoing Polynesian chauvinist.

The final place visited on this voyage was Queen Charlotte Sound to the south of Cook Strait, where bands of hunters and gatherers retreated to their *pa* (fortified settlement) on Motuara Island where the *Endeavour* arrived but soon dispersed to open-air camps along the shoreline in groups of fifteen to twenty. These people had no cultivations but lived off fern root and the local supplies of fish, and enthusiastically hunted down their enemies. Cannibalism is mentioned for most other places visited by Cook in 1769-70, but here it was everyday practice. It is difficult to know who was more horrified by the evidence of cannibalistic custom in New Zealand, the Europeans or Tupaea. When they came across some chewed human bones in a provision basket by a shore camp, they asked the local people, "what bones are these? they answered, The bones of a man. . . . Why did not you eat the woman who we saw today in the water?—She was our relation.—Who then is it that you eat?—Those who are killed in

war.—And who was the man whose bones these are? 5 days ago a boat of our enemies came into this bay and of them we killd 7, of whoom the owner of these bones was one."[14]

Tattoo styles, dialects, clothing, settlement patterns, and the distribution of carving, cultivation, ornamented canoes, greenstone, and other riches varied markedly from district to district in these first fleeting glimpses of classic Maori life. As one contemplates carvings and greenstone ornaments, the great taonga of the Te Maori exhibition, it is as well to remember also the dugout canoes and rough shelters of more marginal populations living in many parts of New Zealand. It is not only our hearts that might quiver at the sight of spirals and speckled jade; in earlier times, as a war canoe's sternpost swept around the headland and the sun splintered off the edge of a greenstone weapon, then people's hearts quivered in earnest and they ran for their lives to the hills. Wealth, power, and danger came together in Maori life and thought:

> *kura:* treasure; red, glowing (the tapu color); a *taiaha* (weapon) ornamented with red feathers; red ocher; chief man of prowess; knowlege of *karakia* (prayers) and mediation with the gods (*wananga*); ceremonial restriction, danger.

Treasures also implied knowledge and power to converse effectively with the gods.

Knowledge is the way to a Maori understanding of the taonga in this exhibition, for each treasure was a fixed point in the tribal network of names, histories, and relationships. They belonged to particular ancestors, were passed down particular descent lines, held their own stories, and were exchanged on certain memorable occasions. Taonga captured history and showed it to the living, and they echoed patterns of the past from first creation to the present. It is not possible to give a single account that will interpret each of these works, because their history belongs to individual groups and each group told its history differently. *Wananga* (knowledge of mediating with the gods) and *matauranga* (knowledge of the past, genealogy, chants, and spells) were treasures taken by ancestor gods and passed down the descent lines as part of their sacred power. Descendants claimed the knowledge of their own group and sought to maintain its mana. Listen to the old priest Te Matorohanga, who had taken part in the East Coast school of learning Te Rawheoro, speaking to his pupils in about 1865:

> Attention! O Sirs! Listen! There was no universal system of teaching in he Whare Wānanga. Each tribe had its own priests, its own college, and its own methods. From tribe to tribe this was so; the teaching was diverted from the true teaching by the self-conceit of the priests which allowed of departure from their own doctrines to that of other Whare Wānanga [school of learning]. My word to you is: Hold steadfastly to our teaching: leave out of consideration that of other (tribes). Let their descendants adhere to their teaching, and you to ours; so that if you err, it was we (your relatives) who declared it unto you (and you are not responsible); and if you are in the right, it is we who shall leave to you this *taonga*.[15]

There was no one cosmos in precontact times, then, because variations in the tribal accounts extended right back to the stories of creation; the ecological variations observed by the first explorers were echoed in different ways of explaining the universe. Tribal taonga were located in different conceptual as well as physical landscapes, and the truth of their stories was held to be truth within a particular tribal tradition. What they held in common, though, was their ability to act as a focus for ancestral power and talk.

The famous Taranaki *taiaha* (long staff) Te Porohanga, for instance, was used by the fighting chief Titokowaru in the 1860s as a medium for Uenuku, his battle god. When Titokowaru was about to go into battle with the British, he gathered his warriors and stood before them with the taiaha balanced horizontally between forefinger and thumb. The spirit of Uenuku entered the taiaha and it would turn and point to those men who should join the war party that day.

Another taonga that is still held by its inheritors is the greenstone tiki Mahu-tai-te-rangi. When Tahupotiki, the younger brother of Porourangi, founding ancestor of Ngati Porou, was forced to migrate to the South Island, some of his followers discovered a great rock of greenstone hidden in a cave.

> They chipped off a piece and showed it to Tahu, and it was lighter in colour than the greenstone in the water. I suppose the sun had been beating down on the river greenstone for years and years and turned it that dark green colour, but the greenstone in the cave was hidden away and it had stayed very pale. They were trying to think of a name for it when somebody spotted some herrings in the river. "Hey! *He inanga*—herrings! It's pale like those herrings," so they called the greenstone from the cave "inanga." The people decided to make something from that first chip, and because it was for the chief it had to be very fine. "How shall we carve it?" "Oh . . . you design it like a man, he'll be the one to lead us. Give him hands and a face and everything." "Yeah, but don't put his tongue out because we don't want a fighter. If he's going to be our leader we need someone who can talk to us and tell us what to do. Just leave his mouth open as though he's saying 'Go this way . . . no, not that!'" "And don't put a hole through his head, we don't want him dead. Just put the string through his arm and keep his hands up, because if his hands are down that means his work is finished—*ka pu te ruha, ka hao te rangatahi*—the old net is set aside, so you young people go fishing. But this man, no! He's going to live with us forever and be our guide to tell us what to do and what not to do."
>
> So they carved the tiki Mahu-tai-te-rangi with one hand on his hip, and his face looking up at you all the time.[16]

This is Amiria Stirling, the present holder of the tiki, talking about its history. When she was recently interviewed on television about old customs she wore Mahu-tai-te-rangi, and as she spoke the tiki twisted on its cord. Her husband saw this and said to her, "You see? Mahu-tai-te-rangi doesn't agree with what you're saying—he's turning his back!"

Greenstone weapons were also revered and handed down from father to son. A man would risk his life to recapture such a weapon, and might sing in its praise:

> I fasten Te Heketua's strap (round my waist)
> Indeed, you are not very large
> (Still), the skin is clasped as at night by a woman's legs![17]

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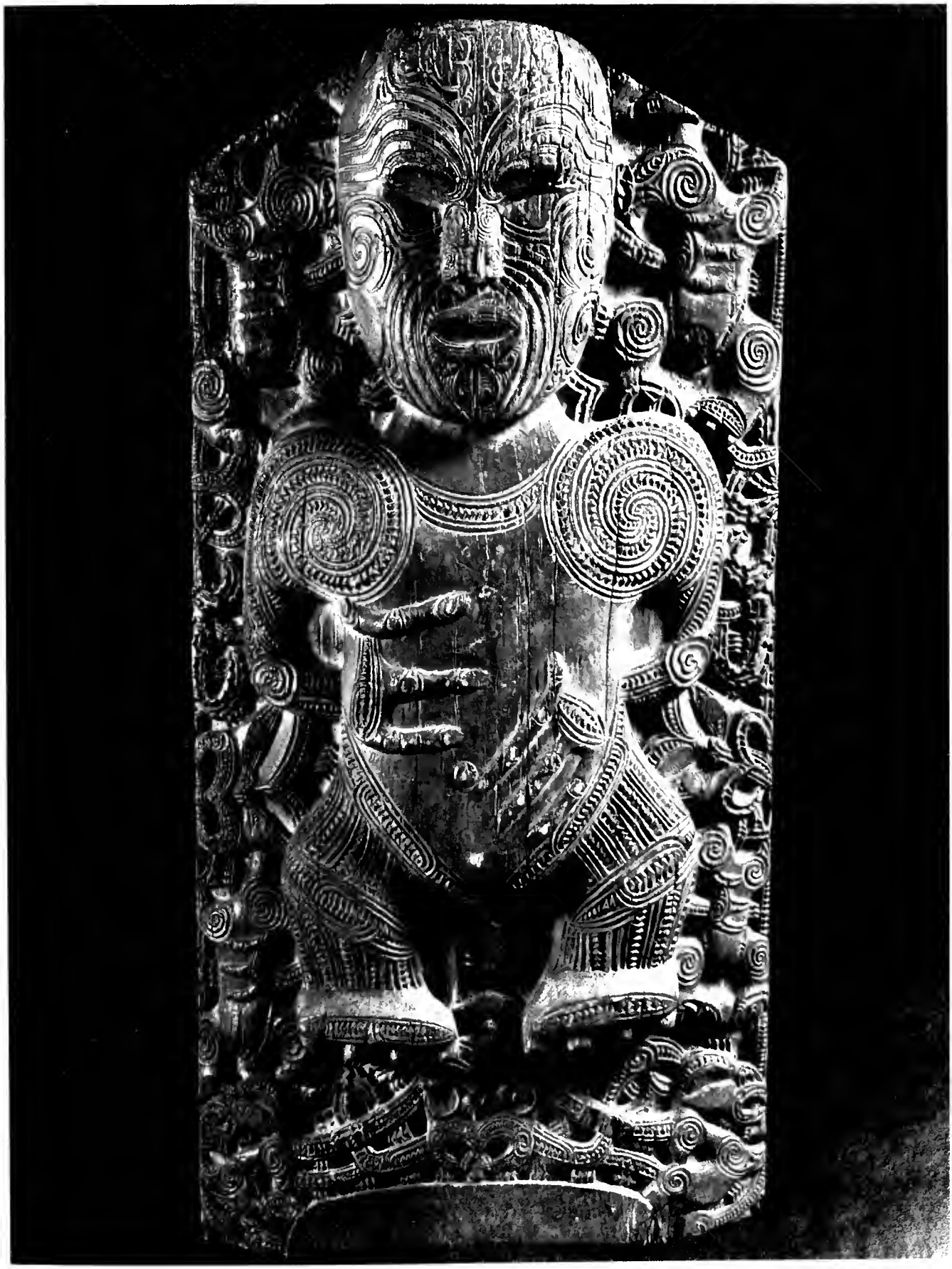
*Storehouse doorway (*kuwaha pataka*) made of wood, 92 cm. (36¼ in.) high, by the Ngati Kuhungunu tribe of Here taunga; Te Huringa I period (1800-present). Collection of the National Museum of New Zealand, Wellington.*



A famous *mere* (hand club) was a great gift, for reasons that are explained in this translation of an early Maori text:

> The group of young people got up and put on their girdles, ready to leave, and their hosts gathered for the ritual of farewell. The chief of that fortified village took his greenstone *mere* and gave it to the young visiting high chief, and he in return presented his greenstone weapon to his host. Those *mere* were *manatunga* (heirlooms) and in the old custom it was proper for such men to exchange such weapons, because they represented the descent lines which held them in keeping. A prized greenstone weapon was kept for a time by the descendants in one line of descent, and then they carried it and presented it to those in another line of descent from the tribal ancestor who first made it. That was the way of exchanging those weapons.[18]

A woman berating the kinfolk of a man who has taken her daughter without consent might say to them, "Come out of your stockade. Why did you rob me of my daughter? What property have I of yours, that you should presume to take my precious greenstone to wear on your breast? Come outside, that we may fight our battle."[19]

Greenstone heirlooms could be included in genealogies, and all these *manatunga* (greenstone treasures, literally, "standing mana") had an extraordinary power of binding, tying the living to the living in alliances, peace, and marriage, and the living to the dead. A peace ratified by greenstone should stand fast, and there was no more bitter treachery than one where a greenstone treasure had already been passed over. A weapon called Te Uira was given by Ngati Maru to Ngapuhi during the nineteenth-century warfare, but no sooner was Te Uira received than Ngapuhi attacked, killing many of the local people. About fifty years later a Ngati Maru scribe wrote to the government asking for this treasure to be returned: "If you are the Government, and as Ngapuhi are so loyal to the Government, you might speak to Ngapuhi, and ask them to give the mere Te Uira back to us, the Ngati Maru. We do not ask for the people—they are dead, but Te Uira is still in existence, nor can it decay. . ."[20]

At marriages, and the funerals of great chiefs, greenstone treasures were passed over to show loyalty and love and were at a later time returned. The pathways of alliance were traveled by women, children (in adoption), and greenstone, and so the tribal groups were bound together.

Carved images also summoned up the ancestor they described. Taylor describes how "the friends of the dead either carved an image, which they frequently clothed with their best garments, or tied some of the clothes of the dead to a neighbouring tree, or to a pole; or else they painted some adjacent rock or stone, with red ochre, to which they gave the name of the dead; and whenever they passed by, addressed it as though their friend were alive and present, using the most endearing expression and casting some fresh garments on the figure, as a token of their love."[21]

The heads of dead kin were preserved for this same reason, so that they might be wept over and cherished, and at a funeral in the descent group they were arranged around the head of the body, so that all the dead could be mourned and remembered together. Today, framed photographs are used in just this way. The chief's house of early contact times and the modern meeting house also embody ancestors, quite literally, for the house is named after some great predecessor and is built in his likeness, with the ridgepole (*tahuhu*, "main line of descent") as his spine, the *koruru* (carved head at the gable) as his head, the outstretched bargeboards with their end carving (*raparapa*) representing his arms with hands spread wide in welcome, and the interior as his belly. When an orator stands to speak on the marae forecourt he addresses the house by name, and when the kin group assemble inside the meeting house at night and lie beneath its carved side posts (*poupou*) and the photographs on the wall, all of the descent group—living and dead—have come together in the belly of their ancestor.

The alchemy of taonga was to bring about a fashion of men and ancestors and a collapse of distance in space-time. The world was understood as a medium (*wa*) in which intervals could be marked out (*taki*) in social space by ritual, in groups by numbers, in physical space by boundaries, and in time by genealogy, but within this medium distance was not immutable. The power of *kura* (treasures, knowledge, chiefly men) could give men absolute access to their ancestors. Listen to an old Tauranga chief speaking in a great debate about a century ago, about the canoe origins of the kumara: "As for your canoe Tainui, it was built after my canoe Mahanga-a-tua-mahara came here: what's more I made both these canoes, and I still have the adzes and the priests (their history and names) in my keeping. Of every single canoe that came here to New Zealand, my canoe was the first!"[22] His first knowledge (*kura*) of the traditions of his tribe and his conviction of their absolute validity transcended perhaps a thousand years of distance and placed him among his ancestor craftsmen as they labored to build their canoe on the beaches of Hawaiki.

Names, knowledge, ancestors, treasures, and land are so closely intertwined in tribal thinking that they should never be separated. An irony of this exhibition is that we know so little of the history of its individual taonga, just because they have left the keeping of their inheritors. The early collectors saw these works as "artificial curiosities," and later as "artifacts" and "primitive art," and they had neither the interest nor in most cases the understanding to note anything more than a physical description of the item, and sometimes a place and date of collection, and an approximate label of use. The "artificial curiosities" were put in storerooms and given to museums, which is indeed the European way of caring for relics of the past. But the distancing and separation from people that this involves could not be more different from the Maori way of caring for *manaaki* (their treasures). It is only when a work stays with the people, when it is touched, wept and talked over, and takes part in their great gatherings that its history stays alive. It is now impossible to discover the names of most of the taonga in this exhibition—in Maori terms the only really vital piece of information about them—or anything of their history; because either they come from archaeological sites, or elders refused to pass over the stories when the works were first acquired, or their collectors did not think to ask that sort of question, and the works have been held in museums for too long. For all our efforts of interpretation, those of us who write in this catalogue cannot tell the stories that really matter about most of these works. We can only seek to demonstrate that these objects were once—and to Maoris still are—not artifacts, nor primitive art, but things of power.

"Well then, the works themselves stand. . . in collections and exhibitions. But are they here in themselves as the works

*Club (*wahaika*) made of wood, 46 cm. (18⅛ in.) long, by the Ngapuhi tribe. Te Huringa 1 period (1800-present). Collection of the Canterbury Museum, Christchurch. This type of curved wooden hand club was used for close infighting.*

they themselves are? Works are made available for public and private art appreciation. Official agencies assume the care and maintenance of works. Connoisseurs and critics busy themselves with them . . . yet in all this busy activity, do we encounter the work itself?

"However high their quality and power of impression, however good their stage preservation, however certain their interpretation, placing [works] in a collection has withdrawn them from their own world . . . The works are no longer the same as they once were. It is they themselves, to be sure, that we encounter there, but they themselves are gone by."[23]

Aue, taku kahurangi e . . . Alas, my precious one . . . !

(Lament for a lost treasure)

Notes

1. Apirana Turupa Ngata and Pei Te Hurinui Jones, *Nga Moteatea (The Songs)*, Polynesian Society Maori Texts (Wellington: Polynesian Society, 1959-1970), p. 92 (author's translation).
2. Richard Taylor, *Te Ika a Maui, or, New Zealand and Its Inhabitants . . .* (London: Wertheim and Macintosh, 1855), 98.
3. *Ibid.*
4. *Ibid*, 17
5. S. Percy Smith, *The Lore of the Whare-Wananga, or, Teachings of the Maori College on Religion, Cosmogeny, and History*, Polynesian Society Memoirs, vols. 3-4 (New Plymouth, New Zealand: Avery, 1913-1915), I, 18.
6. Anne Salmond, "Pathways in the Modern World," in *Te Maori: Maori Art from New Zealand Collections*, Sidney Moko Mead, ed. (New York: Harry N. Abrams, 1984), 112, 113.
7. John C. Beaglehole, *The Journals of Captain James Cook: Addenda and Corrigenda to Volume I, The Voyage of the "Endeavour," 1768-1771* (Cambridge: University press, 1968), 583-584.
8. Sydney Parkinson, *A Journal of a Voyage Round the World* (London: T. Becket and P.A. de Hondt, 1771), 97.
9. *Ibid*, 98.
10. John C. Beaglehole, *The "Endeavour" Journal of Joseph Banks, 1768-1771* (Sydney: Angus and Robertson, 1962), I, 425.
11. John C. Beaglehole, 1968, *Ibid*, 203.
12. John C. Beaglehole, 1962, *Ibid*, I: 438-439.
13. *Ibid*, 446-447.
14. *Ibid*, 455.
15. S. Percy Smith, *Ibid*, I-III.
16. Amiria Manutahi Stirling and Anne Salmond, *Amiria: The Life Story of a Maori Woman* (Wellington: Reed, 1976), 162.
17. J. Prytz Johansen, *The Maori and His Religion in Its Non-ritualistic Aspects* (Copenhagen: Ejnar Munksgaard, 1954), 102.
18. John White, *The Ancient History of the Maori: His Mythology and Traditions* (Wellington: Government Printer, 1887-1890), IV, 125-127, author's translation.
19. *Ibid*, 161.
20. *Ibid*, 183.
21. Richard Taylor, *Ibid*, 62
22. *White, Ibid*, 17-18.
23. Martin Heidegger, *Basic Writings from "Being and Time" (1927) to "The Task of Thinking" (1964)*, D.F. Krell, Ed. (London: Routledge and Kegan Paul, 1978), 167.

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*Stockade post figure (*pou whakairo*), made of wood, 175 cm. (68⅞ in.) high, by the Ngati Kahungunu tribe of Ahuriri; Te Huringa 1 period (1800-present). Collection of Hawke's Bay Art Gallery and Museum, Napier.*

ANTHROPOLOGY
The Human Experience

by Donald McVicker and Nancy Evans

Robert Pickering (left), of the Museum's Department of Education, explains skeletal features to Science in Action students Amy Bender and Edward Zubek. Photo by Nancy Evans.

Since the opening of Field Museum's doors almost a century ago, schoolchildren have wandered through the acres of exhibits marveling at objects made by people from other places and other times. Since 1966, high school students have spent part of their summers at Field Museum discovering more about these people and the times in which they lived. Field Museum's Science in Action program, "Anthropology: The Human Experience," has provided Chicago-area high school students with an opportunity to learn the stories behind the artifacts on display and find out more about the science that studies humankind culturally and biologically.

Under the instruction of anthropologists at Field Museum and local universities, the students are introduced to the science of anthropology and its subfields. The program seeks to provide students with an understanding of the various ways in which anthropologists study humans and how information about them is integrated to achieve a holistic view of human cultures. The program's primary goal, however, is to help students gain a

Dr. Donald McVicker is associate professor, Department of Sociology-Anthropology, at North Central College, Chicago. Nancy Evans is program developer, Exhibit Related Programs, of Field Museum's Department of Education.

Field Museum's Science in Action program is partially supported by grants from the University of Illinois—Chicago and the Spensley Fund of Field Museum.

Students discovered the history of Chicago's St. Boniface Cemetery and its "residents" through the monuments and tombstones. Here, at the monument for those who died in the Civil War, the late John Niemeyer, cemetery sexton, describes the cemetery's founding in 1863. Photo by Nancy Evans.

better understanding of their own and other cultures.

Hands-on experience with artifacts, research projects, and field work, together with lectures, make it possible for the students to explore physical and cultural anthropology and archaeology first hand, and give them experience in using anthropological methods. For instance, in the study of physical anthropology, students learn how to determine age, sex, and cause of death by examining skeletal material in the classroom and in museum exhibits. A primate observation study at Lincoln Park Zoo gives them the chance to simulate the work of the primatologist. In the study of cultural anthropology, students discuss how people are related to one another and how they define their families. A kinship chart is made by each student of his or her family to understand American kinship structure as well as to understand the relationships between members of their families. The students discover that even in their own culture many differences between families are to be found.

One of the highlights of the 1985 anthropology program was the project associated with the unit on archaeology. To acquaint students with fundamental archaeological methods and give them an appreciation of the general process of archaeological research in a relatively short time, a cemetery project was developed under the direction of Donald McVicker, co-author of this essay.

The cemetery project provided the Science in Action students with a taste of archaeological "field work," in which they gathered preliminary data, then formulated hypotheses on the basis of these data—steps intrinsic to the process of scientific research. They learned at the outset that surface survey and dating of above-ground artifacts is the initial step in archaeological research. They also learned that before the first shovel of earth is turned, the right questions have to be asked.

The students spent nearly a week investigating a Catholic cemetery in Chicago. St. Boniface Cemetery, on north Clark Street, was selected for the study because it is old (founded 1863), ethnic (German-American), religious, and small enough for the students to become familiar with it in the short time available. As a "residence of the dead," St. Boniface reflects changing fashions in tombstones and monuments, changes in Chicago's ethnic neighborhoods, and the social organization of the Catholics who have buried there. The cemetery sexton, Mr. John Niemeyer (since deceased) and his secretary, Ms. Jane Hengl, were most cooperative and generous with their time.

The students' first acquaintance with the cemetery came at Field Museum, by means of color slides of the site; past research as well as possible future projects were discussed. The students were also introduced to seriation, or style dating, of artifacts. This was followed by a grand tour of St. Boniface, with Mr. Niemeyer as guide.

Mr. Niemeyer helped the students see how the history of the cemetery and its "residents" could be read in the monuments and how the monuments were distributed. He pointed out two distinctive features that would catch the attention of any archaeologist: first, the entire east end of the cemetery had only flat markers for individual graves, and these surrounded a large statue of St. Joseph; second, in areas other than the east end,

flat markers, all of recent date and often with family names different from those of upright monuments, were arranged in odd lineal patterns. He explained that the St. Joseph shrine represented a change in Catholic burial practices, reflecting in turn the economics of maintaining a cemetery. Shrine areas, with their flat markers, can be literally mowed over by large power mowers, while the old "marble forests" must be laboriously (and expensively) maintained by hand.

Mr. Niemeyer explained that the second feature—the odd lineal patterns of grave arrangements—reflected ethnicity as well as economics. The St. Boniface neighborhood had undergone changes in its ethnic composition, and most burials of recent date were those of newly arrived and less affluent Hispanic families. He also noted that since the cemetery was running out of space, old roads and walkways were being removed to make way for individual graves. These less expensive single plots were now being sold, one by one, in rows to today's burying population.

The students were invited to ask about the population that was buried at St. Boniface, and their questions were developed into individual research projects. They wanted to know how the various ethnic groups buried at St. Boniface could be identified on the basis of monument styles; how information about demographic changes could be gained from the memorials; and about differences between Catholic and non-Catholic cemeteries. They were also curious about the ways in which archaeologists distinguish between the evolution of monument types that result from ethnic change and evolution that is due to new social statuses emerging.

To help the students recognize how such styles change, Ronald Weber, manager of Field Museum's anthropology collection, gave a presentation based on his own archaeological research. Referring to materials in the South American Indian exhibit, Dr. Weber explained how he was able to date different styles of Argentine burial urns. He also demonstrated how burial urns can offer clues to social status. To further the students understanding of stylistic variations, Dr. Weber used ancient Peruvian ceramic vessels from the museum storerooms to demonstrate how changes in shape over a period of time can enable archaeologists to arrange vessels in chronological sequence, even when stratigraphic information is lacking.

New learning experiences for the students followed in quick succession. A film was shown on the history of Graceland Cemetery, located on Chicago's North Side, followed by a tour of the architectural wonders of that cemetery by Mr. Bert J. Gast of Gast Monuments, Inc. He demonstrated how monuments and memorials reflected the lifestyle of wealthy Chicagoans. A comparison between Graceland and St. Boniface dramatically demonstrated how the study of cemeteries can reveal differences in socio-economic status.

Following his tour, Mr. Gast took the students through the Gast Monument Company, where he discussed the technology of monument manufacture and explained how new technologies can influence customers' preferences in styles and materials. His presentation impressed on the group how archaeologists can use technological change as a key to understanding social and cultural choices.

Now the students were prepared to refine their projects and to gather their data from St. Boniface. Quite an array of projects were attempted. Several dealt with fads in monument types. Obelisks, draped urns and crosses, and unusual tree-shaped monuments received special attention. Inscriptions as an information source were also a popular subject of investigation. Changes in family size and composition was investigated, life-span differences among ethnic groups were determined, and age differences between husband and wife were traced through the decades.

At week's end, the students presented their reports orally, and the projects were discussed by the group. The students returned for a final afternoon at St. Boniface to check their data and to refine their conclusions. For a finale, the students guided their instructors on tours of the cemetery. They had come to understand how the residence of the dead could be used to teach us about the society in which the deceased had once lived.

The cemetery project was an excellent opportunity for the students to learn how anthropological methods are used in a fieldwork situation; it also offered them fresh insights into their own culture and their own community. FM

The Piping Plover

A Newcomer to the Endangered Species List

by William J. Beecher

The piping plover is the bird that comes to mind when I wish to think of nature as fragile and innocent. I first saw it in the summer of 1934 while on a field-trip assignment to the Indiana Dunes. Just out of high school, my fortunes (I thought) had already peaked at an all-time high and I was writing a bird column for Henry Justin Smith of the *Chicago Daily News*.

I remember as if it were yesterday that it was still early morning—but the ripple-marked sand was dazzling under the sunny sky. It was my companion, Earl Wright, taxidermist for the Chicago Academy of Sciences, who spotted the bird on the nest and the instant he pointed to it the whole scene erupted like a miniature volcano. The brooding bird slipped off the nest with one wing trailing, as it piped a startling *peep-lo! peep-lo!* This was immediately echoed by the other adult, who had flown in from nearby with a dainty, butterfly-like, hovering flight.

Simultaneously, several fluffs of cotton exploded from the nest in as many directions. The chicks were, indeed, nothing but balls of down on stilts that ran a few steps, then froze, then ran, in a jerky, stop-and-start fashion that was impossible to follow in the dazzling light. These chicks were quite able to shift for themselves, even to feed, but now the parents were taking turns brooding them as protection from the fierce sun. In just a few seconds it was difficult to see where the young birds had come to rest, so well-camouflaged were they with their sand-colored backs and white breasts. The black eyes and bills, with a tuft of black on the back, completed their disguise with a cryptic touch.

I realized I had witnessed an exquisite example of adaptation to a beach habitat. The matching sand color of the back, with white underneath for countershading and the broken black line, destroyed any trace of roundness in the little birds; and the swiftness of their accelerations and decelerations left the bewildered eye racing ahead of where they actually were. Finally, returning, it could see nothing because of the camouflage. Natural selection, in perfecting such a disguise, computes the shortcomings of the predator's eye.

Only 17 breeding pairs of the piping plover are currently recorded for the Great Lakes region. Photos courtesy the Chicago Academy of Sciences.

The piping plover's nest is just a depression in the sand. The number of eggs, which are creamy white, speckled with brown, is usually three or four.

I was as thrilled as if I had just witnessed a miraculous apparition; but now that was gone and the chicks were no longer to be seen.

I now turned my attention to the adults, who were still creating a riot as Earl pretended to be fooled by first one and then another broken-wing act. The adults were also beautifully camouflaged, with sand-colored backs and heads. Their white underparts, reflecting the sand, became the same color as the back. The black band around the neck and the forehead slash, much more prominent than in the chicks, conspired with the black-tipped bill and the eyes to create the cryptic broken line that shattered the now flat and sand-colored object into three fragments. Of course, the seven-inch long adults were much easier to see and their stops and starts were not so dazzlingly swift.

However, the plovers' long legs raise their bodies sufficiently above their shadows cast on the sand to nearly defeat the predator's scheme for breaking through camouflage; watch the shadow to see the true form of the wizard! The white underparts are not completely erased by the reflected color of the sand. Particularly on the breast and face, white is seen when the bird is broadside or facing the observer and standing still. When it moves, you see a streak of white that might be a low-flying object, since the twinkling orange-yellow legs are not noticed. But let the bird just turn its back, even without moving forward, and it disappears.

Today the piping plover is in trouble. In December the U.S. Fish and Wildlife Service declared it an endangered and threatened species. Quite possibly its numbers have been reduced because our burgeoning human populace has cut down the number of pristine beaches; moreover, in those beaches that do remain, our recreational activities take place during the critical months of June and July, when nesting occurs.

This is not the first time that the birds have suffered from human intrusion. Before 1900 the species was almost wiped out by shorebird hunting during the spring and fall migrations, and in that year the federal government put a ban on hunting the piping plover year-round. By the 1920s, it was again common on the Eastern Seaboard, but I am not sure that it was ever really abundant. Perhaps the piping plover is one of those fragile species that prefers remote wilderness places. With their large and beautiful eyes, with plumage soft and spotless, they typify for me the same kind of wild, unalarmed innocence that I have seen in Thompson's gazelles, gazing at my Land Rover as it roared across the East African plains.

From Saskatchewan to Nova Scotia, south to the southern Great Lakes, the beaches of lakeshore and seashore are where the pipers' nests are under attack. On New York's Long Island only 100 breeding pairs are currently reported, and only 17 breeding pairs are recorded in the entire Great Lakes region. The southern beaches from Georgia to Texas and northern Mexico are also under siege, and the plaintive call of the piping clover and the lost-soul cries of curlews, which are the voices of such wild places, are now less often heard.

Fragile they are, and a new human ethic is needed to recognize that these are fellow species on the planet who have a right to exist, not for what they do for us, but for their own sake. Fragile, yes. But I have seen the ancient castle ruins of Europe and know that it is the soft, living things endlessly replicating a fine-honed genetic code, that endure.

Dr. Beecher is director emeritus of the Chicago Academy of Sciences.

Tours for Members

For reservations, call or write Dorothy Roder (322-8862), Tours Manager, Field Museum, Roosevelt Rd. at Lake Shore Dr., Chicago, Il 60605

New Zealand Cultural Expedition

April 14—May 4
Price: $4,675
(double occupancy)

The Maori people of New Zealand welcome you to their country and their hearts with this unique opportunity to live and share with them in a rich cultural adventure. This is the first year American tour groups have been allowed to stay with the Maori in their traditional meeting houses, where we will be ceremonially initiated into Maori society. This once-in-a-lifetime chance is offered to Field Museum members in conjunction with our forthcoming exhibit, "Te Maori: Maori Art From New Zealand Collections," and is led by Dr. John Terrell, curator of oceanic archaeology and ethnology at Field Museum.

The Great Silk Route of China

May 21—June 15
$4,500

The silk route linked China, Central Asia, Persia, the Middle East, and Europe nearly 2,000 years ago, giving birth to the exotic and spectacular oasis cities of Xinjiang Province. Merchants carried more than silks, silver, and spices along this route, however; they also carried ideas, traditions, and Buddhism. Field Museum will trace the Chinese portion of this great caravan highway, bringing to you not only a sense of Chinese history, but the movements of history itself. We fly from Chicago to Tokyo and from there to Beijing, where touring will include the Forbidden City, the Temple of Heaven, the Summer Palace, the National Museum, and to the north, the tombs of the Ming Emperiors and the Great Wall.

In Urumqui we get our first taste of the silk route as this exotic, green-blanketed oasis thrives amidst bleak desert, highlands, and the snow-capped peaks of the Tianshan Mountains. It is the capital of the Xinjiang Uygur Autonomous Region, populated mostly by the Uygur Muslims and showing their influence in all aspects of its life. Huge mosques dominate the city; the people strictly observe their religious festivals and dress in distinctive costumes, the older women wearing veils, as they keep their traditions. Turpan is likewise an oasis in the desert, a small but richly exotic caravan city still bustling with colorful bazaars. From here you can visit the ruins of two ancient silk route cities, destroyed by Genghis Khan, but yet beautiful in the golden sand.

Dunhuang, our next stop, proves the importance of the silk route in dispersing new ideas and new religions. Here we find one of the world's priceless troves of Buddhist art. The Magao Caves, the oldest Buddhist shrines in China, were begun in A.D. 366 by a monk who saw a vision of a thousand golden Buddhas. Hundreds of caves have been carved out of the sandstone cliffs in a layered honeycomb pattern, connected with wooden walkways and ladders. Carved over a period of a thousand years, these grottoes bear witness to the changing artistic style and daily lives of the Chinese people. Some of the statues show an Indian influence. The walls of these caves are carved with niches containing brilliantly painted statues, and the ceilings are painted with murals depicting the life of Buddha, Chinese mythology, religious stories, and the daily activities of the local people.

Lanzhou is another important caravan city and garrison town since ancient times. If the water level is high enough, we will take a river trip to Binglingsi, a Buddhist monastery with rarely seen monumental carvings. Xian is our next stop. Once the largest city in the world, dressed in imperial splendor, it served as capital of eleven dynasties. It was a major trade route link in the 7th and 8th centuries, but is now primarily known for the discovery there of the vast life-size terra cotta army buried with an ancient emperor.

Shanghai is currently China's largest, most populous and urbanized city. It has a western flavor even today. The contrast of the "Old Town" which is typically Chinese, and the 1930s high-rise district is startling. Guilin is perhaps the most beautiful city in China, situated on a lush green plain laced with rivers and lakes. A cruise on the Li River shows off this region's spectacular scenery and its "stone forest" of amazing rock formations. Our next visit is to Guangzhou (Canton), an interesting city that is increasingly integrating with Hong Kong. It is the most important trade and industrial center in southern China and has a subtropical flavor with its verdant parks, world-famous cuisine and boisterous atmosphere. On to Hong Kong for a day before returning to Chicago via Tokyo.

The Classical Mediterranean

May 24—June 8

What better way to sail the blue Mediterranean than aboard the legendary *Sea Cloud*? The largest private sailing ship ever built, she retains the elegance of the past while offering contemporary comfort. In addition to many other ports, we visit Rome, Pompeii, Tunis, Malta, Naxos, Cephalonia, and Athens. The program will be enhanced by a series of educational lectures and discussions presented by accompanying faculty, offering insight into the art, architecture, archaeology, and culture of the civilizations that once thrived on these shores. Richard De Puma, a Field Museum research associate in the Department of Anthropology and associate professor at the University of Iowa's School of Art and Art History will be tour escort. He earned his Ph.D. in classical archaeology and knows intimately the ancient sites to be visited on this tour. Dr. De Puma has worked extensively in archaeological research and excavations of ancient Mediterranean cultures, has written numerous articles and books, been involved in several museum exhibitions of classical antiquities and has recently attended two international congresses on Etruscan archaeology and culture. He is an exceptional lecturer and leader.

North Cape and Spitzbergen

June 27-July 12

Sail to the Land of the Midnight Sun, to the North Cape, where the sun shines 24 hours a day, aboard the "ultra deluxe" *Vistafjord*. This Five-Star ship represents the very epitome of ocean-going elegance: impeccable service, first-class cuisine, dazzling entertainment, luxurious living, and unrivaled attention to detail.

June 28. Embarkation from Hamburg, Germany. Here on the River Elbe is one of Europe's brightest and most exciting cities. Explore the entertainments of the St. Paul district, go sightseeing to City Hall and shopping along the busy Mockebergstrasse, or drive out to the peace and quiet of the picturesque Alster Lakes.

June 30. Molde, Norway. An unusually warm climate graces this delightful Norwegian town, which lies in the path of the Gulf Stream. Of

special note: Romsdal Museum, an open-air compound of carefully assembled wooden houses dating back to the time of the Vikings. Aandalsnes, Norway. This small, picturesque village on the banks of the Rauma River lies below the soaring mountains and tumbling waterfalls of the Romsdal Valley. Ascend Stifjell mountain and cross the lofty bridge over Stigfoss Waterfalls. There are superb views down the Isterdal Valley, a fertile land filled with quiet peaceful farms.

July 3. Magdalena Bay, Spitzbergen. Massive glaciers in Spitzbergen's mountains inch their way down to the sea and Magdalena Bay, providing one of the world's most awesome natural spectacles. Cruising Lillehhok Fjord. Sailing past New Aalesund.

July 4. Longyearbyen, Spitzbergen. This is Spitzbergen's main settlement, located at the head of Advent Bay. It looks out on a coastline of seals, walrus, whales, and thousands of seabirds. Longyearbyen was named by an American engineer who founded it in 1906; the search for coal is still pursued in nearby Barentsburg.

July 5. Skarsvaag, Norway. Here is the most northerly point in Europe. Up the road and across the tundra from Skarsvaag, you will have a rare and awe-inspiring opportunity—a chance to stand on 1,000 ft. cliffs with nothing but polar ice-pack between you and the Arctic Ocean. In the summer, as you shall see, the sun shines all the time—24 hours a day.

July 6. Hammerfest, Norway. The brightly painted houses of the world's most northerly town contrast greatly with the harsh hills which are its backdrop. The attractive little shops offer a wide array of fine crafts, and the Hammerfest Museum records more than 200 years of the town's rich history.

Tromso, Norway. Sheltered by the islands along this craggy coastline, Tromso has long been an important fishing port and the largest city along the Arctic Circle. It was from Tromso that the famous explorer Admundsen staged his great expedition to the North Pole.

July 7. Narvik, Norway. This shipping port along the ice-blue fjords is surrounded by snow-tipped peaks that rival any in the country. Visit the crystal clear Rombaksfjord, which can be crossed via a magnificent new suspension bridge, then continue on to Bjerkvik and Gratangen, where you'll be surrounded by some of northern Europe's most beautiful wildflowers.

July 8. Sailing past the Arctic Circle and several seaside towns.

July 9. Hellesylt, Norway. An excellent starting point for excursions through a land where mountains soar to dizzying heights and waterfalls spread their lacework across the cliffs. Visit the orchards strung together in a brilliant garland of blossoms.

Geiranger, Norway. Geiranderfjord is one of the most splendid in all of Norway, enclosed on both sides by precipitous walls of rock. Visit Geiranger's tiny octagonal church, ascend Mt. Diasnibba and take in a magnificent panoramic view of the mountains, lakes and waterfalls. And save time to visit Tystig branch of Europe's most enormous glacier.

July 10. Bergen, Norway. This town of seven hills was founded in 1070 and is now one of Norway's major seaports. Windows on its past include the 13th-century fortress of Bergenhus, the Rosenkrantz Tower and Edvard Grieg's home at Troldhaugen, while present day Norway is typified by the busy fish and flower market.

July 12. We disembark in Hamburg, Germany.

Bertram G. Woodland, curator of petrology at Field Museum, will accompany the tour. He received his B.Sc. (honors) at the University of Wales and his Ph.D. at the University of Chicago. He will enrich this lovely cruise with his thorough knowledge of the rock formations and geologic history of the fjords, and discussions on the many interesting excursions. Working as a lecturer/tour leader is not a new experience for Bert, as he has escorted Field Museum groups through England and Wales (his native country), Galena, Illinois and several Grand Canyon rafting expeditions.

English Homes and Country Tour

July 1-15

price $2,725 (double occupancy)

England is unique. That it is a land steeped in history, mystery and legend as only antiquity brings is common knowledge, but consider this: it is a country where tea is taken at 3pm and high tea at 6pm, where tea is "cha," but the slang "what cha" means "how are you?" In England, when you tread on someone's toes, they say sorry! and they live in Barking, Shellow Bowells, and Nether Wallop.

Instead of a rushed visit around the whole country the emphasis is on the southeastern counties, where charming thatched villages complement vast cathedrals and living hedgerows set off lush royal gardens. Here, we travel the paths of history and culture exploring many of Britain's "treasure houses," viewing their fabulous private collections within their architectural context and amidst their natural landscapes. Best of all, this tour offers the discriminating traveler an opportunity to experience England through the eyes of the English people who will be our hosts and hostesses. These include baronets, generals, company directors, doctors, members of Parliament, and landowners. Their homes range from mansions to more modest yet extremely comfortable cottages. Accommodations include private bathrooms.

Come and visit this 'tied to the past' yet forward-looking and charming country. Inquire into the customs and foibles of the people as you tour with not only a local guide, but with a scholar from Field Museum, who was born and raised in this remarkable country. Dr. Peter Crane got his Ph.D. in botany at the University of Reading. He is an associate curator in the Department of Geology at Field Museum and was recognized as one of ten "Outstanding Young Citizens" by the Chicago Junior Association of Commerce and Industry in 1985. He is excited about this unusual travel opportunity in his native country and invites you to join him and his countrymen in an exploration of English Homes and Country.

Alaska

$4,885

July 2-16

Experience the Great Land. Descriptions of Alaska are filled with superlatives—a state more than twice the size of Texas with a population less than that of Denver, 33,000 miles of coastline, 119 million acres of forest, 14 of the highest peaks in the United States culminating in Mt. Denali (formerly Mt. McKinley), at 20,320 feet. Alaska is equally a land of wildlife superlatives, from her great herds of caribou to swarming seabird rookeries to surging salmon in migration. When one thinks of Alaska one thinks of wilderness, of nature still fresh and undomesticated, of experiences dreamed of but mostly unavailable to us of the lower 48.

Join us for an Alaskan odyssey through a wide range of habitats from the rockbound fur seal and sea bird colonies of the Pribilofs, to the dripping forest and calving glaciers of the southeast, to the grandeur of the Alaskan Range, to the Fjordlike quiet and beauty of the inland passage.

Our travels will be by plane, train, bus, boat, and foot—whatever best enhances our experience. Emphasis will be on the land, its history, its wildlife. Interpretation combined with direct observation will provide an enjoyment and quality of experience unavailable to the casual visitor. Whatever your interest in natural history—marine mammals, birding, mountains, photography, flowers, forests, glaciers, rivers—this tour will show you Alaska in all its diversity and splendor.

Dr. David Willard, manager of Field Museum's bird and mammal collections, will be tour leader. He received his Ph.D. in Biology at Princeton University, where he was acting curator of Princeton Museum of Ornithology. He has been on a number of research expeditions for Field Museum. His experience in bird and animal identification and his experience as a tour leader will enrich this expedition for you. He invites you to share in the beauty of Alaska this summer.

Grand Canyon Adventures

August 13-22

August 22-31

$1,650

Field Museum Tours is offering two trips to the Grand Canyon in 1986. The first, August 13-22, is a geology study trip hiking down the north rim of the canyon, rafting for four days along the bottom and hiking back up the south riom. The second, August 22-31, is a rafting trip along the entire 300-mile length of the canyon by two motorized rubber rafts. Dr. Matthew H. Nitecki, curator of fossil invertebrates, leads both. A deposit of $50 per person will hold your space.

For further information or to be placed on our mailing list, call or write Dorothy Roder, Tours Manager, Field Museum, Roosevelt Rd. at Lake Shore Dr., Chicago, IL 60605. Phone: 322-8862.

Field Museum of Natural History
Membership Department
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Chicago, IL 60605-2499

FIELD MUSEUM OF NATURAL HISTORY BULLETIN

April 1986

"Cooperation and Conflict in Lion Societies"

Illustrated lecture by Anne Pusey

Saturday, April 26, 2:00pm

See Page 3

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COVER

American bittern *(Botaurus lentiginosus)*. This lifelike diorama is one of 1,200 portable exhibits available on loan to Chicago-area schools. Under the auspices of the Department of Education's N. W. Harris Public School Extension, some 5,000 loans of such portable natural history exhibits were made to schools in the Chicago area in 1985. This community service has been provided by Field Museum for more than 70 years. Photo by Diane Alexander White.

Ninth Annual Spring Systematics Symposium
Saturday, May 10, 8:50am to 4:30pm

This year's symposium topic is "Evolution of Human Hunting" and features ten invited speakers. The pre-registration fee (until April 10) is $10. Registration after that date is $15. Registration forms may be obtained by writing Dr. H. M. Nitecki at Field Museum; they may also be obtained at the Museum on the morning of May 10 before the talks begin.

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Events

"Cooperation and Conflict in Lion Societies"

Anne Pusey

Assistant Professor, Department of Ecology and Behavioral Biology, University of Minnesota

Saturday, April 26, 2:00pm
James Simpson Theatre

Using the diverse environments of Africa's Serengeti National Park and the nearby Ngorongoro Crater, Anne Pusey and Craig Packer are studying how lions, the "superpowers" of the animal kingdom, have evolved strategies for getting along with one another.

Tanzania's Serengeti Plain stretches over 10,000 square miles of temperate highlands, just south of the equator. Vast herds of wildebeest, gazelle, zebra, and eland migrate annually across this plain. All are prey for one of the largest remaining lion populations in the world—more than one hundred lions in an area of about 100 square miles. Drs. Pusey and Packer have spent six months of each of the past seven years observing the ecology and behavior of these fascinating creatures.

Lions are the only social members of the cat family and exhibit a wide range of cooperative behaviors. Lions' basic social unit is the pride—a permanent social group consisting of 2 to 18 adult females and their offspring and 1 to 7 resident males. Prides occupy the same area for generations. The issues studied by Anne Pusey and Craig Packer concern conflict both between and within the sexes. How do the males in a pride cooperate and compete with each other in their quest for females? Why do some males remain solitary, while others find lifetime male companions? What makes groups of males voluntarily abandon a pride and move on to a neighboring pride?

Join us for this richly illustrated slide lecture, as Dr. Pusey explains how the "trade-offs" balancing mutual benefit and individual gain have molded lion societies in east Africa.

Anne Pusey together with Dr. Craig Packer has, during the last seven years, joined a series of scientists who are studying lions in the Serengeti. This research has been continuous for almost twenty years. Dr. Pusey received her M.A. from Oxford University and her Ph.D. from Stanford University. She was research assistant under Jane Goodall at Gombe National Park in Tanzania, studying mother-infant relationships in chimpanzees, and spent three additional years at Gombe studying the adolescent members of this species. In 1978 she was appointed research scientist at the Serengeti Research Institute, also in Tanzania. Since that time the focus of her research has been an ongoing field study of lions in the Serengeti.

Tickets: $6.00 (Members: $4.00)

Fees are nonrefundable. Please use coupon to order tickets. Seating is general admission. Theatre doors open one hour prior to this lecture. Public Programs Information (312)322-8854.

Family Feature

Out of the Night of Darkness: The Maui Legends
Saturdays, April 12 and 19
2:00pm

Some say Maui was born at the edge of the sea, some say he was born fully grown. Some say he can change into many different shapes. Join us at the Maori meeting house for a dramatization of some of the many Maori legends about the clever and amazing Maui.

Monthly Family Features are free with Museum admission and tickets are not required.

Te Maori

Film Program

"Tahere Tiki Tiki, the Making of a Maori Canoe" (30 m.)
April 26 and 27
1:30pm

Explore the superb craftsmanship that goes into the design and production of these seaworthy vessels. This film is free with Museum admission and tickets are not required.

Edward E. Ayer Film Series

Thursdays in April
James Simpson Theatre
1:30pm

April—A selection of films by Japanese Filmmaker Akiro Kurosawa

3	*Seven Samurai*	141m.
10	*Throne of Blood*	105m.
17	*Dersu Uzala*	137m.
24	*Kagemusha*	159m.

CONTINUED →

Events

April Weekend Programs

Each Saturday and Sunday you are invited to explore the world of natural history at Field Museum. Free tours, demonstrations, and films related to ongoing exhibits at the Museum are designed for families and adults. Listed below are only a few of the numerous activities each weekend. Check the *Weekend Passport* upon arrival for the complete schedule and program locations. The programs are partially supported by a grant from the Illinois Arts Council.

April

5 11:00am. *Ancient Egypt* (tour). Explore the traditions of ancient Egypt from everyday life to myths and mummies.

1:00pm. *Spring Wildflowers* (tour). View wildflowers seen in the woods, meadows, and prairies of the Chicago area.

12 12:30pm. *Museum Safari* (tour). Seek out big game from Africa and mummies from ancient Egypt as you travel through Field Museum exhibits.

13 12:00 noon. *Life in Ancient Egypt* (tour). Focus on the objects and practices which illustrate ancient life in the Nile Valley.

19 1:30pm. *Treasures from the Totem Forest* (tour). A walk through Museum exhibits introduces the Indians of southeast Alaska and British Columbia, their totem poles and masks.

20 1:00pm. *Spring Wildflowers* (tour). View wildflowers seen in the woods, meadows, and prairies of the Chicago area.

26 12:30pm. *Museum Safari* (tour). Seek out big game from Africa and mummies from ancient Egypt as you travel through Field Museum exhibits.

27 1:30pm. *Traditional China: the Jades* (tour). Examine the imagery, history and lifestyles represented by Chinese jades and other masterworks.

These public programs are free with museum admission and tickets are not required.

Registration

Be sure to complete all requested information on the ticket application. If your request is received less than one week before a program, tickets will be held in your name at the West Entrance box office. Please make checks payable to Field Museum. Tickets will be mailed upon receipt of check. Refunds will be made only if the program is sold out.

☐ Member ☐ Nonmember

American Express/Visa/MasterCard

Card Number

Signature Expiration Date

Return complete ticket application with a self-addressed stamped envelope to:

Field Museum of Natural History
Public Programs: Department of Education
Roosevelt Road at Lake Shore Drive
Chicago, IL 60605-2497

Name

Address

City State Zip

Telephone: Daytime Evening

"Cooperation and Conflict in Lion Societies"

Member Tickets # Requested	Nonmember Tickets # Requested	Total Tickets Requested	Amount

Stephen C. Simms as a Collector Of North American Indian Material Culture

by JAMES W. VANSTONE
Curator of North American Archaeology and Ethnology

Among early curators associated with the Department of Anthropology, the research of Stephen Chapman Simms was typical. Although not a trained anthropologist, he undertook considerable fieldwork and confronted many of the problems faced by North American ethnographers, particularly those associated with museums, at the turn of the century. This was a time when newly established museums were building their basic collections, and for a museum curator the collection of material objects took precedence over all other aspects of ethnographic research.

Stephen C. Simms joined the staff of Field Columbian Museum (later to be called Field Museum of Natural History) in 1894, during the institution's first year, as assistant curator of Industrial Arts. In 1898, he was appointed assistant curator of Ethnology and was a staff member of the Department of Anthropology for 14 years. The N.W. Harris Public School Extension, forerunner of the Museum's Department of Education, was established in 1912 and Simms was appointed curator of the new department. In 1928, he was selected by the Board of Trustees to be director of the Museum, a position which he held at the time of his death on January 28, 1937.

Stephen C. Simms shown when he was serving as director of Field Museum. 66207-A

At the time of Simms's appointment to the Department of Anthropology, George A. Dorsey was the curator in charge, having joined the Museum staff in 1896. He was to hold that position for 20 years and exerted a major influence on the development of the department and its collections. During his first 10 years at the Museum, Dorsey concentrated on building the North American Indian collections. He accomplished this through a series of expeditions and collecting trips, which he undertook himself or entrusted to various assistant curators, of which Simms was the first. In those days, the curator of a scientific department at Field Columbian Museum had complete charge of all departmental activities. Assistant curators did not simply decide on their own when or where to do fieldwork; they were "dispatched" by the curator.

Simms appears to have made his first field trip for the Museum to the Iroquois on the Six Nations Reserve in Ontario during the fall of 1900. In early January 1901, he was sent to Arizona for three months to collect primarily among Athapaskan-speaking peoples who were not previously represented in the department's collections. With this field trip begins a correspondence between Simms and Dorsey which clearly demonstrates the views held by the latter with reference to the collect-

Beaded shirt collected by S. C. Simms among the Plains Cree in 1903. Photo by Ron Testa. 108675

ing of ethnographic specimens and the assistant curator's struggles to live up to the expectations of his superior.

Simms apparently experienced some difficulties and frustrations during his fieldwork in Arizona. Although expressing determination, he ruefully noted in his letters to Dorsey that his collecting was inhibited by the fact that many families were away from their settlements hunting and that prices were being driven up by commercial curio buyers. Writing from Phoenix on January 26, 1901, he noted that "a peculiar feature of my house to house canvas [*sic*] [among White River Apaches] developed the fact that of my two days [work?] so far I came across but two men in different families and a few things I wanted I could not get because the husband, son or brother was not in and 'he might not like if I sell.'"

In answering this letter, Dorsey, writing on January 31 to Simms who was by then in San Francisco, expressed dissappointment that his colleague did not get to some of the Indian villages in Arizona where he had planned to visit.

> You must remember that in this work there are difficulties and vexations; and delays and disappointments.... Remember that you are after stuff and to get that clean it up and do your whole duty to yourself and to the Museum. You are absolutely compelled to get to out of the way places; to suffer inconveniences and on occasion suffer hardship. When you get into an indian's house and you do not find the old man at home and there is something you want, you can do one of three things; go hunt up the old man and keep hunting until you find him; give the old woman such price for it as she may ask for it running the risk that the old man will be offended or steal it. I have tried all three and have no choice to recommend.
>
> Do not leave anything behind that is to follow or rest content with the statement of some missionary or agent that they will get it for you... but follow it up, get it and bring it back with you by freight.
>
> Please remember this also that I shall expect you on your arrival here to be able to distinguish without the slightest doubt the difference between a Pima and Ute and Walapai and Maricopa and Apache basket and that is in their unfinished condition and want you to buy a [P]apago basket from the Papago Indian and to know that she is actually a [Papago] Indian and she is making the old time Papago basket, etc. I would rather have one good unfinished or brand new basket from any one of the tribes down there that is absolutely identified than any quantity of such baskets as you shipped in by express which were not thoroughly well identified and as you must already know we have a good big bunch of unidentified basketry from the Southwest. All this of course is not in the nature of a reproof or anything of the sort but to stimulate you even to a greater effort and more abundant success. You can easily imagine that I am for very many reasons deeply concerned in the final results of this, your first collecting trip of any series [*sic*] magnitude. Overcome difficulties and make yourself thoroughly master of the situation on this occasion and the west if [*sic*] yours from this time on for a good many years.

George A. Dorsey, who served as curator of Anthropology during the years that Simms was a member of that department. 108072

On his return trip, Simms passed once more through Arizona and on February 2 was the recipient of more collecting advice from Dorsey. He was advised to "clean up" reservations and told that "when you cannot get stuff, get information." A "clean sweep" was important on this trip because Dorsey did not believe that the region was worth a second trip when there were so many areas poorly represented in the Museum's collections.

Two weeks later on February 15, Dorsey gave Simms the benefit of more of his views concerning the role of the field collector.

> The fact that it costs you thirty days to make a trip to find six Indians among which you cannot possibly spend more than $10.00 does not by any means mean that you should not make the trip. On the contrary we often find [it] a most advantageous expenditure [of time and money]. What you pay for the specimen is not what it is worth when it is laid down here in the Museum. The extensions of the idea of our knowledge concerning the artifact or instrument or game may be worth more than money paid, although to make this extension you may have to expend $30 or $40 in personal traveling expenses and perhaps not more than $8 for purchase.

Although over the years Dorsey expressed similar views on ethnographic collecting to a number of col-

One of sixteen war shields collected by S. C. Simms on the Crow reservation in Montana in 1902. Photo by Ron Testa. 11190

leagues and field workers, it would be difficult to imagine a more comprehensive statement of his philosophy, both with reference to collecting methodology and the documentation of collections, than is included in these letters. Although Dorsey seems at times critical and perhaps somewhat overbearing in this correspondence, he and Simms appear to have remained on friendly, if not intimate, terms throughout the 14 years that the latter was a curator in the Department of Anthropology.

In late 1901 and in the summer of 1902, Simms made two collecting visits to the Crow and Cheyenne reservations in Montana. On the second of these trips he made a fine collection of Crow shields, documented with histories, symbolic interpretations, and owners' names. This was one of the most noteworthy additions to the Museum's Plains Indian collections. Simms always regarded this field trip to Montana as his most successful effort as a collector.

Dorsey, on one of his own expeditions to the Southwest in the spring of 1903, left instructions that Simms was to make a trip to the Cree reservations of Saskatchewan during the summer of that year. He apparently left no specific instructions, however, and the assistant curator, perhaps recalling past admonitions, began to worry.

> I find that there are several Cree reservations in Saskatchewan—so please be good enough to indicate (if you can, of course) how many and which ones you intended me to visit. I should like to know this so that I may look up any existing references upon the same. I really fear that my results will not be up to your expectations, or to my work among the Crows—for the number of half breed Crees is astonishing; however, I shall certainly do my utmost to make good my efforts.

Dorsey did not share Simms' concern about the number of half-breeds and believed that there would be much material to collect in the Cree country.

> As I remember the situation, certain reservations, from what I could gather from the Canadian reports, seemed especially promising. Such was the Assanboin [*sic*], south of Indian Head, the reservation north of Broadway [Broadview], two reservations near the Touchwood Hills and several reservations at the Sashatchewan [*sic*] river, around the Battle Ford and Ft. Pit[t]. There are also some lakes still north of this country, Winterhaven [Waterhen Lake, Manitoba?], Meadow, Pelican and Turtle, where may be found a number of Chippewayans [*sic*], who have never been on a reservation, who presumably are fit subjects for you.
>
> I am also under the impression that there are a number of small Sioux reservations, or at any rate Sioux camps, near the Cypress Hills. These reservations should, in my opinion, be exceedingly fertile, but of course it is all a gamble and the only way we can find out

what is up there is for a good man like yourself to make the trip.

It is clear from this letter that Dorsey gave considerable thought and study to areas where he wished to have materials collected in advance of sending collectors into the field. It could not have been easy, at the beginning of this century, to find detailed and accurate information on the Indians of the Canadian prairies.

Simms had hoped to leave for Saskatchewan around June 1, 1903, but he was delayed and finally departed on or about August 3, an unfortunate delay as it turned out. Dorsey had confirmed that Simms would not be able to leave as soon as he had hoped.

> I realize that should you not get started until some time in July, it would hurry you to make the grand trip I have just been talking about, but in this case you would necessarily be governed by circumstances, penetrating as far north as time and money would permit. Should we find after a trail [*sic*] of some of the Cree reservations that they were extremely profitable, I think it would be an easy matter to secure an appropriation for a return next year.

On August 20, Simms wrote to Dorsey from the Qu' Appelle Indian Agency in southern Saskatchewan.

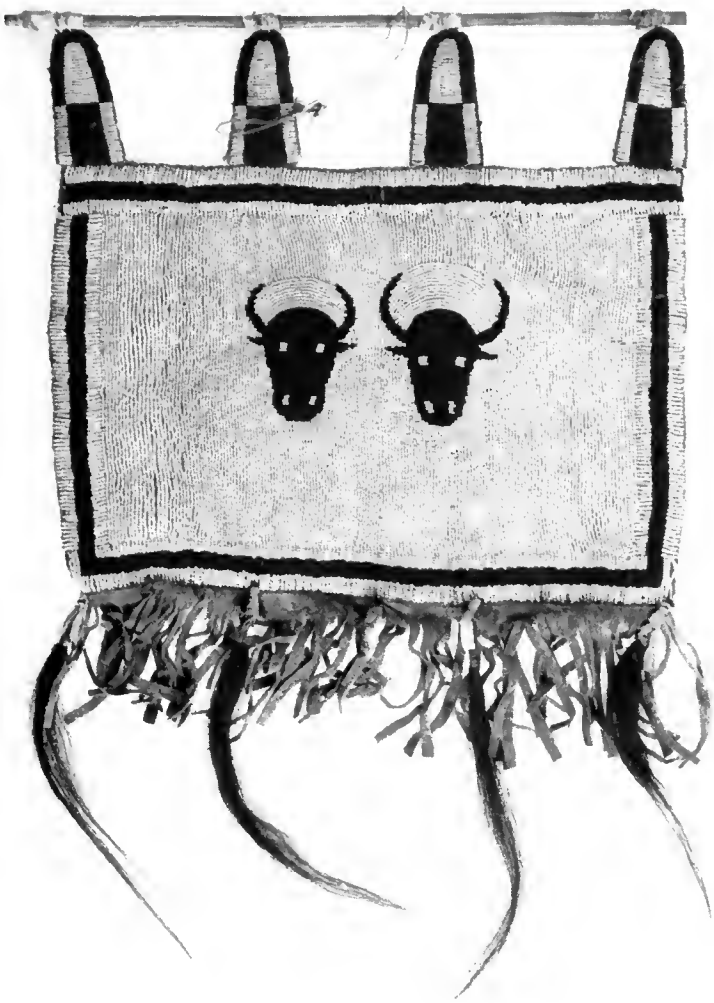
> This country must have been visited by a cyclone or a disastrous fire or by both—and confined their efforts to Indian material. Have visited reserve after reserve, tipi after tipi but can't boast of anything to be chesty about.
>
> The Indians thru this section are devoting their time to farming and they expect to unload about 100,000 bushels of wheat. After I leave here I take the train at a station not far from a small settlement of Assiniboines, and tho they were not considered to be on my itinerary I had thought it advisable to go there—there is a much larger band further east, hard to get at, but can't spend the time or money unless authorized to do so.

Unfortunately, Simms' troubles were just beginning. On September 12 he informed Dorsey that he had

> Just returned from Crooked Lake Res. thru a howling blizzard, foot of snow, telegraph wires down, trains [delayed?] and I'm in the dumps.
>
> My trip here was put off too late. They are farming and have [taken?] their tipis with them. Houses boarded up. I have done the country but my results are not as I desired. There was one place I was unable to reach—Nut Lake. Roads were impassable and no camping place or outfit.
>
> I fervently believe that I have not had a week of good weather all told.
>
> I have done more sleeping on floors, in lofts, in [lousy?] blankets, than on any previous trip—tho I am feeling well and would feel a —— sight better if I could pick up a few... specimens.

The same problems continued to plague Simms, as he noted in his next letter to Dorsey written on September 21.

> This, as I have said before, is a bad time to come here. Most of the Indians are farmers and they have been working in the fields and living in tents. There are hardly any accomodations for one to stay a week, on any of the reserves here.
>
> I feel confident that with the knowledge I possess, I do better the next time by omitting places, and getting



Beaded panel hung as decoration from a back rest. Collected by S. C. Simms among the Plains Cree in 1903. Photo by Ron Testa. 119801

here before the harvesting of hay and grain starts.

I have done pretty thoroughly about 12 reserves, and with poor results. Have seen no very good specimens. Plenty of Hudson's Bay things etc. but not much of the things to make your heart glad. Until a few days ago, have had rain, snow and hail and travelling in this country has been wretched.

Was greatly disappointed in not being able to get to Nut Lake country—from the little I have seen they are the best, and had the country been at all passable should have made it.

Remember this. The time to get to these places is 'Treaty time' early June.

Although Simms may have visited 12 reserves, as he says, he appears not to have travelled much beyond those reserves clustered in the southeast corner of Saskatchewan. Nut Lake, which seemed like a panacea to the weary ethnographer as he struggled with the snow and bad weather in the south, is east of Saskatoon in country occupied by the Plains Ojibwa. Simms was doubtless correct in assuming that "Treaty time" would be the ideal time for collecting, at least in terms of finding the maximum number of Indians congregated in one place. Once each year the Indians of each reserve gathered to receive the cash payments due them under the terms of their treaty with the Canadian government.

Simms left the Plains Cree country shortly after writing the letter just quoted. On September 23 Dorsey had suggested in a telegram that Simms collect in northern Minnesota on his way home and although there is no related correspondence, he apparently spent a month on the Leech Lake Ojibwa reservation, near Bemidji.

Although Simms later carried out fieldwork in the Philippines, which included recovering the body and field notes of Curator William Jones, murdered by the Ilongot of Luzon Island in 1909, his trip to Saskatchewan was his last North American field trip. In June 1907, Simms received an invitation from the "Inspector of Indian Agencies of Northwest Canada," apparently someone he had met during his fieldwork, to accompany him to reservations in central Saskatchewan. In a memo requesting permission to make this trip, he reminded Dorsey that he had not been able to reach this area on his previous trip. Dorsey, however, refused permission for the trip on the grounds of lack of funds.

Several things are apparent from this correspondence between Simms and Dorsey. First of all, the primary objective of field workers in the early years of the century was to fill gaps in the collections. Dorsey was determined that along with the ethnographic objects collected, as much documentation as possible should also be obtained to enhance their scientific value. Neither he nor Simms appear to have been interested in acquiring objects that showed the influence of European contact. Above all, it is clear that Dorsey expected results and was not overly concerned about how they were achieved. Simms and his colleagues in the department did their best to live up to his expectations.

NOTE

This article was adapted from J. VanStone, "The Simms Collection of Plains Cree Material Culture from Southeastern Saskatchewan" (*Fieldiana: Anthropology*, new series, no. 6, 1983). Most of the information was obtained from correspondence files in the Department of Anthropology and from Annual Reports of the Museum. An obituary of Simms appeared in *Field Museum News*, vol. 8, no. 3, 1937. For an excellent overview of the history of Field Museum's North American Indian collections, see P. Rabineau, "North American Anthopology at Field Museum of Natural History" (*American Indian Art Magazine*, vol. 6, no. 4, 1981, pp. 30-37, 79).

SPRING WILDFLOWERS OF THE CHICAGO AREA

by **FLOYD A. SWINK**

Photos courtesy of the author
except where indicated

Great diversity is to be found in the wildflowers of the Chicago area. Certainly one of the most interesting times to see these flowers is in the spring, especially in wooded areas. Flowers like sunlight, and the plants bloom before the leaves appear overhead; so the forest floor at this time of year has a plenitude of sunlight. This means that many kinds bloom at about the same time, and a trip to the same forest in July or August would reveal hardly any blooms in the dense shade.

There are many woods and parks in the Chicago area in which to see the wonderful spring flowers, and five of the most important areas are discussed here: Warren Woods, Indiana Dunes State Park, Morton Arboretum, Starved Rock State Park, and Illinois Beach State Park.

Warren Woods. This fine botanical area is located along the Galien River in Berrien County, Michigan (the county closest to Chicago in the state of Michigan). By taking an east-west road about halfway between the Michigan towns of Union Pier and Lakeside, and proceeding about three miles directly eastward, this beautiful forest comes into view. It has been little disturbed, and is a fine example of beech-maple forest; the trees are much taller than those on the Illinois side of the lake, and a walk through the area even when flowers are absent is impressive. About April 30 is a good time to visit.

Indiana Dunes State Park. Spring hikes on the open dunes yield little in the way of wildflowers, but behind the dunes are swamp forests, which are fine. One of the best routes is the trail heading immediately eastward from the open field located to the east of the Wilson picnic shelter. The trail then turns northward and heads through a diversified forest (the trail often wet in spring!), with many tree species and delightful wildflowers.

Morton Arboretum. While much of the Arboretum (in Lisle, Du Page County, about 25 miles west of the Chicago Loop) is devoted to the culture of cultivated woody plants, the east-end forest is excellent for spring wildflowers. A portion of these woods is dominated by sugar maple, and species such as toothwort, spring beauty, false rue anemone, white trout lily, rue anemone, and hepatica grow in abundance.

Starved Rock State Park. The topography here (about 75 miles southwest of the Chicago Loop) is more rugged than in our standard forest preserves, but this in itself adds to the diversity. The park is excellent for ferns, many of them growing on the rock cliffs, but also is noted for fine wildflowers. Some of these occur in the extra shade in or near the canyons, a good example being Dutchman's breeches near French Canyon.

Floyd A. Swink is a taxonomist at Morton Arboretum, Lisle, Illinois, and has served as lecturer and tour leader of Field Museum botanical field trips in the Chicago area.

May flowers in Morton Arboretum. Pink-streaked white flowers are spring beauty (Claytonia virginica). *Also shown are the blue violet* (Viola papilionacea) *and the yellow violet* (Viola pensylvanica). *Photo by John Kolar.*

Illinois Beach State Park (east of Zion, Illinois). This should be visited in late spring—around Memorial Day is best. The area is more of a prairie park. Prepare for cold weather, even in late May, as the northeast winds off the lake can be quite uncomfortable. The area near the lake is dominated by a scrubby black-oak forest, but the prairie areas west of this forest are beautiful in late May and early June. Sand dunes are not high here, because the dominant westerly and northwesterly winds are blowing from the land out over the water. (In Indiana and Michigan these same winds help to accumulate sand from Lake Michigan onto the nearby shores.)

Microclimatic conditions influence our local area significantly, and an interesting project is to study our tree distribution as affected by Lake Michigan and by local winds, rainfall, and snowfall. For example, southern trees (sassafras, papaw, sour gum, and flowering dogwood) are found in the Indiana dunes and commonly in southwestern Michigan, yet are hardly ever found in Lake County, Illinois, or in adjacent Wisconsin. Interesting exceptions include the sour gum, which occurs in Kenosha County, Wisconsin—the only place in the entire state! Sassafras formerly occurred in the same county, but is now being exterminated in Wisconsin. I remember a sassafras colony of three trees in the area near Lake Michigan adjacent to Kenilworth and Wilmette, but this has been gone for many years. Sassafras still occurs wild in southern Cook County. Papaw does get to southern Cook County and southern Du Page County—quite a contrast to its abundance much farther north in Michigan. Perhaps one can draw from all this the reasons why we are able to grow abundant crops of peaches and sweet cherries in southwestern Michigan, but not in Wisconsin directly across the lake.

Some of the more interesting wildflowers of spring are discussed below, the woodland species first and prairie species last.

❀ SPRING BEAUTY (*Claytonia virginica*)
Purslane Family (Portulacaceae)

This is probably the most abundant of our native woodland wildflowers. It is a perennial which possesses an ample storage root, giving it the ability to get an early start the following spring. It also can stand quite a bit of abuse. The ultimate example of such abuse may be observed when wooded property is acquired and the oak trees are allowed to stand, but the rest of the area is made into lawn. The spring beauty is usually the only wildflower to remain, and it forms dense stands competing with the grass, often in circular patches which follow the contours of the oak trees above. It occurs in almost every wooded area in the Chicago region, but the greatest abundance is on the Illinois side of the lake. Typical associates include the white trout lily, white oak, hepatica, May apple, and woodland phlox.

❀ VIOLETS (*Viola spp.*)
Violet Family (Violaceae)

Our spring woodlands contain a number of interesting violets, some very closely related to each other. These include the common blue violet, *Viola papilionacea* (with smooth foliage) and the hairy wood violet, *Viola sororia* (with hairy foliage). There are also two yellow violets, *Viola pensylvanica*—also known as *Viola eriocarpa*—with relatively smooth stems, and *Viola pubescens*, with definitely hairy stems. Unfortunately, in both of these groups intermediate specimens occur which can be perplexing. In the meantime, many areas of dune landscapes become attractive with the beautiful blossoms of the bird's foot violet, *Viola pedata*. One of the most unusual violets occurs in the beech-maple forest at Warren Woods, and is known as the long-spurred violet, *Viola rostrata*. As the common name implies, the floral spur which is characteristic of violets as a group is considerably longer in this species than is the case with our other common violets.

White trout lily

❀ **White Trout Lily** *(Erythronium albidum)*
Lily Family (Liliaceae)
This plant forms circular colonies in the woods. Plants with single leaves are nonflowering, and those with two leaves bear flowers. Most specimens in a given colony are not old enough to flower. The flower color is usually white, but in our area the flowers often have a slight bluish tinge. The leaves are more or less spotted (hence the name trout lily). Another name, dog-tooth violet, is inappropriate, since the plant, a member of the lily family, is not a violet. Locally, it is most common on the Illinois side of Lake Michigan. The white trout lily quite consistently associates with the spring beauty, discussed above.

Yellow trout lily

❀ **Yellow Trout Lily** *(Erythronium americanum)*
Lily Family (Liliaceae)
This trout lily differs from the foregoing plant not only in the yellow color of the flowers, but also in the greater amount of spotting on the foliage. Its local center of distribution is northwestern Indiana and southwestern Michigan, especially Warren Woods, where it quite completely replaces the white trout lily. Typical associates include sugar maple, beech, Dutchman's breeches, squirrel corn, large-flowered trillium, and wild geranium.

Hepatica

❀ **Hepatica** *(Hepatica acutiloba)*
Buttercup Family (Ranunculaceae)
Most of our hepatics, especially on the Illinois side of the lake, are this species, which grows in neutral or slightly alkaline soil. Another species *(Hepatica americana)* occurs more commonly in the acidic soils of the Indiana dunes, and is told from *acutiloba* by the rounded lobes of the leaves; in *acutiloba* these are pointed (some botanists regard both as varieties of the European species). The plants are early blooming (in fact often the earliest wildflower in the woods), and are quite attractive, especially since the color is so variable — from white through pink and rose to dark lavender or violet. The leaves of the previous year are semi-evergreen and often remain the following spring, with the newly developing fuzzy leaves of the current year appearing at the same time.

❀ **Toothwort** *(Dentaria laciniata)*
Mustard Family (Cruciferae)
This is our only spring woodland wildflower combining the four petals of the mustard family with deeply dissected, or compound, leaves with narrow leaflets. This is an especially common plant in the east woods of the Morton Arboretum. Flower color ranges from pure white to a light pink or purple. Another related plant sometimes grows with it, having identical flowers but undivided leaves; this is the purple spring cress ((*Cardamine douglassii*) Toothwort associates typically with red trillium, spring beauty, white trout lily, wild geranium, hepatica, woodland phlox, and May apple.

Toothwort

Dutchman's breeches

Wild geranium

❀ **Wild Geranium** (*Geranium maculatum*)
Geranium Family (Geraniaceae)
This is one of our commonest woodland wildflowers, also known as wild cranesbill. Its flowers are showy, pink or rose-purple, and about an inch in diameter. When flowers are not present, it is easy to confuse the foliage with that of certain anemones. Its associates quite consistently include woodland phlox and Virginia waterleaf.

❀ **Virginia Waterleaf** (*Hydrophyllum virginianum*)
Waterleaf Family (Hydrophyllaceae)
The common name is given because of the whitish spots on some of the leaves, which at a distance, resemble drops of water. The name *Hydrophyllum* is derived from the Greek for "water" and "leaf." It is our only common spring woodland wildflower in which the stamens noticeably protrude from the corolla. Flower color can range from pure white to light pink and/or light purple.

❀ **Woodland Phlox** (*Phlox divaricata*)
Phlox Family (Polemoniaceae)
This blooms slightly later than the plants discussed above, and has bluish-purple blossoms with the shape of those of our cultivated phlox. The plant typically has sterile, or nonflowering, basal shoots along the ground, which can take root. It consistently associates with the wild geranium and the Virginia waterleaf, and is to be found in almost every woodland, unless the area is badly disturbed.

❀ **Dutchman's Breeches** (*Dicentra cucullaria*)
Fumitory Family (Fumariaceae)
This is a rather delicate plant, and unlike the spring beauty, will not tolerate heavy abuse in the woods. The white flowers occur in clusters, and are shaped like trousers hanging upside down, thus easily distinguished from anything in the woods. When not in flower, the plant can be confused with the closely related squirrel corn (see below). Dutchman's breeches typically grows with spring beauty, false rue anemone, bloodroot, wild leek, and white trout lily. It is especially delightful in French Canyon of Starved Rock State Park.

❀ **Squirrel Corn** (*Dicentra canadensis*)
Fumitory Family (Fumariaceae)
The foliage of this plant is almost identical to that of Dutchman's breeches. However, the squirrel corn possesses small tubers that approximate the size, shape, and color of a kernel of corn; thus, quite different from the tubers of Dutchman's breeches. While Dutchman's breeches ranges throughout our area, squirrel corn is more at home in the beech-maple forests of our Indiana and Michigan sectors. In fact, at Warren Woods, it is one of the showpieces of the forest, in a normal spring blooming about May 1. It grows there abundantly with Dutchman's breeches, giving an excellent opportunity for first-hand comparison. Interestingly enough, the two plants are sometimes called "boys and girls"; the boys represented by the Dutchman's breeches and the girls by the heart-shaped flowers of squirrel corn.

Squirrel corn

Bloodroot

❀ BLOODROOT *(Sanguinaria canadensis)*
Poppy Family (Papaveraceae)
This is one of the delights of an early spring hike in rich woods. It is one of our few wildflowers which typically has eight petals. The petals are attached only slightly to the floral receptacle, so that after a good wind or rain the petals are on the ground, giving a relatively short life to the flower. Most parts of the plants have an orange-red juice, giving the common name. It is a member of the poppy family, whose members are often characterized by a colored juice. Bloodroot typically associates with sugar maple, red oak, spring beauty, Dutchman's breeches, toothwort, wild geranium, and hepatica.

❀ JACK-IN-THE-PULPIT *(Arisaema atrorubens)*
Arum Family (Araceae)
Sometimes this plant is considered to be the same species as one occurring farther east, in which case the scientific name becomes *Arisaema triphyllum*. It is easily identified from anything else in our area by the striped green hood which arches over a club-shaped organ (the "jack") known as a *spadix*. At the bottom of this spadix occurs the tiny flower (either male or female). We are more familiar with the plants in the cool spring season than in the warmer season to follow; the relatively non-showy flower is well known, but the brilliant red fruit clusters occurring later in the season are less familiar.

❀ MAY APPLE *(Podophyllum peltatum)*
Barberry Family (Berberidaceae)
The name of this plant is misleading, as it implies the fruit ripes in May; actually it ripens much earlier. It is the *flower* which is observed in May, and it is often missed on spring hikes because it hides under the two "umbrellas" which are so familiar in the woods. Plants with a single umbrella-leaf do not flower. The flowers are large, more than two inches across, white, and with an absolutely delightful fragrance reminding one of fresh fruit. The colonies are circular, and spread outward each year; it would be interesting to determine how rapidly a colony enlarges from year to year. The may apple has long been used in folk medicine for a variety of complaints; recently extracts of the plant have been shown to inhibit the growth of certain tumors in laboratory animals.

Jack-in-the-pulpit (fruit)

Jack-in-the-pulpit

May apple

Wild columbine

❀ **Wild Columbine** (*Aquilegia canadensis*)
Buttercup Family (Ranunculaceae)
The flowers are similar in shape to those of the familiar columbine of the gardens; however, the wild columbine is red or orange (with some yellow). It is a favorite species for the visits of the ruby-throated hummingbird. The petals are hollow, and the flower hangs upside down. It is most delightful to see this plant blooming on rock cliffs (for example, at Apple River Canyon in northwestern Illinois). However, this habitat is locally rare, so most of our specimens are seen in woods, especially woods of the Indiana dunes, where it occurs with black oak, wild sarsaparilla, choke cherry, sassafras, witch hazel, and cat brier. The foliage is often attacked by a leaf miner, which makes characteristic serpentine lines in the leaves.

❀ **Swamp Buttercup** (*Ranunculus septentrionalis*)
Buttercup Family (Ranunculaceae)
There are many buttercups in our area, but this is the showy one commonly seen in spring woodlands, especially along flood plains, where it associates with silver maple, white ash, American elm, wild ginger, wood nettle, and golden Alexanders. After flowering, it sends out conspicuous runners, or stolons. The flowers are a brilliant shiny yellow, hence "buttercup." The leaves are compound, thus enabling the naturalist to easily distinguish the swamp buttercup from the closely related marsh marigold.

Swamp buttercup

❀ **Hoary Puccoon** (*Lithospermum canescens*)
Borage Family (Boraginaceae)
This orange-flowered plant is a distinctive member of our prairie flora. Remember that the spring prairie plants bloom somewhat later than their counterparts in the forest, so that late May or early June would be a good time to see the prairie in bloom. Hoary puccoon has a showy relative which is found in both the Illinois and Indiana dunes, fairly close to Lake Michigan. This is the hairy puccoon (known variously as *Lithospermum croceum* and *Lithospermum caroliniense*). It is a rougher plant and grows somewhat taller, but is usually easily distinguished by the difference in habitat.

Hoary puccoon

❀ **Marsh Marigold** (*Caltha palustris*)
Buttercup Family (Ranunculaceae)
This is a very common plant of wooded dune marshes, especially in Indiana and Michigan, where it consistently grows with the very early-blooming skunk cabbage. Marsh marigold's leaves are rounded but never divided, thus easily distinguishing it from the common showy buttercups. It is native to Eurasia as well as to America. Despite its name, the plant is not even closely related to the cultivated French and African marigolds (which are natives of Mexico!).

Marsh marigold

Prairie phlox

❀ **Prairie Phlox** (*Phlox pilosa*)
Phlox Family (Polemoniaceae)
Woodland phlox, already mentioned, has bluish-purple flowers. The prairie phlox, however, bears pink or rose-colored flowers, often quite showy. Furthermore, the prairie habitat would distinguish it from the woodland phlox. Prairie phlox is rather hairy, and thus easily distinguished from a later-blooming plant of our prairie marshes, *Phlox glaberrima,* the marsh phlox. Prairie phlox occurs with shooting star, hoary puccoon, yellow star grass, and blue-eyed grass, forming a delightful prairie association in a number of our areas.

❀ **Yellow Star Grass** (*Hypoxis hirsuta*)
Amaryllis Family (Amaryllidaceae)
This is our only locally native member of the Amaryllis Family. Despite its name, it is not a grass, but rather has a delightful, albeit small, yellow flower. It can be easily found by locating patches of shooting star in bloom. When not in flower, it can be told from blue-eyed grass by the hairiness of its foliage. Blue-eyed grass has smooth leaves.

❀ **Shooting Star** (*Dodecatheon meadia*)
Primrose Family (Primulaceae)
Although this is primarily a prairie plant with us, flower enthusiasts in other geographical areas see it primarily as a woodland plant. There are excellent places to see shooting star in good abundance. One is at Illinois Beach State Park, in the prairie portion west of the scrub-oak forest. Another fine locale (flowering around Memorial Day) is the Chiwaukee Prairie in southeastern Wisconsin, near Lake Michigan, north of the Illinois town of Winthrop Harbor, in an area east of the Northwestern railroad tracks. Here there are acres of fine shooting star populations, associating with prairie phlox, yellow star grass, blue-eyed grass, wood betony, and hoary puccoon.

❀ **Blue-Eyed Grass** (*Sisyrinchium albidem*)
Iris Family (Iridaceae)
Despite the name, our plants are often white-flowered, although beautiful blue or violet ones can also be found. The plants have flattened winged stems, and associate with another small member of the flora, yellow star grass, discussed above. Again, we are not dealing with a true grass, but this time with a member of the iris family.

❀ **Wild Ginger** (*Asarum canadense*)
Birthwort Family (Aristolochiaceae)
This curious plant grows along the flood plains of our wooded streams, associating with swamp buttercup. The leaves are large, somewhat heart-shaped or kidney-shaped, and hide the curious flowers, which grow at ground level or slightly above it. The flowers are three-parted, somewhat brownish-purple, and much smaller than the leaves. Flowering plants are commonly not observed as such, because of the density of the leaves. Pulling the foliage aside enables the observer to see the flowers described above. The plants form low-growing circular colonies, and when once learned, are unmistakable. They are not even closely related to the true ginger used in cooking.

Wild ginger

While the wildflowers are the showpieces of the spring woods, it is also true that sometime during spring most of the trees bloom as well. Normally the flowers of trees are not showy, and are missed by most spring hikers for this reason, plus the fact that the flowers are usually some distance above the observer. A challenge this spring would be to try to see the common trees of our forest preserves when in flower, including such common species as silver maple, American elm, white ash, hop hornbeam, hackberry, sugar maple, white oak, and red oak. **FM**

Ninth Annual Spring Systematics Symposium
Saturday, May 10, 8:50am to 4:30pm

This year's symposium topic is "Evolution of Human Hunting" and features ten speakers. The preregistration fee (until April 10) is $10. Registration after that date is $15. Registration forms may be obtained by writing Dr. H. M. Nitecki at Field Museum; they may also be obtained at the Museum on May 10 before the talks begin.

Robert H. Denison

1911–1985

Robert H. Denison, former curator of Fossil Fishes at Field Museum, died after a long illness in September 1985. He was a first rate scientist, a paleoichthyologist (specialist in fossil fishes) of international stature.

Born in Somerville, Massachusetts, on Nov. 9, 1911, he graduated from Harvard College with an A.B. in 1933. From there he went to Columbia University, where he also became well acquainted with the staff of the American Museum of Natural History. Bob completed his studies at Columbia with a M.A. in 1934 and a Ph.D. in 1938. A student of the world-renowned comparative zoologist William K. Gregory, Bob started his career interested in fossil mammals. His Ph.D. thesis on the broad-skulled Pseudocreodi (a primitive mammalian carnivore) was awarded an A. Cressy Morrison Prize in Natural Science in 1937 by the New York Academy of Science. In the early 30s he joined Harvard field parties to collect fossil mammals in Wyoming, Nebraska, and South Dakota, and in 1947-48 he took part in a University of California expedition to Egypt and Kenya.

In 1937 Denison became a member of the faculty at Dartmouth College and assistant curator of the Patten collection (now at the American Museum), which contained Late Devonian (350 million years before present) and Late Silurian (400 MYBP) vertebrates from Quebec and the Isle of Oesel in the Baltic Sea. William Patten (formerly professor at Dartmouth) had collected this material to support his ideas about the origin of the chordates from arthropods. This large resource channeled Bob's paleontological interests in the direction of the early vertebrates and resulted in a series of careful descriptions of agnathans (jawless fish) and placoderms (a large extinct group of armored fish).

In 1948 he joined the Field Museum as curator of Fossil Fishes, and began to build a collection of North American Devonian and Silurian fishes. Besides the anatomy, classification, and evolutionary history of the early vertebrates, Denison was deeply interested in the ecology of the earliest groups and the origin and early history of their calcified skeletons. The prevailing and widely accepted theory at the time held that the earliest vertebrates were freshwater inhabitants and that some of them later invaded the sea. Denison had visited and collected in most of the North American localities of early vertebrates and found that he could not agree with this view. As the recipient of a Guggenheim Fellowship (1953-54), he also visited localities in England, Scotland, Norway, and Sweden, and in the process discovered evidence against the freshwater origin theory. In 1956 he published a detailed review of the evidence regarding the habitat of the earliest vertebrates and concluded that they inhabited marine, rather than fresh waters.

When Bob joined the staff, Field Museum had virtually no fossil fish collection; by the time he retired, at the end of 1970, the institution had one of the most important and best curated collections of Devonian and Silurian fishes in the world. Much of what Bob collected, he also studied, and the results are published in a series of major, technical accounts.

In 1963, he discovered the earliest North American lungfish in the Lower Devonian of Cottonwood Canyon, Bighorn Mountains, Wyoming. It still is the only complete Lower Devonian lungfish known. This is the only fish group that led him out of the Devonian (345-395 MYBP) into the mid-Pennsylvanian (295 MYBP) of Illinois, and the study of tooth histology of younger lungfishes. His specialty, however, was working with agnathans and placoderms; his last two studies on placoderms appeared in 1984 and 1985.

For the well-known series, *Handbook of Paleoichthyology*, he gathered extensive knowledge on the placoderms (1978) and the acanthodians (1979). These two volumes of the series are used extensively by paleoichthyologists around the world.

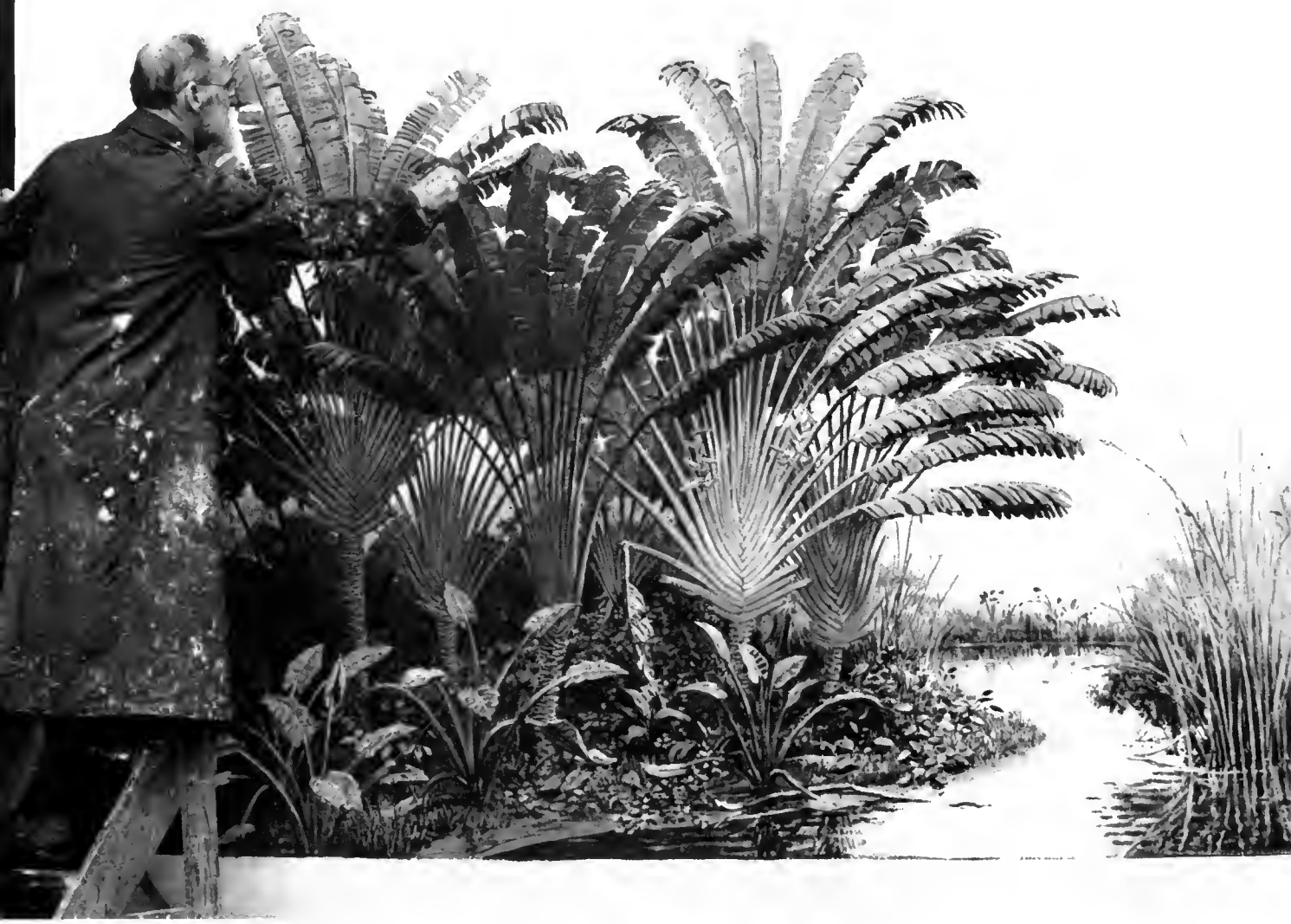
Denison was a Fellow of the Geological Society of America and a member of the American Society of Vertebrate Zoologists. He was an honorary member of the Society of Vertebrate Paleontology, serving as its secretary-treasurer from 1959 to 1961, and as president in 1961 and 1962.

Bob Denison was a quiet, well-liked and much respected colleague, devoted to his scientific and curatorial responsibilities. He personified all the best character traits of the New Englander he was: love for privacy and independence, conscientiousness and sustained effort in his work habits, strong need for orderliness, wry sense of humor, valuation of substance over imagery and absolute honesty.

Following retirement, Bob and Mary Denison moved to Lincoln, Massachusetts, where Bob became a research associate at the Museum of Comparative Zoology, Harvard University, and continued his scientific work.

Bob is survived by his wife Mary, three sons, John H. Denison, David O. Denison, and Robert Wells, and a sister, Mrs. Merdecai-Fischerman.

—Rainer Zangerl, Curator Emeritus, Department of Geology, and William D. Turnbull, Curator, Department of Geology



Charles Abel Corwin works on mural of "Traveler's Tree," now on view in Plants of the World Hall. B78689

PAINTERS AT FIELD MUSEUM

a look at the men and women who created the museum's habitat backgrounds and murals

by David M. Walsten

In the late 1890s something new began to happen in the way museums exhibited natural history specimens. It had been the convention to place them on view in an unadorned, regimented fashion—not unlike rows of canned goods in a grocery store. Then the diorama came into vogue as a device for displaying specimens in realistic settings.

Commonly, these dioramas included painted backgrounds, most often on curved walls, that attempted to blend imperceptibly into three-dimensional forms

in the foreground. Whether this ploy was always effective is a moot point, but these backgrounds called for painting skills of the highest refinement, to say nothing of a sharp eye for representing the various forms of nature.

An artist who possessed such skills and was blessed with such an eye was Charles Abel Corwin (1857-1938), who served as Field Museum's staff artist from 1903 to 1938, when he died at the age of 81. During this period, Corwin painted more than 80 diorama backgrounds and murals, as well as a large number of conventional-size canvases featuring botanical subjects. Many of his larger works are still on public view in the Museum's halls, while his smaller canvases are hanging in various locations in the Department of Botany.

A native of New York City, Corwin began his art studies there in 1875, following this with several years at the Royal Academy of Munich and tutelage under Italian masters. In 1883 he joined the faculty of the School of the Art Institute of Chicago. At the same time he continued with his own painting and his work was shown in numerous exhibits. While most of Corwin's work in the realm of natural history is to be found at Field Museum, he is also represented by habitat backgrounds in the American Museum of Natural History, New York; in the Los Angeles County Museum of Natural History; and the California Academy of Natural Sciences, San Francisco. The total corpus of his work must constitute one of the major achievements in American landscape art, though most of it has been accessible only to the museum-goer.

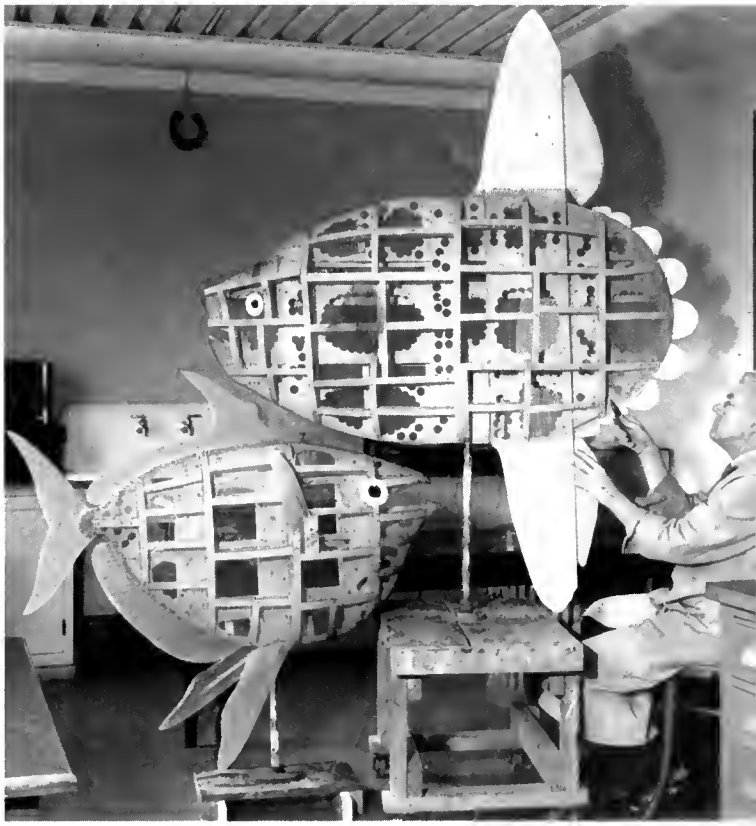
Upon his death, Corwin was succeeded as staff artist by Arthur George Rueckert (1891-1948), who had joined the Field Museum in 1923 as taxidermist-preparator in the N. W. Harris Public School Extension. (Earlier he had been with a firm of commercial taxidermists, the Illinois Department of Agriculture, and the Chicago Academy of Sciences.) Shortly after joining the Field Museum, Rueckert transferred to the Division of Taxidermy of the Department of Zoology and, in addition to his work in the building, he participated in a number of expeditions and field trips as a collector, notably with the Second Rawson-MacMillan Subarctic Expedition of 1927-28. Among the backgrounds he painted were those for habitat groups featuring penguins (begun by Corwin), Weddell's seals, alpine plants, Bahaman reef, crocodiles, intertidal reef, and a great many bird dioramas. Rueckert died suddenly in 1948, in mid-career, while still an active staff member.

The work of Corwin and Rueckert together accounts for the overwhelming majority of the Museum's habitat backgrounds. They also did eleven 8-by-10 murals hanging in the Plants of the World Hall. (An additional one of the set of twelve botany murals was done in 1956 by John Pfiffner, an artist who is best known for his technical drawings of monkeys and other animals for scientific publications.)

Maidi Wiebe (FM1951-1962) and John Conrad

Arthur George Rueckert adds finishing touches to background of alpine habitat group in Plants of the World Hall (1938). Emil Sella, curator of exhibits for Botany, is at right. B360377

Artists at work: John Conrad Hansen (left), Alfred Lee Rowell (lower left), and Maidi Wiebe (below). G78636, GN83157, 81270



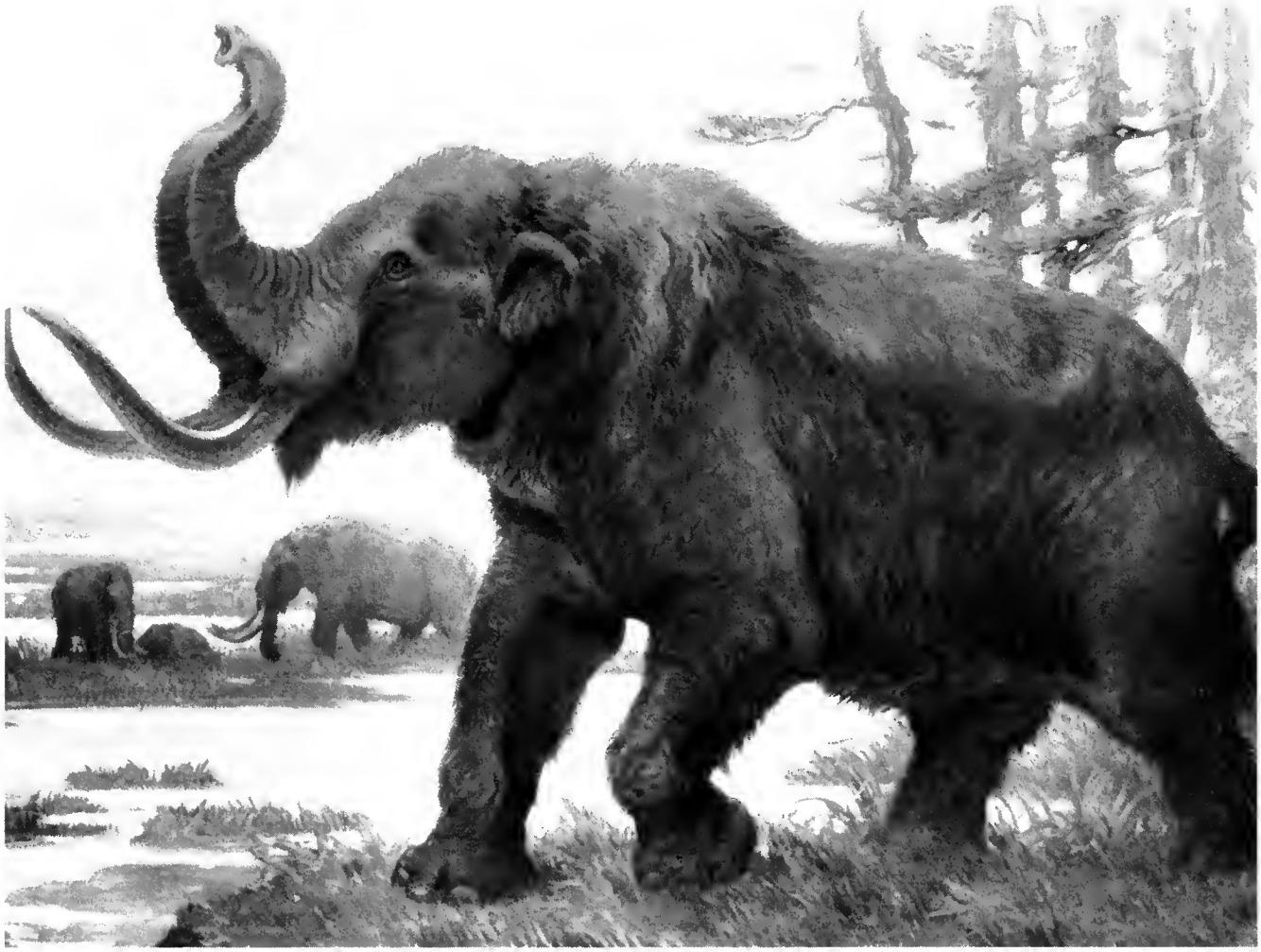
Top left: Proboscis monkey diorama, background painted by Leon Pray. Above: Pray painted a few habitat backgrounds, though he is best known for his taxidermy and models; here he prepares sunfish models. Below: Marion Pahl, a versatile artist skilled in whimsical cartoons as well as technical drawing, works on mural of Chinese mythological figure. 78576, 82943, 81139a

Hansen (1869-1952, FM1940-1952) served as artists for the Department of Geology. Miss Wiebe (now Mrs. Leibhardt) did a large number of backgrounds, particularly of prehistoric life. Mr. Hansen painted various backgrounds that are now on view in the Fossil Shells and Plants Hall and the Dinosaur Hall. He came to the Museum at 70 years of age after completing a successful career as a lithographer and engraver.

A few habitat backgrounds in the zoology area were done by Leon Pray (FM1901-1947), who was best known as a taxidermist and model-maker. Pray's backgrounds included those for the orangutan, proboscis monkey, manatee, and leopard. A few backgrounds were also done by Douglas E. Tibbitt (FM1948-1955), notably Marsh Birds of the Upper Nile. Backgrounds in the American Indian halls were done by Gustaf Dahlstrom (FM1943-1971), Alfred Lee Rowell (FM1941-1963), and Theodore Halkin (FM1961-1969).

Marion E. Pahl (FM1956-1969), who served the Museum variously as artist (Department of Zoology), illustrator (Photography), and scientific illustrator (Department of Exhibition), created some engaging, cartoon-like illustrations for the walls of the old "Picnic Room," which was eliminated during the major building renovation of the 1970s. She also executed in the exhibit area a larger-than-life representation of a Chinese mythological figure.

The Museum commissioned two non-staff artists, Charles R. Knight (1874-1953) and Julius Moessel (1871-1959), to do mural groups—Knight in paleontology, Moessel in botany. The 28 Knight murals, on view in the Hall of Dinosaurs, were done between 1927 and 1931. Fourteen of these measure 9 by 25 feet, the remainder 9 by 11 feet—covering, in total, the astounding area of 4,536 square feet of canvas, surely one of the



Above: Mural of mastodons (in Hall of Dinosaurs) completed by Charles R. Knight in 1928. 71154 *Knight is shown at right (about 1906-08) by elephant head he sculpted for the Elephant House in the Bronx Zoo. Courtesy Dept. Library Services, American Museum of Natural History.*
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most ambitious painting projects ever undertaken. Possibly the best known representations ever done of prehistoric life, Knight's murals—particularly those of dinosaurs—have been reproduced over the years in a great number of books and periodicals.

In 1940, Julius Moessel completed a series of fourteen murals depicting the story of the world's food plants. These 8-by-10 canvases may be seen in the Hall of Useful Plants. Nine of the murals depict the production and preparation of agricultural foodstuffs; the other five depict scenes concerned with the transportation, distribution, and trade of vegetable foodstuffs.

Born in Germany, Moessel came to the United States shortly after World War I, following study at the Royal Academy of Munich. "Birds, four-footed animals, and exotic plants appear to be his special interest," noted the September 1940 *Field Museum News*. "Some of his often grim humor finds expression in his portraits of the orangutans and monkeys. These commonly dec-

orate the cover of the *Saturday Evening Post.*" Moessel was a resident of Chicago and, like Knight, enjoyed considerable commercial success in the world of art—at least for some years. He died destitute, at the age of 88.

Even if Field Museum had the space and the plans to add to its habitat groups and its muralized presentations of natural history, it is most likely that the backgrounds and murals would be achieved, no longer with paint and brush, but by means of photography and printing—processes which have experienced great technological advances in recent times. With this in mind, the remarkable achievements of Charles Abel Corwin and those artists who followed him should be viewed in a new historical perspective.

Right: Julius Moessel (1939) shown with one of his murals on view in the Hall of Useful Plants. Another of the murals is shown below. [illegible]

Tours for Members

For reservations, call or write Dorothy Roder (322-8862), Tours Manager, Field Museum, Roosevelt Rd. at Lake Shore Dr., Chicago, Il 60605

The Great Silk Route of China

May 21—June 15
$4,550

The silk route linked China, Central Asia, Persia, the Middle East, and Europe nearly 2,000 years ago, giving birth to the exotic and spectacular oasis cities of Xinjiang Province. Merchants carried more than silks, silver, and spices along this route, however; they also carried ideas, traditions, and Buddhism. Field Museum will trace the Chinese portion of this great caravan highway, bringing to you not only a sense of Chinese history, but the movements of history itself. We fly from Chicago to Tokyo and from there to Beijing, where touring will include the Forbidden City, the Temple of Heaven, the Summer Palace, the National Museum, and to the north, the tombs of the Ming Emperiors and the Great Wall.

In Urumqui we get our first taste of the silk route as this exotic, green-blanketed oasis thrives amidst bleak desert, highlands, and the snow-capped peaks of the Tianshan Mountains. It is the capital of the Xinjiang Uygur Autonomous Region, populated mostly by the Uygur Muslims and showing their influence in all aspects of its life. Huge mosques dominate the city; the people strictly observe their religious festivals and dress in distinctive costumes, the older women wearing veils, as they keep their traditions. Turpan is likewise an oasis in the desert, a small but richly exotic caravan city still bustling with colorful bazaars. From here you can visit the ruins of two ancient silk route cities, destroyed by Genghis Khan, but yet beautiful in the golden sand.

Dunhuang, our next stop, proves the importance of the silk route in dispersing new ideas and new religions. Here we find one of the world's priceless troves of Buddhist art. The Magao Caves, the oldest Buddhist shrines in China, were begun in A.D. 366 by a monk who saw a vision of a thousand golden Buddhas. Hundreds of caves have been carved out of the sandstone cliffs in a layered honeycomb pattern, connected with wooden walkways and ladders. Carved over a period of a thousand years, these grottoes bear witness to the changing artistic style and daily lives of the Chinese people. Some of the statues show an Indian influence. The walls of these caves are carved with niches containing brilliantly painted statues, and the ceilings are painted with murals depicting the life of Buddha, Chinese mythology, religious stories, and the daily activities of the local people.

Lanzhou is another important caravan city and garrison town since ancient times. If the water level is high enough, we will take a river trip to Binglingsi, a Buddhist monastery with rarely seen monumental carvings. Xian is our next stop. Once the largest city in the world, dressed in imperial splendor, it served as capital of eleven dynasties. It was a major trade route link in the 7th and 8th centuries, but is now primarily known for the discovery there of the vast life-size terra cotta army buried with an ancient emperor.

Shanghai is currently China's largest, most populous and urbanized city. It has a western flavor even today. The contrast of the "Old Town" which is typically Chinese, and the 1930s high-rise district is startling. Guilin is perhaps the most beautiful city in China, situated on a lush green plain laced with rivers and lakes. A cruise on the Li River shows off this region's spectacular scenery and its "stone forest" of amazing rock formations. Our next visit is to Guangzhou (Canton), an interesting city that is increasingly integrating with Hong Kong. It is the most important trade and industrial center in southern China and has a subtropical flavor with its verdant parks, world-famous cuisine and boisterous atmosphere. On to Hong Kong for a day before returning to Chicago via Tokyo.

The Classical Mediterranean

May 24—June 8
$4,595 — $6,495

Our tour begins in Rome where the "Eternal City" offers us the Forum, the Colosseum and the Pantheon. From there we visit Pompeii and the beautiful hillside town of Positano where we embark the Sea Cloud after an excursion to Paestum and Ravello. Tunisia is our next stop where we will explore ancient Carthage and the old market of Tunis. In Malta we can follow in the steps of the Knights Hospitalier as we visit their medieval palaces. Sicily offers us the ancient port of Naxos and the unique beauty of Taormina. Positioned high on a terrace overlooking the blue sea, it boasts beautiful gardens and the Greek Theatre which affords a stunning view of Mount Etna. Mountainous Cephalonia lures us to the ruins of an ancient castle while Old Corinth impresses us with its Temple of Apollo. We end our tour in Athens where we will visit the Acropolis, the Parthenon and the Temple of Athena Nike.

What better way to sail the blue Mediterranean than aboard the legendary *Sea Cloud?* The largest private sailing ship ever built, she retains the elegance of the past while offering contemporary comfort. This is already a sell-out tour at the California Academy of Sciences and their leader, Dr. Robert T. Orr will make a fine addition to our outstanding classical archaeologist, Dr. Richard De Puma. Their intimate knowledge of the sites we will be visiting, their expert leadership qualities, and the charm of the *Sea Cloud* make this a tour second to none.

North Cape and Spitzbergen

June 27-July 12
$3,550-$6,440

Sail to the Land of the Midnight Sun, to the North Cape, where the sun shines 24 hours a day, aboard the "ultra deluxe" *Vistafjord*. This Five-Star ship represents the very epitome of ocean-going elegance: impeccable service, first-class cuisine, dazzling entertainment, luxurious living, and unrivaled attention to detail.

June 28. Embarkation from Hamburg, Germany. Here on the River Elbe is one of Europe's brightest and most exciting cities. Explore the entertainments of the St. Paul district, go sightseeing to City Hall and shopping along the busy Mockebergstrasse, or drive out to the peace and quiet of the picturesque Alster Lakes.

June 30. Molde, Norway. An unusually warm climate graces this delightful Norwegian town, which lies in the path of the Gulf Stream. Of special note: Romsdal Museum, an open-air compound of carefully assembled wooden houses dating back to the time of the Vikings. Aandalsnes, Norway. This small, picturesque village on the banks of the Rauma River lies below the soaring mountains and tumbling waterfalls of the Romsdal Valley. Ascend Stifjell mountain and cross the lofty bridge over Stigfoss Waterfalls. There are superb views down the Isterdal Valley, a fertile land filled with quiet peaceful farms.

July 3. Magdalena Bay, Spitzbergen. Massive glaciers in Spitzbergen's mountains inch their way down to the sea and Magdalena Bay, providing one of the world's most awesome natural spectacles. Cruising Lillehhok Fjord. Sailing past New Aalesund.

July 4. Longyearbyen, Spitzbergen. This is Spitzbergen's main settlement, located at the head of Advent Bay. It looks out on a coastline of seals, walrus, whales, and thousands of seabirds. Longyearbyen was named by an American engineer who founded it in 1906; the search for coal is still pursued in nearby Barentsburg.

Tours for Members

July 5. Skarsvaag, Norway. Here is the most northerly point in Europe. Up the road and across the tundra from Skarsvaag, you will have a rare and awe-inspiring opportunity—a chance to stand on 1,000 ft. cliffs with nothing but polar ice-pack between you and the Arctic Ocean. In the summer, as you shall see, the sun shines all the time—24 hours a day.

July 6. Hammerfest, Norway. The brightly painted houses of the world's most northerly town contrast greatly with the harsh hills which are its backdrop. The attractive little shops offer a wide array of fine crafts, and the Hammerfest Museum records more than 200 years of the town's rich history.

Tromso, Norway. Sheltered by the islands along this craggy coastline, Tromso has long been an important fishing port and the largest city along the Arctic Circle. It was from Tromso that the famous explorer Admundsen staged his great expedition to the North Pole.

July 7. Narvik, Norway. This shipping port along the ice-blue fjords is surrounded by snow-tipped peaks that rival any in the country. Visit the crystal clear Rombaksfjord, which can be crossed via a magnificent new suspension bridge, then continue on to Bjerkvik and Gratangen, where you'll be surrounded by some of northern Europe's most beautiful wildflowers.

July 8. Sailing past the Arctic Circle and several seaside towns.

July 9. Hellesylt, Norway. An excellent starting point for excursions through a land where mountains soar to dizzying heights and waterfalls spread their lacework across the cliffs. Visit the orchards strung together in a brilliant garland of blossoms.

Geiranger, Norway. Geiranderfjord is one of the most splendid in all of Norway, enclosed on both sides by precipitous walls of rock. Visit Geiranger's tiny octagonal church, ascend Mt. Diasnibba and take in a magnificent panoramic view of the mountains, lakes and waterfalls. And save time to visit Tystig branch of Europe's most enormous glacier.

July 10. Bergen, Norway. This town of seven hills was founded in 1070 and is now one of Norway's major seaports. Windows on its past include the 13th-century fortress of Bergenhus, the Rosenkrantz Tower and Edvard Grieg's home at Troldhaugen, while present day Norway is typified by the busy fish and flower market.

July 12. We disembark in Hamburg, Germany.

Bertram G. Woodland, curator of petrology at Field Museum, will accompany the tour. He received his B.Sc. (honors) at the University of Wales and his Ph.D. at the University of Chicago. He will enrich this lovely cruise with his thorough knowledge of the rock formations and geologic history of the fjords, and discussions on the many interesting excursions. Working as a lecturer/tour leader is not a new experience for Bert, as he has escorted Field Museum groups through England and Wales (his native country), Galena, Illinois and several Grand Canyon rafting expeditions.

English Homes and Country Tour

July 1—15

$2,725 (double occupancy)

The "treasure houses" of Britain are best experienced within their architectural context and amidst their natural landscapes. Here we travel the paths of history and culture in the most immediate sense. But unlike most tours that rush you around for a cursory introduction, Field Museum is offering the discriminating traveler an opportunity to get to the heart of the English people and live in the English countryside as they do. The English are a thoroughly hospitable people, making you feel truly welcome as they take you into their comfortable homes as a guest of special importance. Past travelers have made lasting friendships with their hosts, returning again and again, even reciprocating the welcome as their English friends visited here. This view of a remarkable country is rare indeed, and especially relaxing since you stay several days in one home instead of spending your time on a bus. We stay in the southeastern counties where charming thatched villages complement vast cathedrals and living hedgerows set off lush royal gardens. Your hosts and hostesses include baronets, generals, company directors, doctors, members of Parliament, and landowners. Their homes range from mansions to more modest yet extremely comfortable cottages. Accommodations include use of a private bathroom.

Come and visit this 'tied to the past' yet forward-looking and charming country. Inquire into the customs and foibles of the people as you tour with not only a local guide, but with a scholar from Field Museum, who was born and raised in this remarkable country. Dr. Peter Crane got his Ph.D. in botany at the University of Reading. He is an associate curator in the Department of Geology at Field Museum and was recognized as one of ten "Outstanding Young Citizens" by the Chicago Junior Association of Commerce and Industry in 1985. He is excited about this unusual travel opportunity in his native country and invites you to join him and his countrymen in an exploration of English Homes and Country.

Alaska

$4,885

July 2-16

Experience the Great Land. Descriptions of Alaska are filled with superlatives—a state more than twice the size of Texas with a population less than that of Denver, 33,000 miles of coastline, 119 million acres of forest, 14 of the highest peaks in the United States culminating in Mt. Denali (formerly Mt. McKinley), at 20,320 feet. Alaska is equally a land of wildlife superlatives, from her great herds of caribou to swarming seabird rookeries to surging salmon in migration. When one thinks of Alaska one thinks of wilderness, of nature still fresh and undomesticated, of experiences dreamed of but mostly unavailable to us of the lower 48.

Join us for an Alaskan odyssey through a wide range of habitats from the rockbound fur seal and sea bird colonies of the Pribilofs, to the dripping forest and calving glaciers of the southeast, to the grandeur of the Alaskan Range, to the Fjordlike quiet and beauty of the inland passage.

Our travels will be by plane, train, bus, boat, and foot—whatever best enhances our experience. Emphasis will be on the land, its history, its wildlife. Interpretation combined with direct observation will provide an enjoyment and quality of experience unavailable to the casual visitor. Whatever your interest in natural history—marine mammals, birding, mountains, photography, flowers, forests, glaciers, rivers—this tour will show you Alaska in all its diversity and splendor.

Dr. David Willard, manager of Field Museum's bird and mammal collections, will be tour leader. He received his Ph.D. in Biology at Princeton University, where he was acting curator of Princeton Museum of Ornithology. He has been on a number of research expeditions for Field Museum. His experience in bird and animal identification and his experience as a tour leader will enrich this expedition for you. He invites you to share in the beauty of Alaska this summer.

For further information or to be placed on our mailing list, call or write Dorothy Roder, Tours Manager, Field Museum, Roosevelt Rd. at Lake Shore Dr., Chicago, IL 60605. Phone: 322-8862.

Field Museum of Natural History
Membership Department
Roosevelt Road at Lake Shore Drive
Chicago, IL 60605-2499

EDITH FLEMING
946 PLEASANT
OAK PARK IL 60302

FIELD MUSEUM OF NATURAL HISTORY BULLETIN

May 1986

* *Subramaniam Performs Classical Violin of India, Saturday, May 3*
* *Dance, Song, and Martial Arts from India, Sunday, May 11*
* *Members' Night, Friday, May 16*
* *Hema Rajagopalan Performs Classical Indian Dance Saturday, May 17*

See pages 3, 4

Field Museum of Natural History Bulletin

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May 1986
Volume 57, Number 5

COVER

Hema Rajagopalan, one of India's most graceful dancers, performs at Field Museum on Saturday, May 17, at 3:00pm. For further information please see page 4.

Ninth Annual Spring Systematics Symposium
Saturday, May 10, 8:50am to 4:30pm

This year's symposium topic is "Evolution of Human Hunting" and features ten invited speakers. The pre-registration fee (until April 10) is $10. Registration after that date is $15. Registration forms may be obtained by writing Dr. H. M. Nitecki at Field Museum; they may also be obtained at the Museum on the morning of May 10 before the talks begin.

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Subscriptions: $6.00 annually, $3.00 for schools. Museum membership includes *Bulletin* subscription. Opinions expressed by authors are their own and do not necessarily reflect the policy of Field Museum. Unsolicited manuscripts are welcome. Museum phone: (312) 922-9410. Notification of address change should include address label and be sent to Membership Department. Postmaster: Please send form 3579 to Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, Chicago, IL 60605-2496.
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Events

Festival of India 1985–1986 is a joint India-United States effort to increase Americans' knowledge of India and develop goodwill and understanding between the peoples of the two countries.

Pung cholam (acrobatic drumming) with nupi pala (women's songs)—performance by the Meitei of Manipur. Photo courtesy Aditya Patankar.

Meitei

Dance, Song, and Martial Arts from Manipur

Sunday, May 11, 3:00pm
James Simpson Theatre

Celebrate the performing arts of Manipur with acrobatic drum dancing, mesmerizing devotional songs, and ritualistic ancient martial arts. Manipur, located in northeast India, is a lake and stream-filled valley surrounded by mountains. The Meitei are the valley peoples, once separated into many clans. Thirteen Meitei performers bring a rare glimpse of performances seldom seen outside the confines of Manipur. The Nupi Pala (women's devotional songs) begin the performance with mesmerizing rhythms, falsetto voices, and serpentine body movements. Pung Cholam (acrobatic drumming) drummers continue with slow, graceful movements and, as the beat of the drums increases, leap and twirl through the air. The ancient martial arts, Thangta, combine animal-like movements used in ritual with the swords, spears, shields, and knives used in warfare up to the end of the 19th century.

This performance is offered in cooperation with the American Institute of India Studies Committee on the Performing Arts.

Tickets: $5.00 (Members: $3.00)
Fees are nonrefundable. Please use coupon to order tickets. Seating is general admission. Theatre doors open one hour prior to performance.

Classical Violin of India

L. Subramaniam, violinist

Saturday, May 3, 3:00pm
James Simpson Theatre

Field Museum's celebration opens with a performance by one of India's premiere classical violinists and leading authority on South Indian music, Dr. L. Subramaniam. South Indian classical music is a complex musical style that combines unique melodic forms (ragas) and rhythmic cycles (talas). Like Western jazz, it owes its distinctive essence to improvisation. Dr. Subramaniam celebrates Festival of India at Field Museum with a unique violin performance featuring the classical Indian forms of "Varnam," "Kriti," and "Ragam, Taman and Pallavi."

Tickets: $7.00 (Members: $5.00)
Fees are nonrefundable. Please use coupon (p. 4) to order tickets. Seating is general admission. Theatre doors open one hour prior to the performance.

CONTINUED →

Events

Bharata Natyam
Classical Dance of India

Hema Rajagopalan

Saturday, May 17, 3:00pm
James Simpson Theatre

Bharata Natyam is the most ancient and highly disciplined of the classical dance forms of India. It speaks a universal language—the language of gesture. The feet beat out complicated counter-rhythms, the lower limbs are bent in the characteristic low squat, with the arms, neck, and shoulders part of the movement. In the pantomime sections, the hands tell the story through conversational gesture-language, while the face expresses the mood. Hema Rajagopalan has been described as one of the most graceful dancers of India. She has been an ardent student of Bharata Natyam since the age of six. The marvelous fluidity of her movements, the subtlety of her facial expression, and her impeccable rhythm make her performance an enchanting experience.

This performance is supported in part by the Illinois Arts Council.

Tickets: $5.00 (Members: $3.00)
Fees are nonrefundable. Please use coupon to order tickets. Seating is general admission. Theatre doors open one hour prior to performance. Public Programs Information: (312) 322-8854

Registration

Be sure to complete all requested information on the ticket application. If your request is received less than one week before a program, tickets will be held in your name at the West Entrance box office. Please make checks payable to Field Museum. Tickets will be mailed upon receipt of check. Refunds will be made only if the program is sold out.

☐ Member ☐ Nonmember

American Express/Visa/MasterCard

Card Number

Signature Expiration Date

Name

Address

City State Zip

Telephone: Daytime Evening

Return complete ticket application with a self-addressed stamped envelope to:

Field Museum of Natural History
Public Programs: Department of Education
Roosevelt Road at Lake Shore Drive
Chicago, IL 60605-2497

Program	Number of Member Tickets	Number of Nonmember Tickets	Total Tickets	Amount Enclosed
Classical Violin				
Meitei				
Classical Dance				
			Total:	

Have you enclosed your self-addressed stamped envelope?

Events

Te Maori: Family Program

Out of the Night of Darkness: The Maui Legends

Saturday, May 10, 2:00pm

Some say Maui was born at the edge of the sea, some say he was born fully grown. Some say he can change into many different shapes. Join us at the Maori meeting house for a dramatization of some of the many Maori legends about the clever and amazing Maui.
This program is free with Museum admission and tickets are not required.

Te Maori Film Program

"Children of the Mist" 30 min.

A brief history of the Tuhoe Tribe of New Zealand is followed by a depiction of the life and problems of this contemporary, rural Maori tribe that has migrated to an urban area.

"Tahere Tiki Tiki, The Making of a Maori Canoe" 30 min.

Explore the superb craftsmanship that goes into the design and production of these seaworthy vessels.

Saturday and Sunday, May 24 and 25, 1:30pm

Film program is free with museum admission. Tickets are not required.

Family Feature

Shisha Embroidery—Mirror Needlework from India

Sunday, May 11 and Saturday, May 17
12:30-2:30pm

Jewels, silvery beetle wings, and chips of mica made the clothes of ancient India sparkle. Now, mirrors are used to beautify the embroidery of India. Examine different examples of the symbolic designs used in shisha embroidery. Make your own design using elements from these traditional patterns and make the fabric alive with light.
Monthly Family Features are free with museum admission and tickets are not required.

Festival of Masks

Saturday and Sunday, May 31 and June 1

A two-day celebration of masks, mask-making and masked performances of peoples from around the world. Demonstrations of mask-making from different cultures are featured, along with explanations of their masking traditions. Take the time to explore the Museum and discover the many masks on exhibit from around the world. Workshops offered throughout the weekend give families the opportunity to make their very own masks based on the numerous examples they have seen. Musical and dance performances featuring masks from various cultures are offered both days, and a display of masks made by Chicago-area school children is also featured during the celebration.
All activities are free with Museum admission.

May Weekend Programs

Each Saturday and Sunday you are invited to explore the world of natural history at Field Museum. Free tours, demonstrations, and films related to ongoing exhibits at the Museum are designed for families and adults. Listed below are only a few of the numerous activities each weekend. Check the *Weekend Passport* upon arrival for the complete schedule and program locations. These programs are partially supported by a grant from the Illinois Arts Council.

May

4 11:30am. *Brontosaurus Story* (tour). A fascinating look at some of the newest discoveries about the "thunder lizard" and other larger dinosaurs.

1:00pm. *Spring Wildflowers* (slide lecture). Recognize the wildflowers found in Chicago's woods, meadows, and prairies.

10 12:30pm. *Museum Safari* (tour). Seek out big game from Africa and mummies from ancient Egypt as you travel through Field Museum exhibits.

These programs are free with Museum admission and no tickets are required.

18 2:00pm. *Malvina Hoffman: Portraits in Bronze* (slide lecture). Examine the life and works of Malvina Hoffman, concentrating on the Portraits of Mankind collection commissioned by Field Museum.

24 12:30pm. *Museum Safari* (tour). Seek out big game from Africa and mummies from ancient Egypt as you travel through Field Museum exhibits.

1:30pm. *Himalayan Journey* (slide lecture). See Lhasa and other towns now open to tourists, and Bhutan, "Land of the Thunder Dragon."

Museums as Agents for Public Education

THE KELLOGG PROGRAM

by Helen H. Voris

Mention the word "Kellogg" and millions of people think of breakfast. But for approximately 400 museum educators, curators, and exhibit designers from across the country it brings to mind an imaginative program of professional development workshops conducted by Field Museum's Education Department over the past four years:

"Museum Education: Strategies for Effective Programming," a one-week workshop offered twice a year, assembles 20 museum educators to learn more about theoretical and practical aspects of their role in getting people involved with exhibits.

"Exhibition Development: A Team Approach," a three-day workshop offered twice a year, provides an opportunity for ten museum teams of educators, curators, and exhibit designers to explore their respective areas of expertise and potential contributions to the exhibit development process.

The generous award from the W. K. Kellogg Foundation of Battle Creek, Michigan, which has made these workshops possible, is based on the premise that talented, enthusiastic, and well-trained staff are the key to producing more effective exhibits and educational programs, as well as greater public awareness and use of museum resources.

The workshops have earned a national reputation for excellence, establishing Field Museum as a leader in the development of training experiences for museum professionals. A strong and growing interest in the program has made it highly competitive: nearly 1,000 people have applied thus far. Successful applicants receive stipends to cover their transportation and expenses. They must be full-time employees of museums, and they are selected on the basis of their level of responsibility, their ability to articulate their own needs and those of their institution as related to the content and goals of the workshops, and the degree of support from their administrative supervisors.

The workshops have drawn participants from more than 225 museums located throughout the U.S. and Canada. Staff of the Alaska State Museum, the University of Alaska Museum, and the Bernice Pauahi Bishop Museum in Hawaii have particularly welcomed the Kellogg Foundation's support, since the cost of travel from their distant locations often precludes their attendance at professional workshops and conferences. Participants have come from museums of every size as well, with the Elmhurst (Illinois) Historical Museum, which serves 4,100 visitors each year with a staff of four, at one end of the spectrum, and the National Gallery of Art, with over 900 staff members and an annual attendance of over six million visitors, at the other.

Presentations at the workshops by Field Museum staff, keynote speakers, and small group activities generate lively discussions which often continue through the evening and start again at breakfast the next day. Specific issues are considered within the framework of several overarching themes: *mission*, *goals*, *objectives*, and *evaluation*. How is the mission of one's museum reflected in its organizational values, structure, and functioning? How can a museum mission statement be used to help articulate goals and objectives for exhibits and programs? How can evaluation of exhibits and programs be used as a positive force to chart and guide progress in the direction of the mission? Attention to the museum audience is implicit in these themes: It is not enough to know who we are as museums, and where we are headed; to get there we must know, in more depth than ever before, the audience we serve—and those we

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Helen Voris is a writer for special projects in the Education Department.

would like to serve. We must understand not only our visitors' expectations, needs and concerns, but also how they learn, what they enjoy, why they visit museums, and—why they do not.

Workshop participants confront these and other issues by taking part in various activities and then drawing on these experiences as a basis for discussion, thereby integrating theoretical concerns with practical considerations, and giving depth and breadth to their understanding of the issues and to their abilities to grapple with them.

On occasion, visitors to Field Museum may have encountered workshop participants carrying out some of these activities in museum halls. In one activity, for example, participants spend 15 minutes observing a single object in an exhibit and recording their reactions. They are then asked to categorize their comments and relate them to possible visitor responses to exhibits. Usually there are some observations, some emotional responses, some questions about the subject matter; often there are judgments about aesthetics, and comments on personal likes or dislikes. This experience initiates a discussion of many related questions: In what ways are museum professionals and general visitors alike and different in their reactions to objects on exhibit? What do we know about our visitors' experiences with such objects? What assumptions are we making about our visitors' experiences? How can we test these assumptions? By what means can we provide visitors with exhibit-related experiences that are both enjoyable and educational?

Workshop participants also have fun as they learn. On a day when a workshop is in session, one might catch sight of someone carrying a flock of inflated balloons, another covered with glitter or festooned with artificial birds, or yet another playing a set of "mupejas" (multiple peanut butter jars, of course)—all good-humoredly taking part in a lively role-playing activity designed to explore the process of creative collaboration with the wide assortment of resource persons utilized by museums.

One session of each workshop is devoted to several uninterrupted hours of work on a problem each participant has struggled with at his or her home institution. Using a systematic problem-solving guide, and with time for reflection away from ringing telephones and overflowing schedules, educators, curators, and designers alike have found this to be an extremely productive and even invaluable experience.

Articulation of a problem to be solved is one part of a pre-workshop assignment which requires rigorous analysis of oneself and one's institution. Just as the workshop thus begins for participants before they arrive in Chicago, so it also continues after they leave. They take home a resource notebook of ideas compiled from the pre-workshop assignment — descriptions of the most

Svein Edland, curator of exhibits for the Loveland Museum and Gallery, and Signe Hanson, designer for the Boston Children's Museum, participate in one of the lively discussions that characterize the workshops.

innovative program attempted in the past year by each participant, and his or her greatest administrative challenge, together with successful and unsuccessful solutions. As alumni of the Kellogg workshops, they become part of a growing network of museum professionals who continue to communicate with each other — sharing ideas, solutions to problems, struggles, frustrations, inspirations, and triumphs.

Thus far, 31 percent of the museums represented at the workshops focus on history and culture, making this the single largest group. Among those attending have been staff from institutions commemorating former presidents — the Gerald Ford Museum in Grand Rapids, Michigan, the Herbert Hoover Presidential Library and Museum in West Branch, Iowa, and the Woodrow Wilson House in Washington, D.C. — as well as famous places, such as the Mystic Seaport Museum in Mystic, Connecticut, Sleepy Hollow Restorations in Tarrytown, New York, and the Charlestown Navy Yard of the Boston National Historic Park.

About 25 percent of the institutions represented focus on some area of art. Not only have several well known institutions such as the National Gallery of Art, in Washington, D.C.; the Metropolitan Museum of Art, in New York; and the National Gallery of Canada

sent staff to our Kellogg workshops, but an even greater number of smaller institutions have done so, such as the Paine Art Center and Arboretum in Oshkosh, Wisconsin; Paris Gibson Square in Great Falls, Montana; and the Plains Art Museum in Moorhead, Minnesota. Visits to various remote areas of the country would no doubt turn up people who are acquainted with Field Museum, since many small, widely distributed museums have sent staff to our Kellogg workshops.

Natural history museums account for about 21 percent of the total number of institutions attending the workshops. Other major natural history museums in the U.S. which rank with Field Museum in size and scope—the Academy of Natural Sciences in Philadelphia, the American Museum of Natural History in New York, the California Academy of Science in San Francisco, the Natural History Museum of Los Angeles County, and the Smithsonian Institution's National Museum of Natural History, in Washington, D.C.—have all sent staff members to Field Museum's Kellogg workshops. But these workshops provide professional development opportunities for a much greater number of personnel from medium-sized and small natural history museums, many of which would be otherwise unable to provide such opportunities for their staff. And the same holds true for those museums whose purview is not natural history. One participant's comment was typical: "Because our budget is so restricted, I have not been able to travel to any meetings or seminars before, and didn't know what an enriching experience it would be. It has given me greatly increased confidence in myself, both from a personal and professional standpoint."

The remaining 25 percent of the participating institutions comprise children's museums, science and technology museums, and museums with live collections—aquaria, zoos, arboreta, and botanical gardens. The diversity of institutions and their staffs has been an important element in the design and conduct of the workshops. Workshop participants have found they have benefited greatly from the resulting variety of perspectives on common problems. Said one: "A key element to gaining insight was the diversity of types of museums that were represented at the Field Museum workshop. It gave me contact with people who were doing totally different kinds of programs, both in content and audience. In turn I found it much easier to stretch my imagination about types of programming we could be providing that fits easily into the scope of our institution." "This multi-disciplinary approach opened my eyes," commented another.

Participants evaluate the workshop upon its conclusion, and also report on its effects three months later and nine months later. Their responses have been very enthusiastic. One participant reported, "[My] museum has improved in the area of public programs as a result of the workshop. Prior to the workshop, many programs were planned at the last minute. Now, more time is spent in planning and preparation. Also, each program is evaluated by the staff members for planning future events. As a result, the programs have been better planned, run more smoothly, and have had a more professional look to them. There has also been an increased attendance since we have time to publicize the programs now!" A member of one of the exhibition development workshops commented, "The workshop made me think about my role on the team and how my performance affects fellow team members. Although we have long felt we worked as a team, we never stopped to discuss the process. It's not often that one gets the luxury of taking time to reflect. For me, the opportunity enlightened me about the division of labor, others' constraints, and the amount of time needed to work as a team successfully. I think that it has made us more helpful, sensitive, considerate, and less demanding. This has led to better exhibit planning and a smoother development both in construction and interpretation. Thank you again for the opportunity."

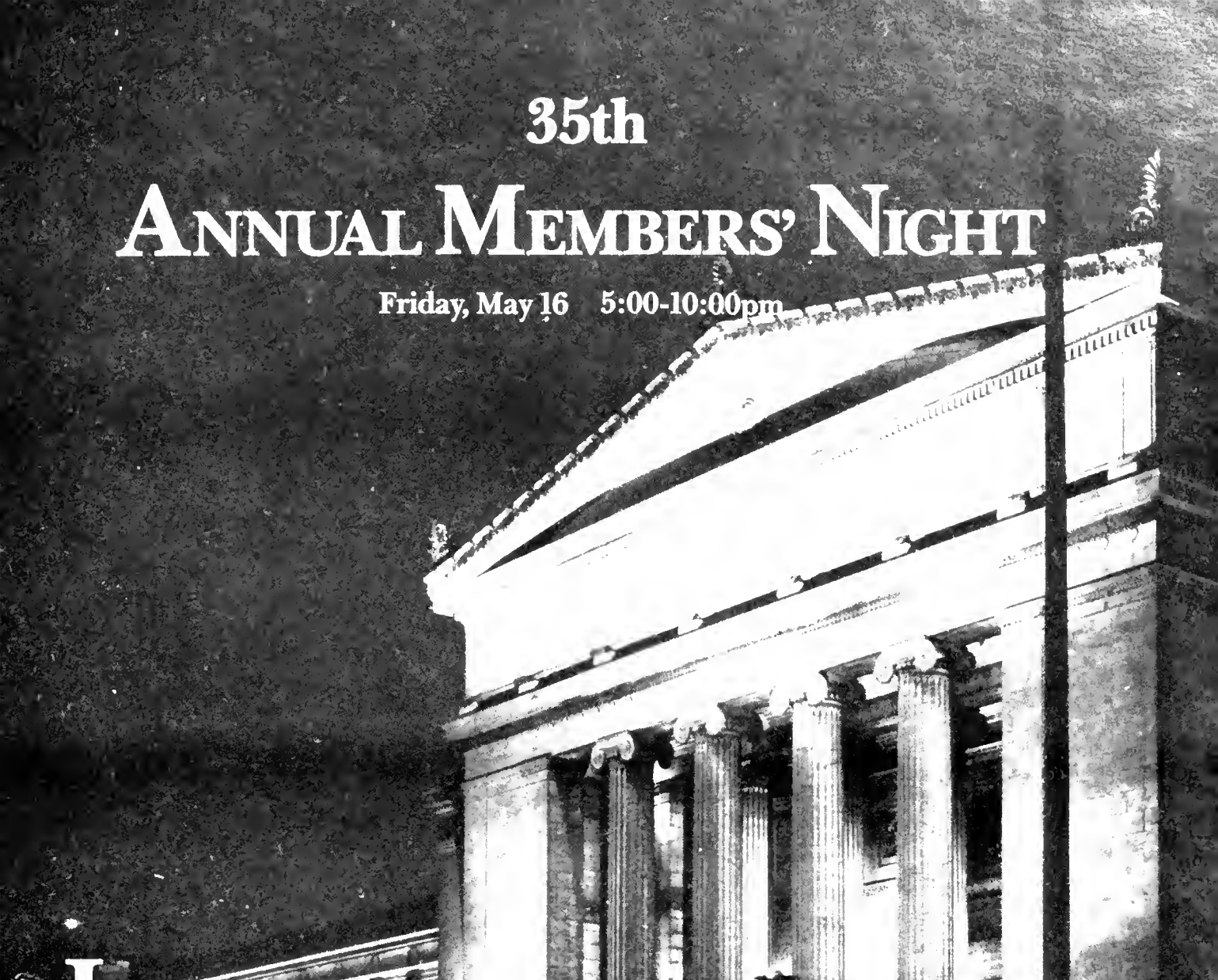
As the results of the follow-up evaluations continue to accumulate, the considerable effort that the Field Museum staff have put into developing and conducting the workshops is well rewarded by the impact of the programs. "Utilizing more long-range planning and forcing ourselves to focus on more appropriate and specialized goals is streamlining our procedures in the education department and the museum as a whole," one participant said. Another was delighted to report that "a fund-raising event modeled after one put on by a fellow Kellogg participant's institution raised more money than any single fund-raising event ever put on by our museum. It will be an annual event!" Yet another predicted: "I anticipate that not only will the content [of our exhibits] continue to improve, but the types of exhibits that we will be presenting to the public will have greater scope. Just to be able to sit down on a regular basis and discuss how each of us sees an exhibition developing opens many doors to improving the quality of the message and our understanding of each other's role and the importance of each position in providing a quality exhibition program for the public."

And that, after all, is what the Kellogg workshop program at Field Museum is all about: enhancing the quality of exhibits and programs, and finding new ways to serve museum visitors better.

Museum professionals who would like more information should contact Teresa LaMaster, program coordinator, at (312) 922-9410, extension 361; or Carolyn Blackmon, chairman of the Education Department and Kellogg project director, extension 247. FM

35th
ANNUAL MEMBERS' NIGHT

Friday, May 16 5:00-10:00pm



In 195[illegible] welcome[illegible] Memb[illegible] Doors." [illegible] tion, we w[illegible] this year and invite you, your family and friends to explore "behind-the-scenes" at Field Museum's 35th Annual Members' Night. This is our opportunity to thank our Members for their support and your opportunity to join us for a very special evening.

Our curators, scientists, and entire Museum staff will be on hand to share their knowledge through exhibits, demonstrations, and activities and of course there will be entertainment throughout the evening in Stanley Field Hall.

If you are coming by car you may park free of charge in the Museum's north lot and Soldier Field lot. Simply show your Member card or invitation. Free shuttle bus service will be operating between the Loop and our south door. These CTA buses, marked *"Field Museum"* will originate at the Canal Street entrance of Union Station (Canal at Jackson) and stop at the Canal Street entrance of Northwestern Station (Canal at Washington); Washington and State; Washington and Michigan; Adams and Michigan; Balbo and Michigan.

Buses will begin running at 4:45pm and continue at approximately 20-minute intervals until the Museum closes at 10:00pm. You may board the free *"Field Museum"* CTA bus by showing your Member card or invitation.

Members are invited to bring family and up to four guests at no additional charge. Special arrangements for handicapped persons can be made by calling 922-9410, extension 458, beginning April 28.

"Behind-the-Scenes" activities will end at 9:00pm.

LAKE RENWICK

UNLIKELY HAVEN FOR THE ENDANGERED

by Jerry Sullivan

ONE OF THE FINEST NATURAL AREAS in northeastern Illinois is a played out, water-filled gravel pit. Carved by a scouring dragline through 50 years of digging in the glacial outwash just east of the town of Plainfield, it once supplied raw materials for concrete and ballast for everything from county roads to the building of the Joliet, Plainfield, and Aurora Railroad.

At various times in its history, Lake Renwick, to give the pit its proper name, has also been a beach resort and the site of a dance hall. It remains a sort of surreptitious fishing hole, a place for local kids to sneak into, as their fathers did before them, in hopes of hooking a carp or a large-mouth bass before the gravel company guard sees them.

U.S. Route 30 skirts the southern shore; the Elgin, Joliet & Eastern tracks mark the northern boundary. Until three years ago, the noisy rattle of the gravel washer was a routine sound of summer.

But on three tiny islands in the middle of this accidental lake, one of Illinois' largest and most diverse heron rookeries provides a nesting ground for at least four species of these long-legged birds, two of them rare enough to earn the dubious distinction of a place on Illinois' Endangered Species list.

The biggest of them is the great blue heron, the largest member of its family in North America, a steel-gray giant with a wing span of six feet. Last year, the three tiny islands supported 73 tree-top nests of great blues.

Just below them, hidden in the upper branches of the box elders, are 66 nests of the sleek white great egret, one of the endangered species. Below them, down amidst the scrub, are more than 300 nests of the black-crowned night heron, the other endangered species represented here.

And on the ground, an interesting alien, the cattle egret, a moderate-size white bird, a native of the African plains that managed to get to the American Midwest through its own unaided efforts. Cattle egrets were first sighted in Illinois in 1952. They began nesting at Lake Renwick in 1970 or 1971, and last year they occupied 17 nests on these crowded little islands.

The presence of these birds in this unlikely place is both mysterious and easily explained, a product of a combination of accident and inexorable forces, a blend of the patterns and regularities of natural history and the weird contingencies of human history.

The story of Lake Renwick, like nearly everything else in this part of the world, starts with the glaciers. About 15,000 years ago, the towering ice front of the Wisconsin glacier stood just a few miles to the east of this spot. The ice was melting, wasting away, and huge torrents of meltwater, milky with ground rock, were pouring west toward the Illinois River valley. The speed and volume of the moving water determines the traces left behind. Gravel drops out at high speeds; sand can be carried by slower water. East of the DuPage River, the deposits, formally part of the Mackinaw Member of the Henry Formation, are well sorted layers of sand and gravel, a clear record of fast and slow water, laid down to await the invention of concrete and railways.

In the somewhat shorter run, the story starts with minor excavations for road gravel begun by the Township of Plainfield in the late years of the 19th century. From then to now, the general outlines of the history are quite clear, although many of the details change from source to source.

Jerry Sullivan edited *Chicago Area Birds*, published recently by Chicago Review Press; writes a column, "Field and Street," for the *Chicago Reader*; and has written extensively on birds of the Chicago area.

Double-crested cormorants (viewed in Florida). A flock of these birds (endangered in Illinois) took up residence at Lake Renwick during the spring months of 1985; a pair of immatures spent the entire summer there.

The Chicago Gravel Company, the present owners, bought the property in 1913. But the Plainfield *Enterprise* reported in 1904 that "Steam shovels in the gravel pit are doing business at the rate of about 200 carloads a day," so it seems that the site was bustling before Chicago Gravel arrived.

Sources also differ on exactly when the steam shovels dug down deep enough to expose the springs that provide the water that fills the lake. A local history prepared for the Bicentennial Year in 1976 suggests 1915 as a likely date. But the same history goes on to quote an item that appeared in the *Enterprise* in February, 1914, reporting the existence of a large-scale ice harvesting operation at the site. Ice in the winter would seem to imply water in the summer.

Indeed, the ice harvesting may have had a larger impact on the local economy than the gravel mining operations. The *Enterprise* reports "manager Sid Gray" starting up spring mining in March with a digging crew of 15. In contrast, the ice harvesting, also under Mr. Gray's direction, employed as many as 140 men, and several teams of horses as well.

As the manpower levels suggest, ice harvesting was mostly a matter of muscle. Gangs of men sawed huge blocks of ice from the lake. Teams of horses outfitted with special shoes to give them traction hauled the blocks to the shore where men with pike poles guided them onto a conveyor that hauled them uphill to a planing mill that sawed them into 24-inch cubes before more men stacked them to the ceilings of storage rooms where they would remain until summer.

You would have to say that people in those days knew how to get the good out of a gravel pit. Sand and gravel from March to November, ice in the winter, and in the balmy days of summer, swimming. The *Enterprise* of June 11, 1914, reports the opening of an elaborate facility complete with sand beach, bathhouses, bathing suits for rent, and a high diving board. A long pier was built out to a sand bar in the middle of the lake where the water was only two or three feet deep. A floating rope outlined the shallow spot for the protection of novices.

Season tickets for these delights were $3 each. The *Enterprise* pointed out that the money was for use of the bathhouse. Swimmers could use the lake for free, but the proprietors had "gone to large expense to create the convenience for safety, [and] the public will, no doubt, feel generous toward them."

Two points of historical interest can be derived from this newspaper story. First, either the owner of the bathhouse was a conman of almost mythic dimensions or there was already water in the gravel pit in 1914, and second, this may have been the first use of the term Lake

Lake Renwick's islands, where hundreds of great blue herons, cattle egrets, great egrets, and black-crowned night herons make their home.

Joe Milosevich

Detail of Lake Renwick island Joe Milosevich

Renwick. The lake was named for Mr. Frank W. Renwick, one of the three founders of Chicago Gravel, the company that bought the property in 1913.

We can also hazard a guess that the herons were not at the lake. These birds like peace and quiet, and there would have been little of either around Lake Renwick 70 years ago.

There also wouldn't have been much of anything to eat. The first certain fish in Lake Renwick were put there sometime in the mid-twenties. Chicago Gravel paid for two gondola cars full of piscines—species unknown—to be transported on the EJ&E to the Lake Renwick siding from whence they could be dumped in the lake. At the time, the lake drained into Lily Cache Creek, so a screen was erected to prevent the fish from escaping.

The fish arrived at just about the same time as the dance hall, a lakeside building with movable walls that could be pulled aside for summer ventilation. You can imagine the youth of the time arriving in flivvers for a night of what the owners described as "Your finest dance floor, championship Charleston dancing, big city dance music by Formento's Singing Syncopators."

Powell's Mill came along in the thirties, a lakeside restaurant decorated with a large, Dutch-style windmill that could be seen for miles at night when multi-colored lights played upon it. Powell's offered barbeques, chili, homemade bread, and hot coffee; but unfortunately, its presence polluted the lake so badly that the beach had to be closed.

By the mid-forties, there was nothing left at Lake Renwick but the Chicago Gravel Company. Liability problems forced the company to use guards to keep out the fishermen, and by the early fifties, the gravel digging operations had been moved north of the EJ&E tracks. All that remained near the lake itself was a gravel washing operation. Gravel dug north of the tracks came in on bottom-dumping railcars that dropped it at the foot of an inclined conveyor. The conveyor hauled it up to screens where the sand and gravel were sorted by size, with the bigger gravel pieces dropping out into a crusher.

This processing created some noise, but apparently not enough to bother the birds, who arrived—well, actually nobody knows exactly when they did arrive. As in most everything else about Lake Renwick, opinions differ.

Some long-time employees of Chicago Gravel say that herons have been around for 50 years, but we can reasonably guess that the birds they saw so long ago were wandering from river-bottom nesting colonies and set-

ting down at this new lake looking for a meal. The DuPage River is just west of the lake and a few miles farther in that direction is the Fox. The Des Plaines River is only about five miles to the east, and that river joins with the Kankakee to form the Illinois just 10 miles to the south.

To a large heron, these distances are no particular problem. They can routinely travel 15 to 20 miles searching for food, so it would not be surprising if they discovered the lake shortly after those first fish were dumped into it.

Our rivers have always been highly productive, the Illinois in particular. In pre-glacial times, the Mississippi flowed through this channel, and that history has enriched the Illinois with a much larger system of oxbows and backwater lakes than a river its present size would normally have. Although pollution, siltation, and riverside development have degraded it, we can reasonably surmise that until quite recently, heron rookeries were common along its banks.

Our first dated report comes from the Illinois Natural History Survey which recorded black-crowned night herons "present" in the Plainfield area in 1942, but that tells us nothing more than that somebody saw some flying over. Certainly no nesting colonies were discovered.

The first solid evidence of nesting is a color slide of one of the islands taken by Dr. Bruce Wallin of Plainfield, a member of the Will County Audubon Society, in the summer of 1960. The picture plainly shows black-crowned night herons and great egrets nesting in the trees. A bird-finding guide published by the Illinois Audubon Society reports the birds as nesting at Lake Renwick from 1961 on.

When the birders discovered the lake, the information began to get a little more solid. Beginning in the sixties, Lake Renwick became a regular stop for Chicago area birders. They came in early spring and late fall to look for migrating waterfowl and during the rest of the warmer months for the herons. Birders reported the arrival of the cattle egrets as nesters 15 years ago and the addition of great blues to the mix in the mid-seventies.

The birding action at Lake Renwick starts in late February when the ice begins to melt. A few great blue herons regularly winter along the Illinois River, and they are probably the birds that appear with the opening of the lake waters. The migrating ducks come early too, mostly dabbling species that feed on aquatic plants growing in the shallow water along the northwest shore.

The great egrets are next to arrive, beginning about the last week in March. The black-crowned night herons come in shortly after, and by mid-April, the cattle egrets have completed the cast.

Cattle egrets John H. Gerard, Alton, IL

March and April are very busy months around Lake Renwick, as the birds gather sticks for rehabbing nests. There is simply no space left for new nests, so touching up last year's is the only option the birds have. The birders watch from Route 30, since a fence and the company guards prevent them from getting any closer. This is birding of a sort to satisfy the most sedentary. Just pull off onto the shoulder of the highway and look. If you really hate exercise, you don't even have to get out of your car. The rookery islands are about 600 yards away, and the comings and goings of the big birds are easily visible. Binoculars will bring them closer. A spotting scope will put you right on top of them.

There is one person with a better view. Joe Milosevich is an art teacher and gallery director at Joliet Junior College and the president of the Will County Chapter of Illinois Audubon Society. He lives just a half a mile south of the lake, and for the past four years he has been the official census taker at the Lake Renwick heron rookery.

Joe is the one lucky soul who has permission from Chicago Gravel to enter company property. He can drive his car to the north shore of the lake, just 200 yards from the rookery islands. From that superb vantage point, he can count nests until the emerging leaves hide them and watch the young of the year begin to explore the world.

Joe's numbers, added to the somewhat less systematic numbers of earlier counters, show that the Lake Renwick herons are enjoying a population explosion. Great egrets were building about a dozen nests 15 years

Great egret (breeding plumage)

Black-crowned night heron

ago. They reached 20 nests in the late seventies; last year, they built 66. Black-crowned night heron numbers increased by over 100 in just one year, from 273 in 1983 to 390 nests in 1984. And the great blue herons have gone from zero in the mid-seventies to 38 in 1983, 57 in 1984, and 73 in 1985.

And there's more. With Joe checking the place carefully throughout the breeding season, we know that small flocks of double-crested cormorants—another of Illinois' endangered birds—stayed at the lake for most of April and May last year, and two immature birds spent the whole summer. A snowy egret wearing the exquisite, lacy nuptial plumes of an adult bird ready to breed, spent June and half of July at the lake. Snowies are also endangered here. They are known to nest in only two locations in the whole state. More adults showed up for the last half of July, and Milosevich saw a group of two adults and two immatures at the end of August. His cold-blooded, objective, scientific side, reports "no evidence of breeding," but his enthusiastic, hopeful, birder's side says "I keep looking."

The question now is whether there will be a place for him to look. Will County Audubon Society has been pushing for three years for protection for Lake Renwick. The Will County Forest Preserve District has agreed to buy it, and a federal grant has been obtained to pay for half of the purchase. The state has agreed to pick up another 25 percent of the tab, and a private organization based in Chicago, The Upper Illinois Valley Association, a group consisting mainly of prominent business leaders who are interested in making a reality out of the I&M National Heritage Corridor, has agreed to raise funds to cover the other 25 percent.

Chicago Gravel is eager to unload the property. They are not making any money from it and they are still paying taxes on the land. The vexed question is the

Ninth Annual Spring Systematics Symposium
Saturday, May 10, 8:50am to 4:30pm

This year's symposium topic is "Evolution of Human Hunting" and features ten speakers. The preregistration fee (until April 10) is $10. Registration after that date is $15. Registration forms may be obtained by writing Dr. H. M. Nitecki at Field Museum; they may also be obtained at the Museum on May 10 before the talks begin.

value of the place. Will County's appraisers have come up with a figure that is about half of what Chicago Gravel's appraisers think is a fair price. The company has come down from that first figure, but there is still a yawning gulf between the parties. At this writing, the county is beginning proceedings to exercise its right of eminent domain, so it will be up to a court to determine a final price.

If all goes well, the county will take over the property and administer it as a nature preserve. Their plans call for some marsh restoration along the shore lines, a new fence around the property, and an absolute minimum of human interference with the birds. An observation tower, or if that seems too obtrusive, some observation blinds, could be put up along the north shore. With them in place, the lake could be a splendid educational resource, a chance for close and continuing scrutiny of the birds.

But problems may be developing. Human activity made this rookery possible, and it may take more such action to keep it healthy. The rookery islands are tiny things, not much more than six feet wide and less than 200 feet long. The box elders that invaded them have now endured more than two decades of herons, and some of the trees are beginning to collapse under the strain.

A rookery is a place that only a heron could love. A little excrement is great fertilizer, but the constant rain of droppings from all those big birds may be too much of a good thing. And then there is the mechanical damage produced by all those thousands of takeoffs and landings. And if that isn't enough, beavers in the lake are apparently thinning out some of the understory trees. There are rookeries elsewhere whose nests are built on man-made platforms, and that kind of construction may become necessary at Lake Renwick.

And then there are all those great blue herons. They are the earliest arrivals in the spring and they nest in the very tops of the trees. It is possible that their constantly growing presence will eventually do harm to the species that nest below them.

Nature has means of dealing with these problems. In the old days, herons just moved if the trees fell down. If great blue herons messed up the lives of black-crowned night herons, the night herons sought another nesting place. But the facts of life today are that humans have destroyed the other nesting places. It may take thoughtful, cautious intervention to ensure that we keep getting the good out of this gravel pit. FM

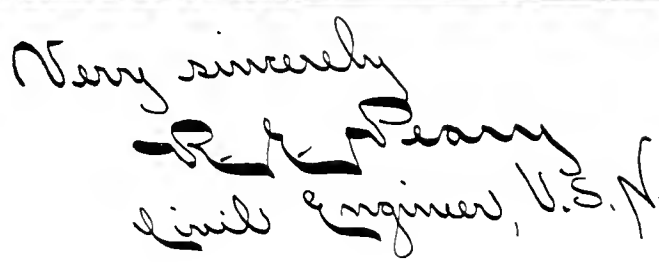
Great blue heron

Robert E. Peary: Arctic Explorer and Collector for the World's Columbian Exposition

by

James W. VanStone

Curator, North American Archaeology and Ethnology



The Polar Eskimos of Smith Sound, northwest Greenland, have long been famous as the most northern peoples in the world. When first contacted by the British explorer John Ross in 1818, they had lived in isolation for so long that they believed themselves to be the only people in the world. It is therefore remarkable that Field Museum possesses the earliest ethnographic collection from these remote peoples, acquired at the time the institution was established following the close of the World's Columbian Exposition in 1893. The means by which this collection was obtained represents an interesting footnote to the early history of Field Museum's ethnographic holdings.

In 1891, Frederic Ward Putnam, curator of the Peabody Museum of American Archaeology and Ethnology at Harvard University, was appointed chief of the

Department of Ethnology and Archaeology for the World's Columbian Exposition. His task was to assemble a large anthropological collection for the 1893 world's fair, and for this purpose field parties to various parts of the world were directed to collect ethnographic objects and other materials representing many different cultures. One of these parties, an expedition to northwest Greenland, was under the command of Lieutenant Robert Edwin Peary of the United States Navy.

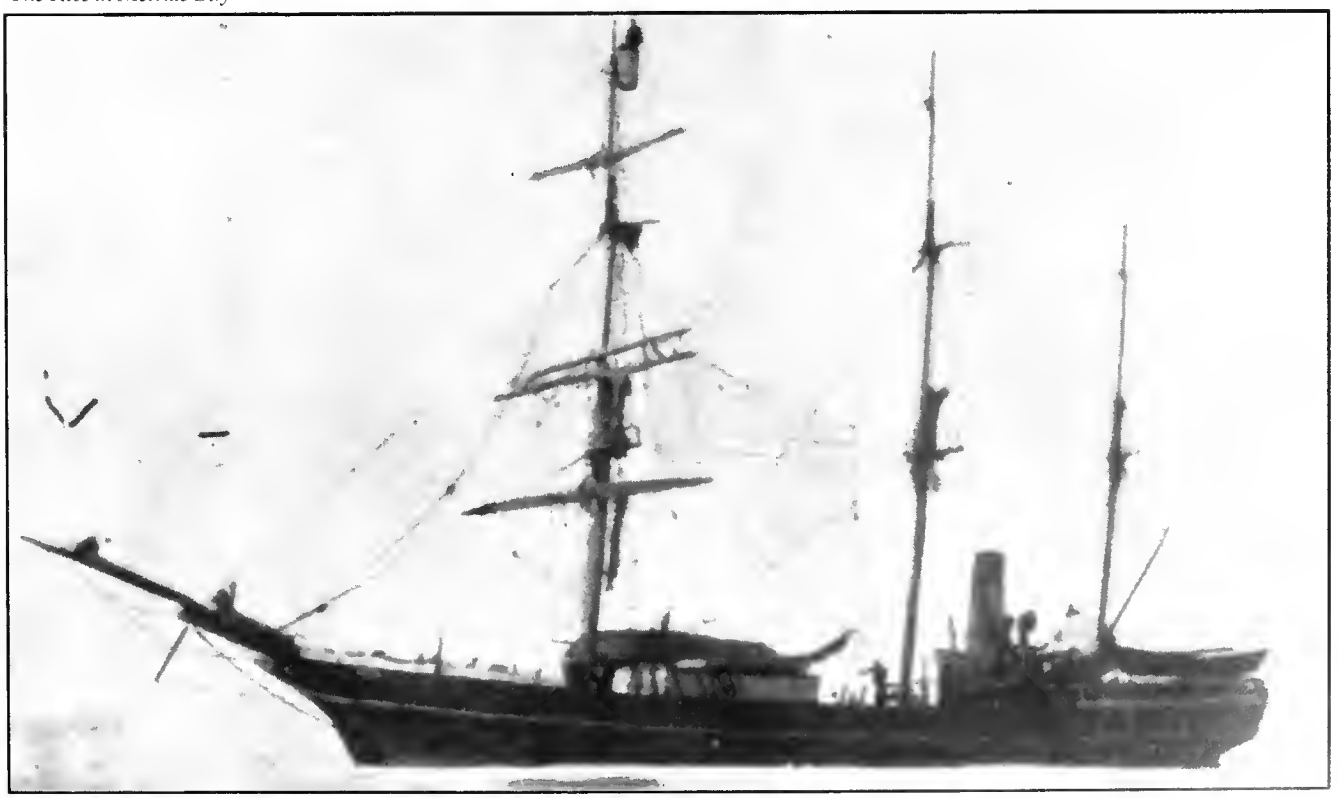
Lieutenant Peary eventually became a rear admiral and received worldwide recognition for his arctic explorations, particularly his achievement in reaching the North Pole in 1909. In 1891, however, he was serving as chief engineer at the Philadelphia Navy Yard. He received an appointment to lead an arctic expedition for the American Geographical Society and the Academy of Natural Sciences in Philadelphia. It was during this expedition (1891-92), the first of four to the country of the Polar Eskimo, that Peary made the collection for Putnam and the World's Columbian Exposition.

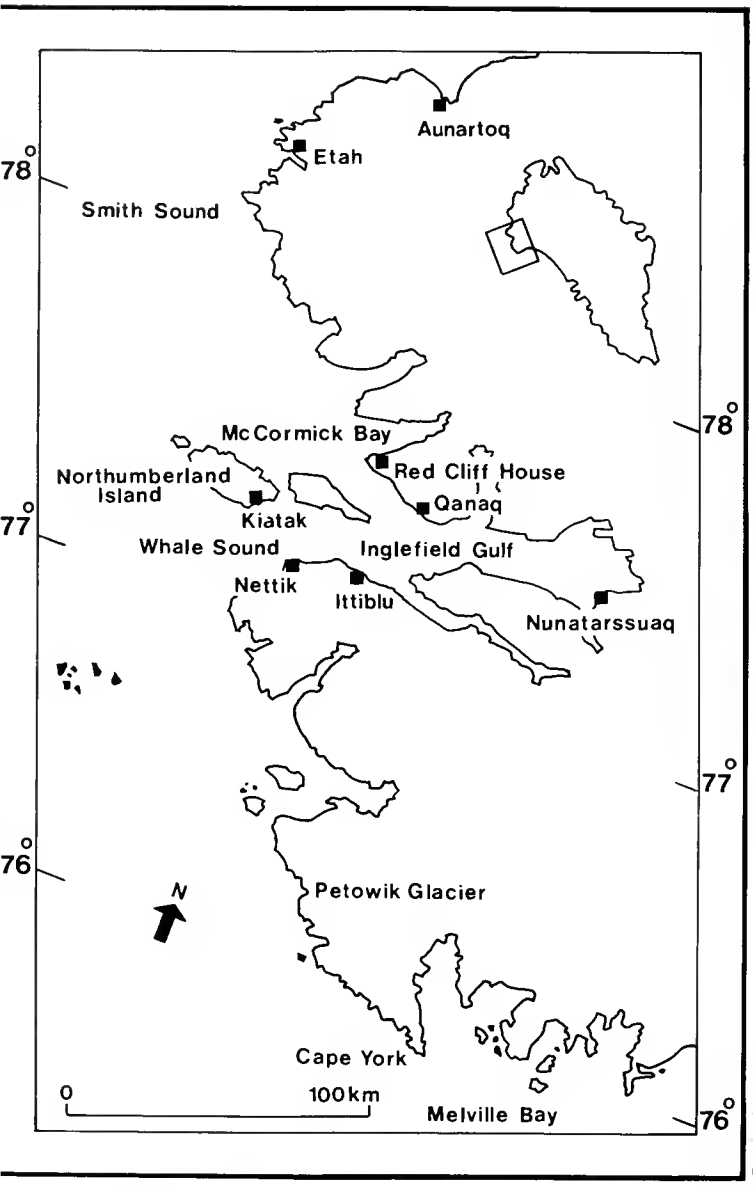
Putnam obtained an appropriation of $10,000 from the executive committee of the exposition to be used for the purchase of ethnographic specimens from members of expeditions about to depart for various parts of North America. The principal goals of Peary's Greenland expedition were to determine the northernmost extension of the subcontinent and to collect materials and information of scientific interest. Putnam agreed to pay $2,000 for ethnographic and archaeological materials from the Polar Eskimo and specifically requested that Peary make as complete a collection as possible.

The North Greenland Expedition, as it came to be called, was originally conceived on a modest scale. Eventually, Peary received more support than he had anticipated and Putnam soon realized that the expedition would not be devoted to the collection of materials exclusively for the world's fair. He became worried that he might not obtain all the materials necessary for his conception of the exhibition if other institutions were to receive a share of the collected objects. After some negotiations, a memorandum of agreement between Peary and Putnam was drawn up on June 2, 1891, just three days before the expedition sailed. It read in part as follows:

> Mr. Peary to be appointed by Mr. Putnam as Special Assistant in charge of Ethnological and Archaeological work in Greenland for the World's Columbian Exposition, and is to obtain all objects possible, illustrative of the life and customs and the arts of the Arctic Highlanders inhabiting the Whale Sound region, in particular, and such other natives of Greenland as may be practical; also photographs and measurements of the people, and, if possible, moulds of a man, woman, and child, for the purpose of making models

The Kite in Melville Bay





Zbigniew Jastrzebski

Smith Sound region of northwestern Greenland (map of Greenland inset upper right).

of actual life size in every particular. Also all objects of past and present times he may be able to secure, relating to the life of the people, their weapons, utensils, ornaments, etc. and several sets of garments with which to dress a series of models of men, women, and children. Also a stone house, to be so taken down and to be rebuilt in Chicago by the aid of drawings and photographs and descriptions; with this house to be all its contents—beds, lamps, utensils, etc. Also, drawings and photographs of a snow house, so that a model of one can be made in Chicago; the contents of such a house also to be secured for furnishing the model. Several skeletons and contents of graves to be secured and if possible, a large number of skulls of the natives. If any native boats exist among the people, one or more to be secured. Sledges and skins of dogs to be secured, both with full harness; and the skins of native mammals and birds used by the natives for food and dress. In fact all objects relating to the conditions of life of the people.

Dr. Frederick A. Cook

The North Greenland Expedition, including Peary's wife, sailed in the steam sealer *Kite*, reaching Godhavn, Greenland on June 27 and Upernavik on July 1. On July 11, Peary broke his right leg and was unable to take an active part in the affairs of the expedition until September. A permanent camp, named Red Cliff (or Redcliffe) House, was established in McCormick Bay at the entrance of Inglefield Gulf on July 25. A dwelling was set up and four days later the *Kite* left the party and headed south.

The expedition's surgeon and ethnologist was Dr. Frederick A. Cook, who later gained considerable notoriety for his claims to have reached the North Pole before Peary. It is likely that the bulk of the ethnographic objects collected specifically for the World's Columbian Exposition were obtained by Dr. Cook.

On July 24, just before reaching McCormick Bay, the *Kite* stopped at Nettik, a small Eskimo village of three tents on Whale Sound where according to Mrs. Peary, "we hoped to obtain a native house, sledge, kayak, and various utensils for the World's Columbian Exposition." Knives, saws, files, and other tools were traded for seal skins and narwhal tusks. The only ethnographic objects mentioned are a "skin house with its interior fittings complete," and a sledge, all of which were obtained in exchange for a hatchet, a saw, and two files.

These ethnographic materials were shipped back

on the *Kite,* and in a letter dated July 29 which Lieutenant Peary sent on the ship to Putnam, he mentioned erroneously that most of the objects were obtained at a settlement called Ittiblu approximately 23 km. further up Whale Sound from Nettik.

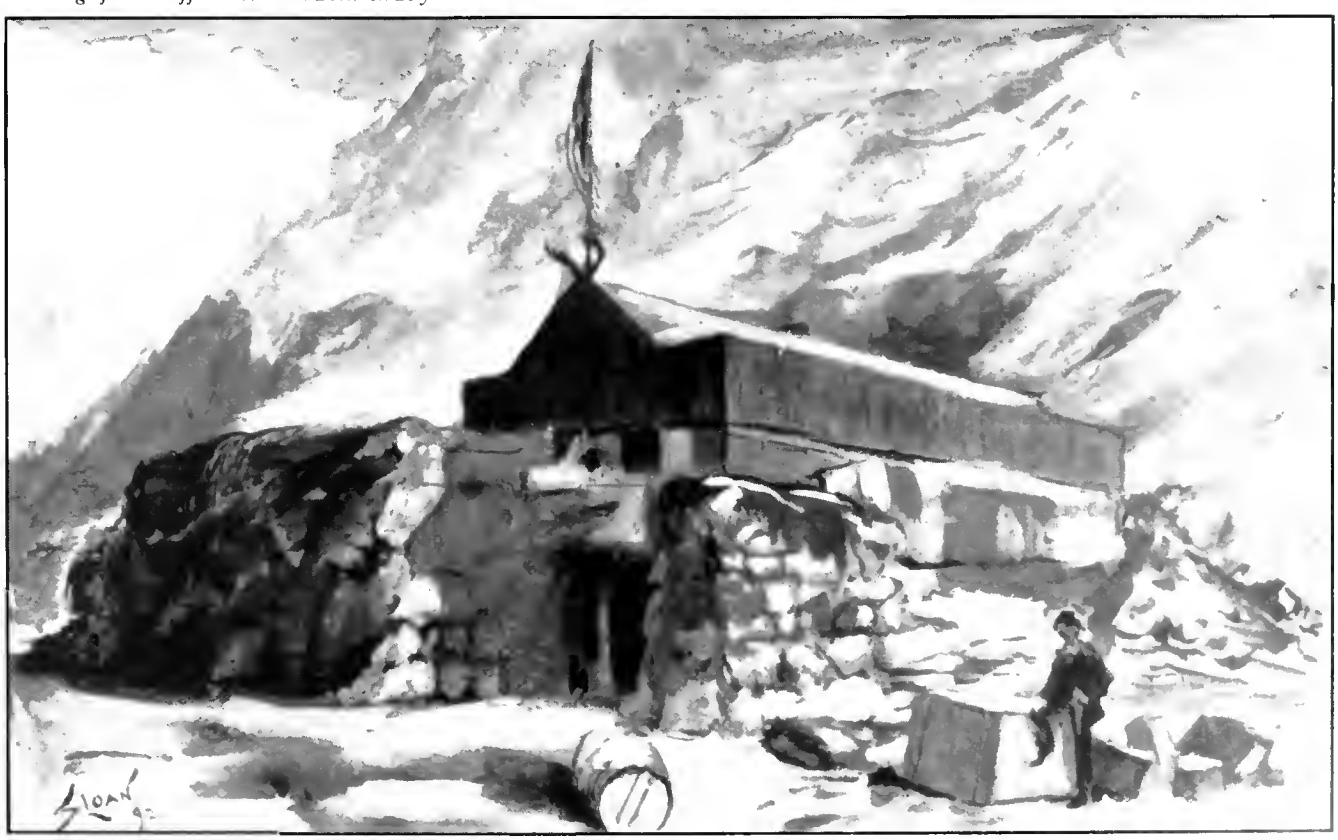
After leaving Peary and his small party on the shores of McCormick Bay, the *Kite* stopped at an Eskimo settlement on Cape York. Here representatives of the Academy of Natural Sciences made a fairly sizeable collection of ethnographic material. The Cape York Eskímos appeared to have had more contact with Europeans or with Eskimos to the south than the residents of Nettik, as there was more evidence of the use of iron and wood.

Lieutenant Peary with broken leg

Meanwhile, in mid-August Peary's explorations in the vicinity of the permanent camp got under way with a boat trip to the islands in the vicinity of McCormick Bay. Dr. Cook traded for ethnographic objects at a small village of 13 inhabitants called Kiatak on Northumberland Island. He noted that each man in this settlement possessed a kayak, a harpoon, a lance, and a bird net. Two possessed bows and arrows, a number of rolls of sealskin line, and some narwhal sinew.

Beginning in early November, a number of Eskimo families began to arrive at Red Cliff House. By November 7 there were 17 men, women, and children living around the camp and other families arrived and departed throughout the winter. Dr. Cook made anthropometrical measurements of 75 individuals during the winter and Peary himself obtained a complete series of photographs of the same persons. Dr. Cook appears to have taken the census, enumerating a total of 233 Polar Eskimos. Whether or not any of this non-artifactual material was turned over to Putnam along with the ethnographic objects cannot be determined. The photographs and census data were published in Peary's book dealing with the expedition.

Drawing of Red Cliff House—McCormick Bay



Mrs. Peary distributing household items

In April Peary made a sledge trip around the southern and eastern shore of Inglefield Gulf and stopped at several villages to obtain dogs and purchase walrus meat, furs, and other equipment for planned explorations to the north. The Eskimos encountered were anxious to barter their possessions and although there is no mention of specific items, it is likely that ethnographic objects were obtained. In any event, considerable amounts of trade goods were distributed in exchange for the items Peary required.

It was in the spring of 1892 that the major work of the expedition was carried out. Departing from Red Cliff House in late May, Peary and one companion, proceeding overland, reached the head of Independence Fjord at 82° N. latitude on July 4. By August 6 they were back on the shores of McCormick Bay. During Peary's absence, Dr. Cook obtained ethnographic objects from the Eskimos living at Red Cliff House in exchange for pieces of boards, barrel staves, boxes, and miscellaneous lumber fragments no longer needed by the expediton.

The *Kite*, meanwhile, had left Philadelphia on July 5 to pick up Peary and the members of his party. The vessel reached Cape York on July 22 and on the following day put ashore once again at the settlement of Nettik on Whale Sound. Here representatives of the Academy of Sciences secured a "rich" collection of ethnographic material in exchange for needles, knives, scissors, thimbles, and other useful items. Late at night on July 23 the *Kite* reached Peary's winter quarters to find that the lieutenant had not yet returned from his trip to the north.

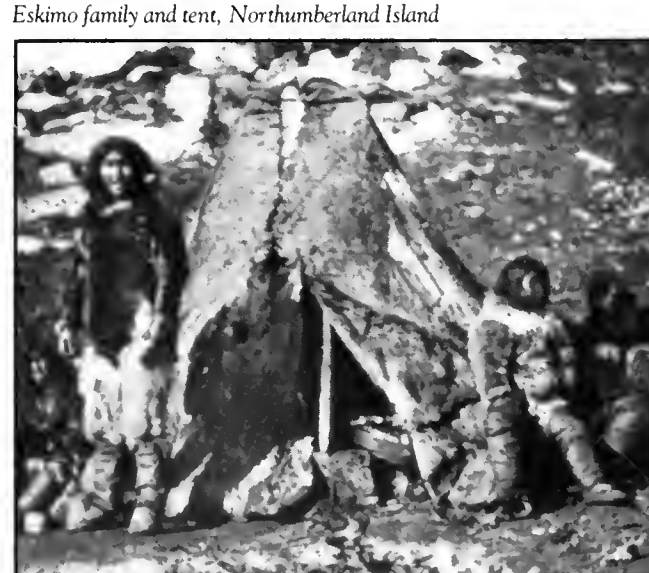
On August 9, three days after his return from the overland expedition, Peary set out on a second trip to Inglefield Gulf, this time by boat. One of the purposes of this trip, which lasted approximately one week while the *Kite* was standing by, was to obtain ethnographic objects at the villages called Qanaq and Nunatarssuaq. These materials had been promised by residents of the settlements during the winter and at the time of Peary's first trip in April. Unfortunately, neither Lieutenant nor Mrs. Peary's accounts of this brief expedition into the Gulf make any further mention of these objects or whether they were, in fact, obtained. In any event, the ethnographic material secured throughout the year was shipped out on the *Kite*, which left McCormick Bay on August 24 and reached Philadelphia on September 24, 1892.

As a result of Peary's letter of July 29 and information transmitted through the Academy of Natural Sciences, Putnam, who had no way of knowing what might be collected during the winter and spring, became concerned at the meager amount of material he was going to receive. He also was unhappy to learn that part of what had been obtained was to be assigned to the Academy. As a result, he balked at making the final payment of $500 due Lieutenant Peary at the conclusion of the expedition.

Just how much of the collection went to Philadelphia cannot now be determined with certainty. The academy would certainly have been justified in retaining those items collected at Cape York by its representatives on board the *Kite* in the late summer of 1891 and at Nettik in July, 1892. That institution no longer has ethnographic collections, and the present whereabouts of their Polar Eskimo material is unknown.

A note in the accession files of Field Museum's Department of Anthropology states that "the bulk of the

Eskimo family and tent, Northumberland Island



collection is now in the Columbian Museum." Putnam was thus apparently successful in acquiring most of the collection for his exhibition. Even that amount, however, was apparently a good deal less than he expected, although it at least approximated what was mentioned in the memorandum of agreement. However, considering the fact that Peary was in almost constant contact with Eskimos throughout the winter and spring of 1891-92 and frequently traded with them for meat and skins for clothing, it is difficult to escape the conclusion that the acquisition of an ethnographic collection, although of some interest, was not particularly high on his list of priorities for the expedition.

At the conclusion of the world's fair, the scientific collections which had been acquired with exposition funds were turned over to the Field Columbian Museum as a nucleus to found the institution subsequently renamed Field Museum of Natural History. Putnam became curator of Anthropology at the American Museum of Natural History on a part-time basis and continued his association with Peary. During the latter's next expedition to Greenland in 1893, he began a collection of Polar Eskimo material for the American Museum. This collection was augmented on future trips and was eventually published by A. L. Kroeber, a student of Franz Boas at Columbia University.

Up to 1891 when Peary began his series of expeditions to the Smith Sound region, little change had occurred in Polar Eskimo life. Limited amounts of wood and metal had been obtained from whalers, early explorers, and through trade with Eskimos to the south and these exotic materials enabled the people to improve their hunting gear and other equipment to a limited extent. However, their culture was, in all essentials, virtually untouched by outside contacts.

During four expeditions over a period of six years, Peary supplied Eskimo families that helped him (which at one time or other included virtually everyone in the area) with considerable amounts of hardwood, food, guns and other weapons, thimbles, needles, metal knives, steel traps, tobacco, and many other items. Writing with reference to the early years of the present century, the Danish anthropologist Knud Rasmussen stated emphatically that "it is Peary who has given the tribe its present effective equipment for winning a livelihood."

An example of the largesse with which the Eskimos must have associated the appearance of Peary on their coast occurred at the end of the expedition which acquired the items of material culture for the World's Columbian Exposition. In early August of 1892, as the *Kite* waited off the coast of McCormick Bay, Peary wrote that his wife

The Kite *at the wharf in Philadelphia*

> . . . distributed the household utensils to the delighted women of the village, and then both women and men were assembled upon the beach, and everything I did not care to take home with me given to them, together with untold wealth sent them [on the *Kite*] by kind friends of the expedition in Philadelphia, in the shape of wood, knives, iron kettles, etc.—treasures priceless to the Eskimo mind.

Since this scene was to be repeated many times in the future, it is little wonder that Peary could write at the conclusion of his fourth expedition in 1897: "The effect of my expeditions upon these children of the North has been to raise the entire tribe to a condition of affluence." FM

NOTE

This article is adapted from J. VanStone, "The First Peary Collection of Polar Eskimo Material Culture" (*Fieldiana: Anthropology*, vol. 63, no. 2, 1972). Most of the information and illustrations presented here were obtained from the following sources:

Davis, G. G. and R. N. Keely
1892 In Arctic Seas. The Voyage of the *Kite* with the Peary Expedition. Rufus C. Hartranft, Philadelphia.

Peary, J. D.
1897 My Arctic Journal. A Year Among the Ice-Fields and Eskimos. The Contemporary Publishing Co., New York.

Peary, R. E.
1898 Northward over "Great Ice." A Narrative of Life and Work along the Shores and upon the Interior Ice-Cap of Northern Greenland in the Years 1886 and 1[illegible] 2 vols. Frederick A. Stokes Company, New York.

Henry Field

1902 - 1986

by W. Peyton Fawcett
Field Museum Librarian

Field Museum learned with deep regret of the death in early January of a long-time friend and former curator, Dr. Henry Field. Dr. Field was a native Chicagoan, born in 1902, and a grandnephew of the Museum's founder, Marshall Field.

Most of his early life was spent in England where he received his education, first at Eton College and later at Oxford University, from which he received the degrees B.A. (1925), M.A. (1929), and Doctor of Science (1937). "My first desire," Dr. Field has written, "after graduating from Oxford, was to work in a museum, and it had been my dream since childhood to return someday to Chicago. Both desire and dream were to be realized, for I received an appointment as Assistant Curator of Physical Anthropology, at Field Museum of Natural History." Dr. Field served as assistant curator (later curator) from 1926 to January of 1941. He left the Museum in 1941 to become an advisor to President Franklin Roosevelt during World War II. After the war he was engaged in largely private research, but he also held appointments at the Peabody Museum of Harvard University and the University of Miami, among others.

Henry Field (1940s)
78453

Dr. Field's years at Field Museum were especially productive ones. He was a member, or leader, of a number of expeditions, including the Field Museum-Oxford University Joint Expedition to Kish, Iraq; the Marshall Field Archaeological Expedition to Western Europe; the Marshall Field North Arabian Desert Expeditions; and the Field Museum Archaeological Expeditions to Western Europe. These expeditions resulted in important additions to the Museum's collections, three major exhibits, and a number of scientific works published in the Museum's *Fieldiana* series, including *Arabs of Central Iraq, their history, ethnology, and physical characters* (1935); *Useful plants and drugs of Iran and Iraq* (with David Hooper, 1937); and *Contributions to the Anthropology of Iran* (two volumes, 1939). The last work was translated into the Persian language (Farsi) and published in Tehran in 1966.

During his tenure Dr. Field planned and directed two major exhibits, the Hall of Races of Mankind, containing 100 sculptures by Malvina Hoffman, and the Hall of Stone Age of the Old World, with eight large dioramas by Frederick Blaschke. He also participated in planning the Hall of Mesopotamian Archaeology. To accompany these exhibits Dr. Field wrote many articles in the *Field Museum News*, precursor of the present *Bulletin*, and several works in the *Popular Series: The Races*

of Mankind (four editions, 1933-42); *Prehistoric Man* (three editions, 1933-41); and *The Field Museum-Oxford University Joint Expedition to Kish, Mesopotamia, 1923-1929* (1929).

Dr. Field's popular works most clearly display his genuine delight in his scientific studies and, in particular, the travels and expeditions that accompanied them. He was a graceful writer, able to communicate his knowledge and enthusiasm to a general audience. This is most clearly demonstrated in his *The Track of Man: Adventures of an Anthropologist* (New York, 1953). This immensely successful work was reprinted many times. Persons interested in anthropology and Field Museum will find it a very rewarding book. In later years Dr. Field published three other autobiographical works: *Arabian Desert Tales* (1976, revised edition 1977); *Trail Blazers: Chicago to Moscow* (1980); and *The Track of Man: Volume 2, The White House Years, 1941-1945* (1982). These and other works by Dr. Field may be consulted in the Museum's Library, which possesses a large number of his more than 850 scientific and popular books, papers, and articles. A list of these may be found in his *Bibliography: 1926-1976* (1976).

Dr. Field's interest in Field Museum was a continuing one that was still strong 35 years after he had left. The Library, in particular, has been augmented by his many gifts of books and papers over the years, culminating in the gift of his library of over 1,000 volumes on Southwestern Asia, including many early works on travel and exploration. A later gift of archival material was received, including reports and diaries, and a copy of the typescript of *The Track of Man.*

Dr. Field has left a body of useful work that will be long remembered at Field Museum and elsewhere. He is still remembered at Kish, though for a somewhat different reason, as evinced by this anecdote related by a Field Museum Member: During the Museum's excavations at Kish, probably in the late 1920s or early 1930s, Dr. Field "managed to get his open touring car from Beirut to the site—an expedition in itself. In 1974 a member of the Field Museum was in Iraq [and] went to Kish with an archaeologist who had dug there too. As they were wandering through the ruins they were joined by some children from the village. The member mentioned to his companion the name 'Henry Field.' Suddenly the children came to life. One started dancing in a Charleston-type fashion. Another pretended to be driving a car, crouching over a pretend steering wheel and making appropriate noises — everyone getting into the act. These children were at least two generations younger than the man who *had* worked for Henry Field, but he had made such an impact on the village, taking them for rides, teaching them dancing that he was a legend in his time." FM

Tours for Members

North Cape and Spitzbergen

June 27-July 12
$3,550-$6,440

Sail to the Land of the Midnight Sun, to the North Cape, where the sun shines 24 hours a day, aboard the "ultra deluxe" *Vistafjord*. This Five-Star ship represents the very epitome of ocean-going elegance: impeccable service, first-class cuisine, dazzling entertainment, luxurious living, and unrivaled attention to detail.

June 28. Embarkation from Hamburg, Germany. Here on the River Elbe is one of Europe's brightest and most exciting cities. Explore the entertainments of the St. Paul district, go sightseeing to City Hall and shopping along the busy Mockebergstrasse, or drive out to the peace and quiet of the picturesque Alster Lakes.

June 30. Molde, Norway. An unusually warm climate graces this delightful Norwegian town, which lies in the path of the Gulf Stream. Of special note: Romsdal Museum, an open-air compound of carefully assembled wooden houses dating back to the time of the Vikings. Aandalsnes, Norway. This small, picturesque village on the banks of the Rauma River lies below the soaring mountains and tumbling waterfalls of the Romsdal Valley. Ascend Stifjell mountain and cross the lofty bridge over Stigfoss Waterfalls. There are superb views down the Isterdal Valley, a fertile land filled with quiet peaceful farms.

July 3. Magdalena Bay, Spitzbergen. Massive glaciers in Spitzbergen's mountains inch their way down to the sea and Magdalena Bay, providing one of the world's most awesome natural spectacles. Cruising Lillehhok Fjord. Sailing past New Aalesund.

July 4. Longyearbyen, Spitzbergen. This is Spitzbergen's main settlement, located at the head of Advent Bay. It looks out on a coastline of seals, walrus, whales, and thousands of seabirds. Longyearbyen was named by an American engineer who founded it in 1906; the search for coal is still pursued in nearby Barentsburg.

July 5. Skarsvaag, Norway. Here is the most northerly point in Europe. Up the road and across the tundra from Skarsvaag, you will have a rare and awe-inspiring opportunity—a chance to stand on 1,000 ft. cliffs with nothing but polar ice-pack between you and the Arctic Ocean. In the summer, as you shall see, the sun shines all the time—24 hours a day.

July 6. Hammerfest, Norway. The brightly painted houses of the world's most northerly town contrast greatly with the harsh hills which are its backdrop. The attractive little shops offer a wide array of fine crafts, and the Hammerfest Museum records more than 200 years of the town's rich history.

Tromso, Norway. Sheltered by the islands along this craggy coastline, Tromso has long been an important fishing port and the largest city along the Arctic Circle. It was from Tromso that the famous explorer Admundsen staged his great expedition to the North Pole.

July 7. Narvik, Norway. This shipping port along the ice-blue fjords is surrounded by snow-tipped peaks that rival any in the country. Visit the crystal clear Rombaksfjord, which can be crossed via a magnificent new suspension bridge, then continue on to Bjerkvik and Gratangen, where you'll be surrounded by some of northern Europe's most beautiful wildflowers.

July 8. Sailing past the Arctic Circle and several seaside towns.

July 9. Hellesylt, Norway. An excellent starting point for excursions through a land where mountains soar to dizzying heights and waterfalls spread their lacework across the cliffs. Visit the orchards strung together in a brilliant garland of blossoms.

Geiranger, Norway. Geiranderfjord is one of the most splendid in all of Norway, enclosed on both sides by precipitous walls of rock. Visit Geiranger's tiny octagonal church, ascend Mt. Diasnibba and take in a magnificent panoramic view of the mountains, lakes and waterfalls. And save time to visit Tystig branch of Europe's most enormous glacier.

July 10. Bergen, Norway. This town of seven hills was founded in 1070 and is now one of Norway's major seaports. Windows on its past include the 13th-century fortress of Bergenhus, the Rosenkrantz Tower and Edvard Grieg's home at Troldhaugen, while present day Norway is typified by the busy fish and flower market.

July 12. We disembark in Hamburg, Germany.

Bertram G. Woodland, curator of petrology at Field Museum, will accompany the tour. He received his B.Sc. (honors) at the University of Wales and his Ph.D. at the University of Chicago. He will enrich this lovely cruise with his thorough knowledge of the rock formations and geologic history of the fjords, and discussions on the many interesting excursions. Working as a lecturer/tour leader is not a new experience for Bert, as he has escorted Field Museum groups through England and Wales (his native country), Galena, Illinois and several Grand Canyon rafting expeditions.

English Homes and Country Tour

July 1—15

$2,725 (double occupancy)

The "treasure houses" of Britain are best experienced within their architectural context and amidst their natural landscapes. Here we travel the paths of history and culture in the most immediate sense. But unlike most tours that rush you around for a cursory introduction, Field Museum is offering the discriminating traveler an opportunity to get to the heart of the English people and live in the English countryside as they do. The English are a thoroughly hospitable people, making you feel truly welcome as they take you into their comfortable homes as a guest of special importance. Past travelers have made lasting friendships with their hosts, returning again and again, even reciprocating the welcome as their English friends visited here. This view of a remarkable country is rare indeed, and especially relaxing since you stay several days in one home instead of spending your time on a bus. We stay in the southeastern counties where charming thatched villages complement vast cathedrals and living hedgerows set off lush royal gardens. Your hosts and hostesses include baronets, generals, company directors, doctors, members of Parliament, and landowners. Their homes range from mansions to more modest yet extremely comfortable cottages. Accommodations include use of a private bathroom.

Come and visit this 'tied to the past' yet forward-looking and charming country. Inquire into the customs and foibles of the people as you tour with not only a local guide, but with a scholar from Field Museum, who was born and raised in this remarkable country. Dr. Peter Crane got his Ph.D. in botany at the University of Reading. He is an associate curator in the Department of Geology at Field Museum and was recognized as one of ten "Outstanding Young Citizens" by the Chicago Junior Association of Commerce and Industry in 1985. He is excited about this unusual travel opportunity in his native country and invites you to join him and his countrymen in an exploration of English Homes and Country.

July 1. Depart Chicago O'Hare for Heathrow.

July 2. Arrive Heathrow. Met by tour director; board luxury coach for drive to Canterbury. Meet hostesses and drive to their homes to unpack and freshen up before lunch. At leisure for the rest of the day. In the evening dinner with hostesses.

July 3. Canterbury. A day in and around Canterbury. First a tour of the cathedral personally introduced by a canon from the cathedral staff, followed by a wander in Canterbury before lunch. After lunch further time to wander in Canterbury before visiting the village of Fordwich, which has the oldest town hall in England. Dinner in a private house.

July 4. South Kent. Drive south to the Cinque Port of Rye with its steep cobbled streets and period houses, and the world famous Mermaid Pub. A short drive to Bodiam Castle, built in 1386 to defend the Rother Valley from incursions by the French, followed by lunch at the Castle Pub. Another short drive to Great Dixter, a house built about 1450 (not long after Chaucer) and which now has a lovely garden containing a wide variety of unusual and interesting plants. Dinner in a private house.

July 5. Mid-Kent. After breakfast a leisurely drive to Leeds Castle for a private tour of what was described by Lord Conway as the "loveliest castle in the world." On through typical Kent countryside to Sissinghurst Castle, with its well-known and very beautiful garden. After lunch in the Castle restaurant, a short drive to Godinton Park for a private visit to this mansion with its fine Stuart panelling, carving, and magnificent furniture and porcelain. Dinner with hostesses.

July 6. Travel To Cambridge. Goodbye to the Canterbury hostesses. A short drive to the great Norman cathedral at Rochester in the heart of Dickens country where those who wish may attend a service. Then by tunnel under the River Thames northward into the county of Essex for lunch in a Tudor pub. After lunch a drive through the changing East Anglian countryside to meet and dine with Cambridge hostesses.

July 7. Suffolk. A day in Suffolk countryside immortalized by artist John Constable. First to Newmarket, home of the Sport of Kings, and center of the racing industry for a private tour of the Gallops, Tattersalls Selling Ring and Jockey Club for sherry. Lunch in Newmarket before driving to the medieval town of Bury St. Edmunds with its beautiful cathedral. In the late afternoon a short drive to Lavenham with time to explore the Guildhall dating from the 1520s, and the most splendid of all "Wool" churches before dining in one of the oldest buildings in Lavenham, the famous Swan Hotel.

July 8. Cambridge. A day in and around Cambridge, first visiting historic colleges and churches including Kings College Chapel, followed by a visit to the American Military Cemetery at Madingley which commemorates those Americans who died in northwest Europe in World War II. Lunch at a private house close to Cambridge. The afternoon in Cambridge exploring the city before dining with hostesses.

July 9. Travel To Chichester. After bidding farewell to Cambridge hostesses a drive south to West Sussex bypassing London to the west, and stopping for a pub lunch on the way. In the afternoon visit the Royal Horticultural Society Gardens at Wisley. These world-famous gardens contain an extraordinary collection of plants, flowers, trees, and shrubs, and attract visits by horticulturists from all over the world. A further journey to meet and later dine with hostesses.

July 10. Chichester. First to Bosham to visit Trinity Church of King Canute fame before going to Chichester for a stroll through the Pallants to the Hospice of St. Mary, then lunch in the Dolphin and Anchor. A Private tour of the Cathedral and free time to explore before having supper at the Festival Theatre Restaurant and attending a performance at the theatre.

July 11. Winchester. A drive west, skirting Portsmouth and Southampton, to Broadlands, home of the late Lord Mountbatten. A short drive to Winchester for lunch in the Wessex Hotel before visiting the cathedral and wandering in its environs. Return to Chichester through the rolling countryside of West Sussex. Dinner with Hostesses.

July 12. Mid-Sussex. Visit Boxgrove Priory which dates from the 12th century. A short drive to the thatched village of Amberley which nestles at the foot of the Downs. A pub lunch. Then to Petworth, a magnificent late 17th-century house which includes among its treasures works by Van Dyke and Turner, and a Grinling Gibbons room. A private dinner at Goodwood House followed by a tour of this historic home of the Dukes of Richmond and Gordon.

July 13th. Travel to London. Goodbye to Chichester hostesses, and drive to London for an orientation tour through the West End and City before arriving at the Mandeville Hotel and settling in there before lunch. Free afternoon and evening.

July 14. London. Free day and evening in London. The booklet on London in the personal folders given to each guest on arrival in England lists places of interest, how to get there and times of opening. A private tour of the Palace of Westminster, provided the Houses of Parliament are not in recess, will be arranged for those who wish.

July 15. Tour Ends. Those returning home will be escorted to London Heathrow by our tour director. Arrive Chicago O'Hare.

Alaska

$4,885

July 2-16

Experience the Great Land. Descriptions of Alaska are filled with superlatives—a state more than twice the size of Texas with a population less than that of Denver, 33,000 miles of coastline, 119 million acres of forest, 14 of the highest peaks in the United States culminating in Mt. Denali (formerly Mt. McKinley), at 20,320 feet. Alaska is equally a land of wildlife superlatives, from her great herds of caribou to swarming seabird rookeries to surging salmon in migration. When one thinks of Alaska one thinks of wilderness, of nature still fresh and undomesticated, of experiences dreamed of but mostly unavailable to us of the lower 48.

Join us for an Alaskan odyssey through a wide range of habitats from the rockbound fur seal and sea bird colonies of the Pribilofs, to the dripping forest and calving glaciers of the southeast, to the grandeur of the Alaskan Range, to the Fjordlike quiet and beauty of the inland passage.

Our travels will be by plane, train, bus, boat, and foot—whatever best enhances our experience. Emphasis will be on the land, its history, its wildlife. Interpretation combined with direct observation will provide an enjoyment and quality of experience unavailable to the casual visitor. Whatever your interest in natural history—marine mammals, birding, mountains, photography, flowers, forests, glaciers, rivers—this tour will show you Alaska in all its diversity and splendor.

Dr. David Willard, manager of Field Museum's bird and mammal collections, will be tour leader. He received his Ph.D. in Biology at Princeton University, where he was acting curator of Princeton Museum of Ornithology. He has been on a number of research expeditions for Field Museum. His experience in bird and animal identification and his experience as a tour leader will enrich this expedition for you. He invites you to share in the beauty of Alaska this summer.

July 2. Fly Chicago to Sitka; welcome dinner; overnight Sitka Sheffield Hotel.

July 3. Breakfast at hotel; morning city tour with stop at Raptor Center; lunch; late afternoon marine wildlife trip on private yacht *Taku Queen;* weather permitting, cruise to St. Lazaria National Wildlife Refuge; dinner on board; overnight Sitka Sheffield Hotel.

July 4. Breakfast at hotel; morning flight to Juneau; Mendenhall River Float Trip with lunch along the river; tour Mendenhall Wetlands; late afternoon options available: flightseeing, helicopter onto Mendenhall Glacier or a guided hike; evening outdoor salmon bake; overnight Sheffield Hotel Juncau.

July 5. Breakfast at hotel; morning flight to Glacier Bay; Glacier Bay cruise aboard the MV *Glacier Bay Explorer;* overnight on board the *Explorer;* lunch and dinner on board *Explorer.*

July 6. Cruising Glacier Bay in morning; return to Glacier Bay Lodge for lunch; afternoon flight to Juneau and on to Fairbanks. Dinner and overnight at Fairbanks Inn.

July 7. Breakfast at hotel; Alaska Railroad to Denali National Park; lunch at the Park entrance; afternoon free to see park service exhibits, slide shows and films; salmon bake dinner; overnight McKinley Chalets.

July 8. Early morning breakfast at the chalets; 6 a.m. departure by private bus through Denali National Park for wildlife viewing; arrive Kantishna Roadhouse and Bushcamp for lunch; tour of Kantishna by local homesteaders; wildlife tour exiting the park;return to chalets in early evening for dinner and overnight.

July 9. Breakfast and lunch at the chalets; chance to sleep in after long prior day; afternoon Alaska Railroad to Anchorage; dinner and overnight Sheraton Hotel.

July 10. Breakfast at hotel; late morning departure for Potters Marsh birding and on to Portage Glacier; Portage River Float Trip; lunch at the Portage Glacier Lodge; return to Achorage for overnight at the Sheraton.

July 11. Breakfast and lunch on own; morning free for optional activities, shopping, visit to the museum, etc.; afternoon Eagle River Float Trip with dinner and fireworks along the river; overnight Sheraton.

July 12. Breakfast at the hotel; fly Anchorage to St. George Island, with lunch en route; dinner and overnight at St.-George Hotel.

July 13, 14. At St. George rookeries; breakfast and dinner at the hotel; lunch in the field. An evening gathering in the home of one of the Aleut community leaders.

July 15. Breakfast at St. George Hotel; fly St. George to Anchorage, arriving late afternoon; final group dinner and slide show; overnight Sheraton Hotel.

July 16. Breakfast at hotel; fly Anchorage to Chicago.

For further information or to be placed on our mailing list, call or write Dorothy Roder, Tours Manager, Field Museum, Roosevelt Rd. at Lake Shore Dr., Chicago, IL 60605. Phone: 322-8862.

Field Museum of Natural History
Membership Department
Roosevelt Road at Lake Shore Drive
Chicago, IL 60605-2499

Members' Night
Friday, May 16

FIELD MUSEUM OF NATURAL HISTORY BULLETIN

June 1986

Field Museum
of Natural History
Bulletin

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Production Liaison: Pamela Stearns
Staff Photographer: Ron Testa

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June 1986
Volume 57, Number 6

COVER

John James Audubon's "Hooping Crane," plate CCLXI, from The Birds of America. *Audubon mistakenly regarded this bird, now known as the sandhill crane, as the young of the whooping crane, with a distinctive youthful plumage. See pages 7-21.*

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Events

Family Feature

Beetles to Butterflies: A Closer Look
Saturday and Sunday, June 21 and 22
1:00–3:00pm

Beetles that look like solid gold and butterflies that look like leaves! Some insects are among the most beautiful creatures in the animal kingdom. Using microscopes and hand lenses, take a closer look at the insect world. See the scales of a butterfly wing and the pinchers of a predatory beetle. Find out how the Insects Division at Field Museum identifies specimens and stores their collection. Pin and label a Japanese beetle to start your own collection.

Monthly Family Features are free with Museum admission and no tickets are required.

June Weekend Programs

EACH SATURDAY AND SUNDAY you are invited to explore the world of natural history at Field Museum. Free tours, demonstrations, and films related to ongoing exhibits at the Museum are designed for families and adults. Listed below are only a few of the numerous activities each weekend. Check the *Weekend Passport* upon arrival for the complete schedule and program locations. These programs are partially supported by a grant from the Illinois Arts Council.

June

7 12:00 noon. *Treasures from the Totem Forest* (tour). A walk through Museum exhibits introduces the Indians of southeast Alaska and British Columbia, their totem poles and masks.

8 12:30pm. *Traditional China* (tour). Examine the imagery, history, and lifestyles represented by Chinese jades and other masterworks.

14 12:30pm. *Museum Safari* (tour). Seek out big game from Africa and mummies from ancient Egypt as you travel through Field Museum exhibits.

15 12:00 noon. *Chinese Ceramic Traditions* (tour). Explore 6,000 years of Chinese ceramic art.

21 11:30am. *Ancient Egypt* (tour). Explore the traditions of ancient Egypt from everyday life to myths and mummies.

22 12:00 noon. *A Walk with China's Animals* (tour). Meet Su Lin, the panda, and other real and imaginary beasts through Chinese art masterworks.

28 12:30pm. *Museum Safari* (tour). Seek out big game from Africa and mummies from ancient Egypt as you travel through Field Museum exhibits.

29 12:00 noon. *Traditional China—The Jades* (tour). Examine the imagery, history, and lifestyles represented by Chinese jades and other masterworks.

These programs are free with Museum admission and no tickets are required.

Volunteers Do Make a Difference

by Ellen Zebrun
Volunteer Coordinator

THE VOLUNTEER PROGRAM at Field Museum has something to offer everyone because of the wide range of opportunities to serve. The most visible volunteers are those in the Education Department, who help visitors gain greater knowledge and enjoyment from their Museum visits. The Education volunteers share information with school groups as well as the general public through activities such as guided tours, films, puppet shows, and by staffing the Pawnee Earth Lodge and the Place for Wonder.

There are diverse opportunities for volunteers interested in working "behind the scenes." In the scientific areas, some are involved in researching or cataloging collection acquisitions, while others work in the preparation labs or in collection maintenance. The administrative departments also have many volunteers who perform a variety of tasks, including clerical support, editing, research, and even plant care.

Because of the program's scope, the Museum attracts volunteers with a wide range of skills, experience, and education. Some are now or have been college professors or corporation executives; for others this is a first work experience. Some have doctorates, others never finished high school. Some contribute their expertise in highly specialized areas, while others have no such refined skills or have come to learn something different from their previous training. We have young volunteers hoping to add to their resumes as well as those who have retired and are looking to explore outside interests now that they have the time. Most come from Chicago and its suburbs, but some travel from downstate Illinois, from Indiana, and even as far away as southern Wisconsin.

On February 13, Field Museum honored its 1985 volunteers with a special reception in Stanley Field Hall. Willard L. Boyd, president, spoke of the importance of the volunteers to the ongoing success of the Museum and how much their services in the preceding year were appreciated. Irene Spensley and China Oughton were the special honorees that night, each having given 15 years of continuous service.

Mrs. Spensley, an Education volunteer, has given school group tours, developed teaching aids, and has also been actively involved with the Science in Action program and the Summer/Winter Fun Workshops. Mrs. Oughton has been a volunteer in Geology, first working under the late Eugene S. Richardson, curator of fossil invertebrates, and in the past three years with both William D. Turnbull, curator of fossil mammals, and Dorothy L. Eatough, technical assistant in mineralogy/petrology. She has helped with cataloging Mazon Creek fossils, organizing files and the reprint library, and was also involved in many aspects of the recent renovation of the Gem Hall. Dr. Boyd presented these two exceptional volunteers with an honorary award, and also recognized the five volunteers who had given 500 hours or more in 1985.

In 1985, Field Museum volunteers contributed a total of 36,454 hours of service. This is the equivalent of 20.8 full-time paid staff members. Impressive though this figure is, more telling about the program is the length of time the volunteers stay with us. Over 76 percent of the current volunteers have been with Field Museum for more than one year, 54 percent have been here more than three years, and 38 percent have volunteered 5 or more years. Those who have been here for 10 years or more comprise 14 percent of the volunteer force.

Volunteers Who Served 500 Hours or More

Sophie Ann Brunner, Reptiles: prepared skeletons for study and research projects and to extend the division's skeletal collections.

Margaret Martling, Botany: worked with reprint collections and helped process plant collections from Latin America.

David Matusik, Insects: identification and preparation of butterflies and moths for study.

William Roder, Tours: helped with mailings and updating computer listings; has also been Santa Claus at the Women's Board tea the past three years.

Llois Stein, Anthropology: recataloged the 1893 Sudanese Gamelan Orchestra from the World's Columbian Exposition; researched and cataloged collections from Malaysia, Indonesia, Polynesia, Micronesia, Melanesia, and Africa.

400 Hours or More

Ingrid Fauci, Reptiles: translated French to English for staff; assisted in collection maintenance and the Reptile Library.

Lillian Kreitman, Membership: Membership representative; distributed guides to and answered questions from visitors.

Carolyn Moore, Anthropology: researched in Asian collections.

Forman Onderdonk, Education: conducted tours in the animal and Indian halls, Pawnee Earth Lodge and Place for Wonder; assisted with special events; organized files on Maritime Peoples exhibit renovation.

300 Hours or More

Jackie Arnold, Education: weekend clerical assistance; helped staff Place for Wonder; assisted with special events, children's workshops and shadow puppers.

Larry Berman, Fishes: gathered data regarding genetic vs. evolutionary effects on fish characteristics.

Sol Century, Anthropology: cataloging and accessioning artifacts; general projects in Asian Division.

Jeannette DeLaney, Anthropology: Peruvian textile conservation; preparation, analysis and condition reports.

Peter Gayford, Anthropology: cataloged and researched Chinese rubbings from various collections.

Bea Goo, Zoology: helped with clerical work, specimen preparation, and cataloging in both Birds and Fishes divisions.

Joseph Levin, Geology: cataloged specimens for Vertebrate Paleontology collection.

Lucy Lyon, Invertebrates: assisted in cataloging and labeling specimens; organized journals.

Dorothy Oliver, Library: filed new book cards; retrieved books for visitors; assisted in Reading Room.

Gary Ossewarde, Education: researched and conducted weekend tours in Egypt, China, and Maritime Peoples halls; assisted on special events and workshops.

Carol S. Schneider, Botany: scientific illustration of plants, particularly of Euphorbia.

Nicholas Selch, Public Relations: maintained clip files; organized press packets.

David Weiss, Anthropology: administrative assistant in Asian Division.

1985 Volunteers

ANTHROPOLOGY

Dodie Baumgarten
Linda Bedard
Jennifer Blitz
Cynthia Borowy
Charles Braner
James E. Burd
Louva Calhoun
Sol Century
Trace Clark-Petravick
Connie Crane
Jeannette DeLaney
Patricia Dodson
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Peter Gayford
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Philip Pinsof
Lolita Rogers
Beth Scheckman
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Matthew Stec
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Cathy Tlapa
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Greg Guliuzza
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Jeanne Martineau
Selwyn Mather
David Matusik
Larry Misialek
Lorain Olsen
Charles Plasil
Sheila Reynolds
Diana Rudaitis
Kurt Schenk
Sheila Seyboldt
Paul Thomas
David Walker
Maxine Walter
Harold Waterman
Mary Wenzel

Field Briefs

Priscilla F. Turnbull 1924-1985

Priscilla Turnbull, a research associate in Geology and former Field Museum staff member, died Dec. 6, 1985. A life-long resident of Chicago or of its suburb Park Forest, she obtained her bachelor's and master's degrees in geology and paleontology at the University of Chicago. She served as a scientific assistant from 1946 to 1954 and was a Field Museum research associate in Geology from 1974 to 1985.

In 1946 at the Museum she met William D. Turnbull, now curator of fossil mammals, and they were married in 1948. For most of their married life they did fieldwork together in the Cenozoic of Wyoming and Australia, although Priscilla's first publication (1955, co-authored with her husband), was on the anatomy of *Phlegethontia*, an amphibian from the Pennsylvanian of Illinois.

Priscilla also collected with Rainer Zangerl (now curator emeritus of Geology) in the Mesozoic of Wyoming (1948) and with the late Robert Denison, former curator of fossil fishes, in the Devonian of Utah and Montana (1949-1950), and she was the faunal analyst on a 1974 American Museum of Natural History expedition which excavated a Bronze Age site in Pakistan. Her field experiences, thus, were widely varied as to time and area.

Beginning in 1961, Priscilla specialized in the study of the nonhuman bones excavated from prehistoric archaeological sites in the late Quaternary of Mauritania, Egypt, Jordan, Iraq, Iran, and Pakistan, and all of her publications thereafter (ten published, two in press, and one finished and two unfinished manuscripts) are related to those studies. She had the unusual distinction of having published articles in three of the Field Museum's four scientific series (Anthropology, Geology, and Zoology) as well as in the *Bulletin*. Most of Priscilla's studies were on collections shipped to her; the only site at which she herself excavated the faunal remains was that of Allahdino, Pakistan. However, during those years of work on osteoarchaeological collections, she was also rearing a son, participating in her husband's fieldwork in Australia and Wyoming, and was active in civic work in Park Forest, where the Turnbulls lived for most of their married life.

Priscilla was a meticulous worker, as I know from having shared laboratory research with her; she never recorded an identification of a broken piece of bone until she was absolutely certain of its validity. She was a small lady, perky, industrious, and thoughtful. She is sorely missed by all who knew her.—*Charles A. Reed, Research Associate, Department of Zoology*

Richard M. Jones New Board Chairman

Richard M. Jones, president and chief financial officer of Sears Roebuck and Company, has been elected chairman of Field Museum's Board of Trustees for a two-year term. He succeeds James J. O'Connor, who had served as Board chairman since January 1982. Jones joined the Board of Trustees in 1981. In addition to his new position on the Board, he is serving as chairman of the Museum's Capital Campaign.

The recent Board elections installed the following officers also: Robert A. Pritzker, president and chairman of the Marmon Group, was elected chairman of the Board's Collections and Research Committee; Marshall Field, chairman of the board for the Field Corporation, became chairman of the Public Programs Committee; Blaine J. Yarrington, former executive vice president (retired) of Standard Oil of Indiana, was elected chairman of the Finance and Museum Services Committee.

Newly elected trustees include Mrs. Phillip D. Block III; Robert D. Cadieux, president and director of Amoco Chemicals Corporation; Worley H. Clark, Jr., president and chief executive officer of Nalco Chemical Company; Thomas J. Eyerman, partner, Skidmore, Owings & Merrill; Ronald J. Gidwitz, president, Helene Curtis Industries; Clarence E. Johnson, president of Borg-Warner Corporation; and John J. Kinsella, chairman, Leo Burnett-USA.

New Women's Board Officers

The new president of Field Museum's Women's Board is Muriel (Mrs. Malcolm N.) Smith, elected at the Board's annual meeting, May 13. Mrs. Smith succeeds Mrs. Philip D. Block III, elected in 1984, and becomes ex officio member of the Board of Trustees. Other new officers elected at the May meeting were three vice presidents: Mrs. Michael N. Bilandic, Mrs. Edward Hines, and Mrs. Edward Byron Smith, Jr.

Mrs. John W. Taylor III was elected recording secretary, Mrs. Frank W. Blatchford III was elected corresponding secretary, and Mrs. Walter L. Cherry was elected treasurer. Also elected were three members-at-large: Mrs. Robert Lane Cruikshank, Mrs. Gerald S. Gidwitz, and Mrs. David W. Grainger.

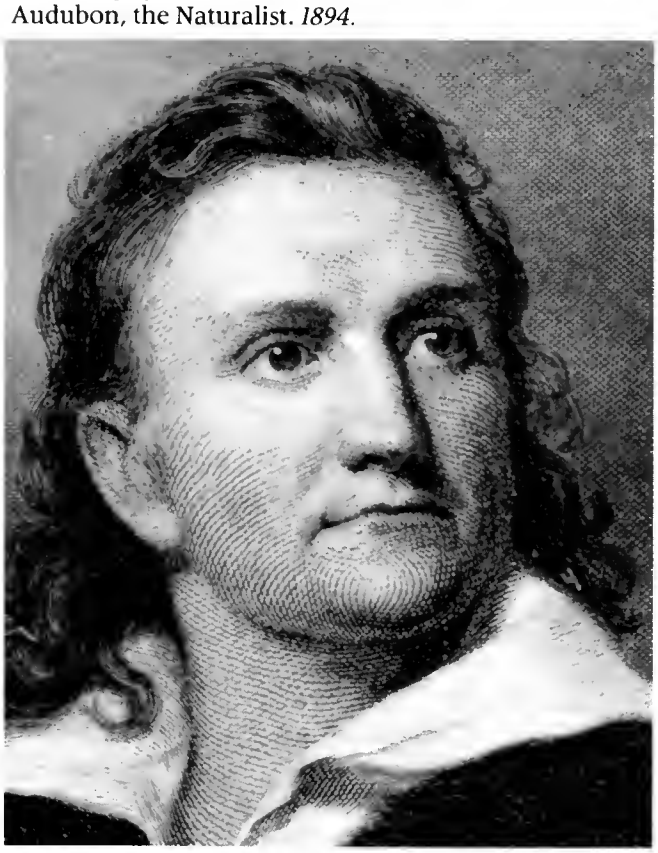
The Board's new president, a member of that body since 1976, was also recently honored by the National Society of Fund Raising Executives. That group, consisting of professional fund raisers in the U.S. and Canada, named Mrs. Smith "Outstanding Volunteer Fund-Raiser of the Year" for 1986. Well known for her involvement in Chicago community projects since 1957, Mrs. Smith is also chairman of the board of trustees of the Erikson Institute; president of the Taylor Institute; heads the Development Committee of Michael Reese Hospital and Medical Center; and is trustee of numerous social welfare, educational and arts organizations. She plays an active role in the United Way, recruiting board members from the Chicago corporate community.

Audubon's "The Birds of America"

and the remarkable history of field museum's copy

by Benjamin W. Williams
Associate Librarian and Librarian, Special Collections

Engraving of Audubon. From The Life of John James Audubon, the Naturalist. *1894.*



John James Audubon's *The Birds of America* (published in London, 1827-1838) is the most famous and most magnificent of all the great hand-colored bird books. Field Museum Library received its copy* of the Audubon folio in 1969 as the gift of Mary W. Runnells, and since 1970 on a rotating basis, one of the four volumes of the set is always on public display in the Museum's North Lounge. Since 1981, the volumes not on display have been housed in the Library's Mary W. Runnells Rare Book Room, construction of which was made possible by Trustee and Mrs. John S. Runnells, whose continued support of the Rare Book Room has further enhanced the significant collections housed there.

The Library's set is one of the finest copies of *The Birds of America* in existence, with the binding and paper in an excellent state of preservation and the plates colored with a care and richness that few other copies can match. Certain other characteristics of Field Museum's copy make it even more exceptional and link

*The terms "copy," "set," and "folio" are used interchangeably to mean a complete, usually bound, example of *The Birds of America*, including at least the normal 435 plates.

it directly with Audubon's own copy of *The Birds of America*, which is held by the H.J. Lutcher Stark Foundation in Orange, Texas: both of these sets have the plates bound up in order by species rather than in the normal plate number order, and both contain 13 extra plates not present in other copies. The species order of the plates in both these copies is based on the systematic grouping of birds Audubon adopted in *A Synopsis of the Birds of North America* (Edinburgh, 1839), written and published after completion of *The Birds of America*. The 13 extra plates were specially prepared in 1838 for inclusion in this systematic arrangement and both copies were subsequently bound up in 1839. These distinctive characteristics shared by the two sets are part of an untold story of one of the most interesting chapters in the history of Audubon's production of *The Birds of America*.

Unfortunately this story has been obscured by an erroneous history of Field Museum's copy of the folio that gained wide currency after publication of Waldemar Fries's *The Double Elephant Folio*.[1] Fries believed he had traced the set to the original ownership of Euphemia Gifford, cousin of Audubon's wife, Lucy. The physical evidence from the Field Museum copy, however, directly contradicts this notion and the documentary evidence on which it is based.

The Double Elephant Folio presents the results of Fries's many years of travel and research in an attempt to find and examine every extant copy of *The Birds of America*. His study is indeed a useful compilation of information on the location and condition of some 135 surviving copies of the folio and Fries merits the respect he has received for this pioneering fieldwork. But many of Fries's attempts to trace the history of particular copies of *The Birds of America* need to be carefully reexamined. His conclusions about Field Museum's copy in particular provide a clear case of the errors that result whenever studies of provenance wander too far from the physical bibliographic evidence at hand.

The point of departure in this study of Field Museum's copy of the Audubon folio was the evident contradiction between bibliographic fact and the conclusions presented by Fries. The pursuit of a correct explanation for the evidence led back through the trail of documentary evidence cited by Fries to the discovery that Audubon's and Field Museum's sets are two of three special copies of *The Birds of America* that were prepared under Audubon's directions for himself, his American friend Edward Harris, and his British friend Dr. Benjamin Phillips. The Harris copy seems no longer traceable, but all the evidence suggests that it is the Phillips copy that now resides at Field Museum. Retracing the route that led to this conclusion will involve first disposing of the erroneous "Gifford provenance" and then relating the story of the thirteen extra plates and the origin of these two distinctive copies of *The Birds of America*.

Although there are a great many well-informed Audubon collectors and enthusiasts, and public awareness of Audubon's work is widespread, a description of the manner in which most copies of *The Birds of America* were produced and distributed will, nonetheless, provide a useful background for the discussion of the Museum's special copy.

Audubon's plan for *The Birds of America* was impressive in scope: to depict all the birds of America in life-size images on 400 hand-colored, copperplate engravings to be offered to purchasers on a subscription basis. Each subscriber was to receive the prints in parts or "numbers," of five plates each. On each print the part and plate numbers appear at the top: "No 1" is engraved at the upper left corner of the first five prints, and the consecutive plate numbers are engraved at the upper right, from "PLATE I" to "PLATE V" (Roman numerals were used for plate numbers, Arabic for part numbers). Subscribers were to receive 80 of these numbers and along with every twentieth number would come an engraved title page to be used in binding the plates into four volumes of 100 plates each. As the work was drawing toward its conclusion in 1838, however, so many new birds were being discovered that Audubon was forced to go well beyond the planned 400 plates. Ultimately, subscribers received a total of 87 numbers, or 435 plates.

The five plates included in each of the numbers were carefully selected to present an appealing variety of images to subscribers as they received each new installment. The principal distinction in appearance among the plates is related to the size of the birds depicted. The illustrations of the larger birds fill all or most of the sheet while those of the smaller birds often have wide margins around a small pictorial area. By including plates of large, small, and medium-sized birds in each number Audubon secured a broader appeal for his plates as he canvassed for new subscribers. This was a shrewd marketing strategy, but resulted in a random order of the birds in the final bound volumes.

The original paintings that are reproduced in *The Birds of America* were often the result of a collaborative effort. Audubon himself painted the vast majority of the

Composite Plate CCCLIV (354). The figure at left center, a female Louisiana tanager, has been added from plate CCCC (400).

The "ottoman" in which Field Museum's copy of The Birds of America *was stored. Inside are four drawers designed to completely encase and protect the four volumes of the set.* 81919

bird figures that appear in his plates, but a few were painted by his son John and by some of the artists who assisted him. Many of the habitat backgrounds, landscapes, and plants were painted by these assistants, either directly on Audubon's paintings of the birds or sometimes separately. Backgrounds painted separately in this manner were supplied along with the bird paintings to the engraver, who combined them in accordance with Audubon's instructions to produce the finished printed plate. The copperplates were executed primarily through a combination of etching and aquatint.

Audubon found the search for an engraver difficult at first. In 1826, having failed to find one in America, Audubon engaged the services of the Scottish engraver Lizars, in Edinburgh. Lizars engraved and colored the first two numbers, or ten plates, of *The Birds of America* but Audubon was not satisfied with Lizars' work. By the following year, and to his great good fortune, Audubon had arranged for the engraving and coloring of his plates by the London firm of Robert Havell. Robert Havell, Jr. lived up to Audubon's vision in his translation of the artist's original paintings into the hand-colored engravings so familiar today.

The paper used, both for Audubon's original paintings and for the prints produced by Havell, was made by the British firm of J. Whatman. Since he had set himself the goal of depicting birds life-size, Audubon found that he required one of the largest sheet sizes of paper then manufactured, measuring 29½ by 39½ inches untrimmed, a size called double elephant folio. The watermark in Whatman paper is extremely important in the study of *The Birds of America* since it bears the year in which each sheet of paper was made. Paper from at least two of Whatman's paper mills was used for Audubon's prints. The watermark on each sheet appears parallel to the longer dimension of the paper and toward the corner of the sheet. For example, many copies of the first few prints produced by Havell bear the watermark:

J WHATMAN
1827

or:

J WHATMAN
TURKEY MILL
1827

These watermarks, in conjunction with the dates of

engraving of the copperplates (known from Audubon's and Havell's records, but also engraved on most of the plates), are extremely useful in determining the history of some copies of the folio.

The complete sets of those who subscribed to the work at or near the beginning of publication contain prints with watermarks that closely parallel the dates of engraving of the copperplates. In such sets, prints from copperplates engraved, for example, in 1830, will generally have watermarks dated 1830. The costs of producing a work such as *The Birds of America* were great, and Audubon and Havell could not afford to produce more copies of the prints than were needed to supply the subscribers on their list at any given time. From time to time, however, throughout the twelve years of publication, Audubon and his friends and supporters found new subscribers to the work. For these later subscribers a set of those prints that had already been published was newly printed off and colored. The copy of *The Birds of America* originally belonging to an owner who began his subscription in 1834, for example, after most of the first 200 prints had been issued, would be characterized by watermarks of 1834 or later years on most of those first 200 prints.

Many subscribers received their plates loose in the numbers of five plates as these were issued, and were responsible for having their own volumes bound. For some subscribers Audubon had the volumes bound by the London binder Hering. One such subscriber was Euphemia Gifford.

Fries was originally led to the idea of the Gifford provenance by a single piece of information: the "ottoman" in which the Field Museum set of *The Birds of America* was housed. This piece of furniture was specially built to house the four volumes of the folio. It is a rectangular case containing four drawers for the four volumes of the copy, each of which pulls out and opens up for viewing the plates. Fries was aware of a single reference to such a piece of furniture in one of Audubon's ledgers, indicating that Euphemia Gifford had received an "ottoman" for her copy of the folio. It was solely on the basis of this fact that Fries assumed that the Field Museum copy and the original Gifford subscription copy were the same. Bibliographic evidence from the Field Museum copy and documentary evidence

The "ottoman" with one of the four drawers pulled out and opened. Each volume was not only protectively housed within its drawer, but could be viewed in place and with minimal handling, accounting for the excellent state of preservation of the set. 81920

At left is the normal version of plate CCCLXIX (396), the mountain mocking bird and the varied thrush. Below is one of the late, crowded plates illustrating several species, among them (at lower left) another example of the varied thrush. This figure of the thrush was added to the normal plate by overprinting it in the lower right corner of the image, producing the composite version shown at the right. Note the manner in which the branches have been redrawn by hand on the composite in an attempt to unite the entire composition.

1 & 2 *Mountain Mocking bird. Male*
ORPHEUS MONTANUS. *Townsend*

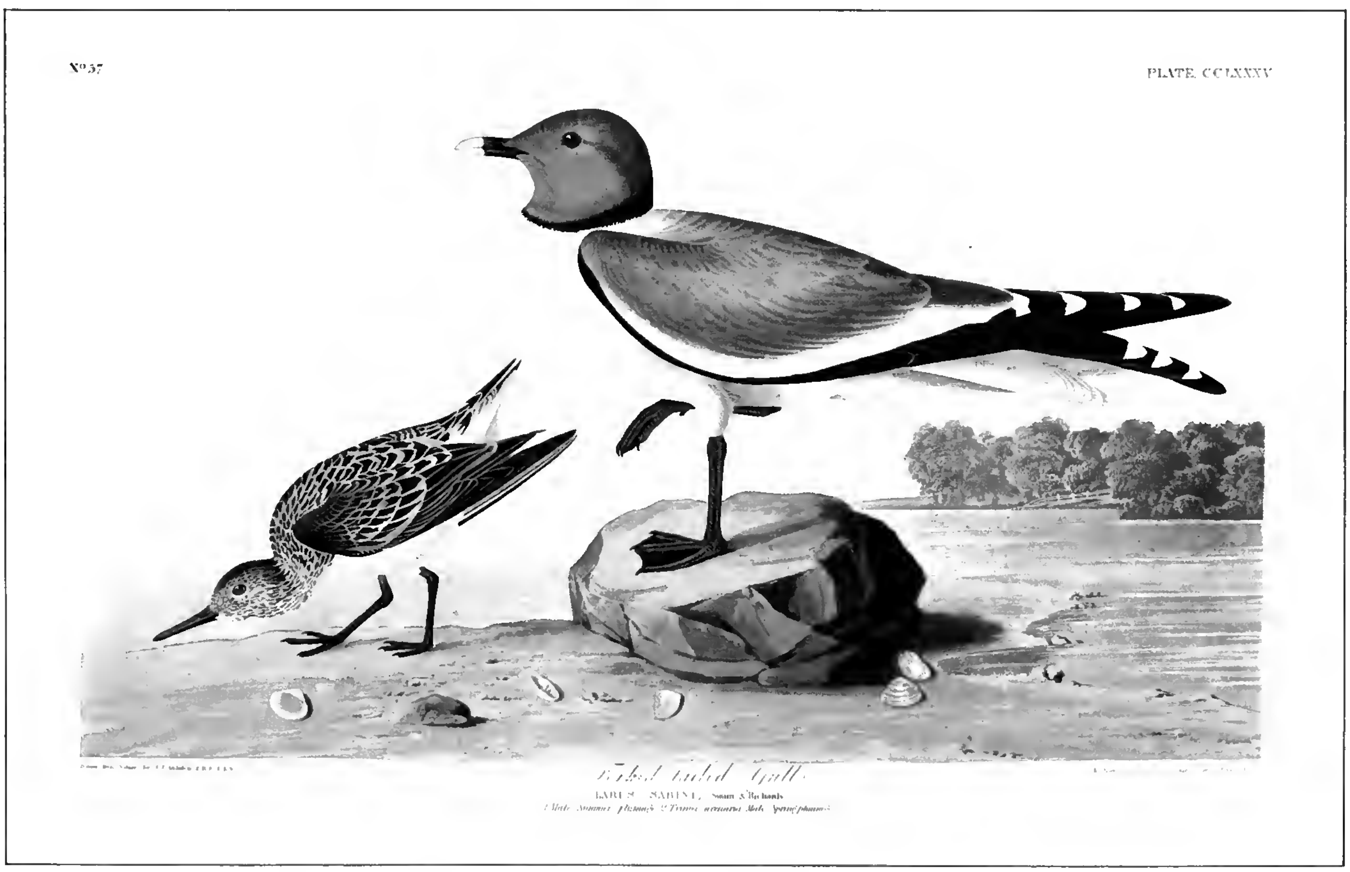
3 & 4 *Varied Thrush. Male & Female*
TURDUS NAEVIUS. *Gm*

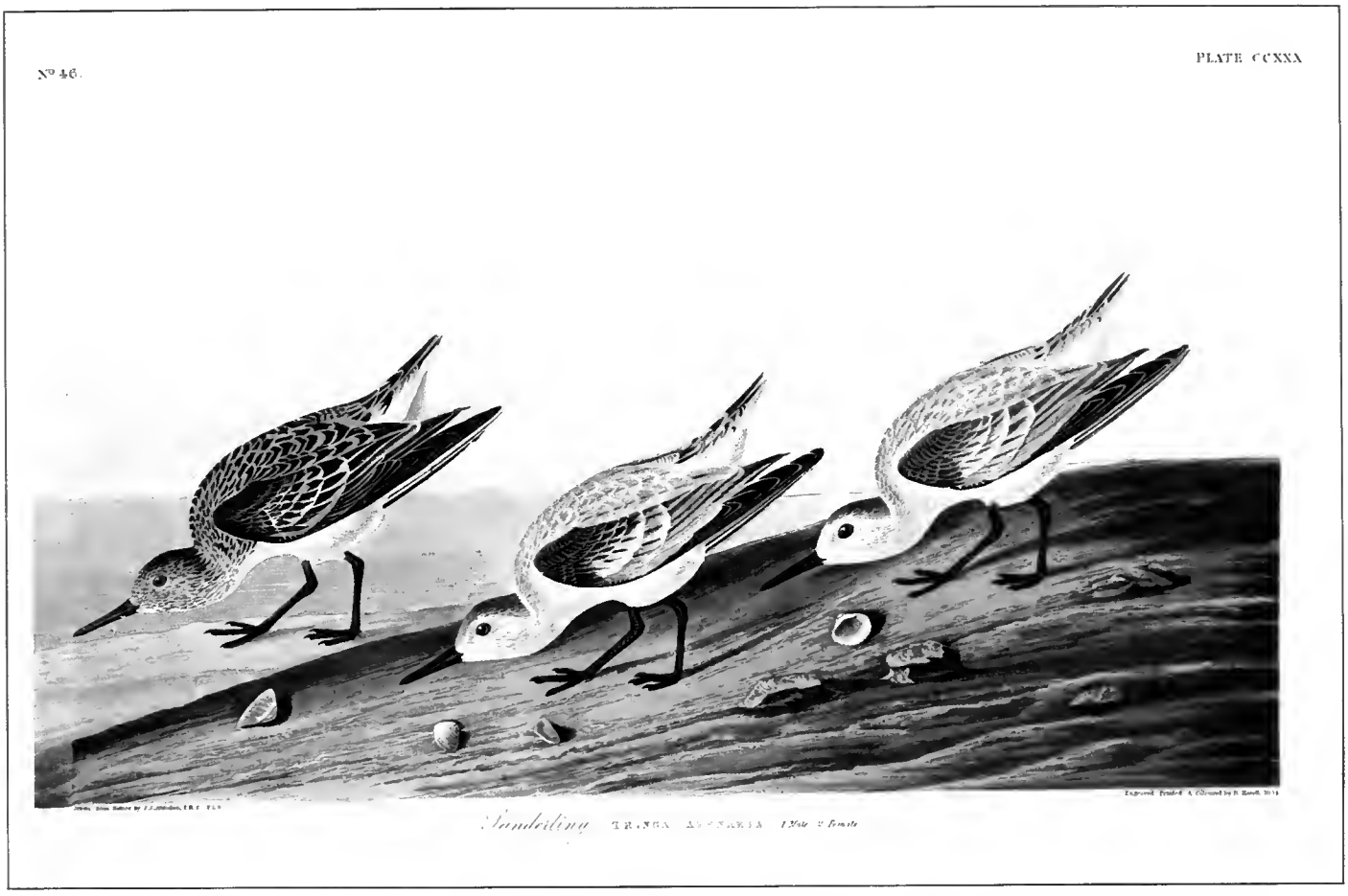
Drawn from Nature by J. J. Audubon F.R.S. F.L.S.

Plant Menziesia
Ovum Verticillatum

Engraved, Printed and Coloured by R. Havell Jun.


No 46
PLATE CCXXX
Sanderling TRINGA ARENARIA. 1 Male 2 Female


No 57
PLATE CCLXXXV
Fork-tailed Gull.
LARUS SABINI, Swain & Richards



(Above) The composite version of plate CCXXX (230), the sanderling (or ruddy plover). Added to the normal version of this plate (opposite, above) is a figure of a male in spring plumage, taken from plate CCLXXXV (285) (opposite, below). In his comments on plate 230 in his Ornithological Biography *(vol. III, p. 232) Audubon mentioned the oversight by which this figure of the sanderling was separated from the two on plate 230: "The figure of a fine male, which, being on another sheet of paper, was overlooked... you will find in Plate CCLXXXV...." The composition unites these three figures as originally intended. Note the considerable changes to the background, particularly at the left.*

relating to the Gifford copy, however, are completely contradictory.

There is abundant evidence, some of it quoted by Fries, that Gifford received each volume of her set bound up in normal plate number order as it was completed. In a letter of 29 June 1831 Audubon writes Gifford: "I have the pleasure to send you the first volume of my work bound as near according to your own directions as either Lucy or myself can conceive."[2] Volume 1, completed in 1830, contained plates 1-100; plates 1-100 in Field Museum's copy are located in three different volumes due to the arrangement by species rather than plate number. A letter of 27 July 1834 indicates shipment of

Beginning Monday, June 30 each of the 13 composite plates in Field Museum's copy of *The Birds of America* will be displayed for one week in the North Lounge (third floor), where the Audubon display case is located. The plate on display will be changed each Monday morning through the last full week of September.

The great white heron, plate CCLXXXI (281), one of Audubon's most dramatic images. The great white is now regarded as a variant form of the great blue heron. In the background is a view of Key West.

Gifford's volume 2[3] (plates 101-200, completed 1834); and a letter of 26 September 1838 from Victor Audubon, the artist's son, to the engraver Havell, requests Havell to expedite delivery to Gifford and other English subscribers receiving bound copies of volume 4[4] (plates 301-435, completed June, 1838). The Gifford copy then was bound up in the normal fashion:

Vol. 1	plates 1-100	1827-1830
Vol. 2	plates 101-200	1831-1834
Vol. 3	plates 201-300	1834-1835
Vol. 4	plates 301-435	1836-1838

There is only one way such a copy of the folio could end up in species order like the Field Museum copy: the four volumes would have to be taken apart, the plates rearranged in species order and the whole bound up anew. Clearly ruling out the possibility that the Field Museum set is a rebound Gifford copy is the evidence of the watermarks.

Even if the Field Museum copy were bound up in normal plate number order it could still be easily distinguished from the Gifford subscription copy by the fact that most of its plates were printed and colored much later than those in the Gifford copy. Gifford's copy of volume 1, for example, bound up by Audubon and sent to her in mid-1831, could not possibly contain plates printed on paper with watermarks dated later than 1831. Of the same plates in the Field Museum copy (*i.e.*, plates 1-100) one bears the watermark 1830, one shows 1838, and 98 plates have the watermark 1833. When Gifford received her copy of volume 1 in 1831, 99 of the same plates in the Field Museum copy had not even been printed. The same is true of the bulk of the plates for volumes 2 and 3 (plates 101-300). Most copies of the folio will have similar dates for the final volume of plates (plates 301-435), since few new subscriptions were obtained during the final period of publication and printing proceeded in a fairly regular manner. The following table summarizes the watermark data from the Field Museum copy. Again, in a copy such as Gifford's which was subscribed for at an early stage in the publication of the work, the watermark dates will closely parallel the dates of engraving of the copperplates.

Watermark Dates

Date Engraved	Field Museum Copy	
	Watermark Dates	Number of Plates with Watermark
Volume 1	1830	1
Plates 1-100	1833	98
1826-1830	1838	1
Volume 2	1834	1
Plates 101-200	1836	63
1831-1834	1837	7
	1838	29
Volume 3	1834	1
Plates 201-300	1836	17
1834-1836	1837	2
	1838	78
	uncertain	2
Volume 4	1836	50
Plates 301-435	1837	60
1836-1838	1838	25

Total Watermarked Plates Each Year:

1830: 1	1836: 130
1833: 98	1837: 69
1834: 2	1838: 133

All but 20 of the first 300 plates in the Field Museum copy were printed years after the same plates in the Gifford copy. In addition, the order in which the prints were pulled and colored is often quite erratic. The five prints of number 32, for example, show the following variation in watermark dates, although the copperplates were all engraved in 1833:

Plate Number	Watermark Date
156	1836
157	1834
158	1838
159	1837
160	1838

Watermarks in the Field Museum set also establish the earliest date at which the set could have been bound up. The endleaves of all four volumes of the set bear watermarks of either 1838 or 1839. In all likelihood the set was bound up in 1839, and perhaps before the Audubons and Havells departed from England for America in August of that year.

All this bibliographic evidence clearly rules out the possibility that Field Museum's copy of *The Birds of America* is the copy originally owned by Euphemia Gifford. If Gifford's copy is still in existence it, too, may be incorrectly identified in Fries's study or it may be one of the many copies whose history Fries was unable to trace. While one might hope that Fries's erroneous description of Field Museum's copy is an isolated case in *The Double Elephant Folio*, his handling of the evidence relating to this copy raises doubts about the reliability of his work as a whole.

Part of Fries's description of the Stark Foundation (Audubon's) copy could be applied verbatim to Field Museum's copy:

> The 435 prints with an additional 13 . . . have been arranged systematically (instead of numerically) according to Audobon's *Synopsis of the Birds of North America.* Thus the first print in Volume 1 is not the Turkey but the California Turkey-vulture, plate number 426.[5]

Fries mentions the presence of the 13 extra plates in the Field Museum copy but does not describe the copy as bound in systematic order, something he was well aware of since he visited the Museum to examine the copy in 1970. A generous interpretation of this omission would be to regard it as an oversight. Fries was committed to the "Gifford provenance," solely on the basis of the "ottoman," and quotes the correspondence (referred to above) that verifies Gifford's receipt of a regular subscriber's copy. Such a copy could not be bound up in systematic order, as has been shown.

More troubling is an exceedingly awkward misinterpretation of a source document in Fries's attempt to make Gifford into one of the recipients of the 13 extra plates. He writes:

> On 28 August 1838 Victor Audubon wrote the engraver Havell that he wished "6 copies printed of those plates which have old or young birds to add on them or females&c." There is evidence that Miss Gifford received one of these sets.105[6]

In fact, there is no such evidence in the document he cites. Gifford is not even mentioned in the letter of 28 August 1838, nor does any other source link Gifford to the extra plates. Perhaps Fries had in mind the following letter of 26 September 1838, also from Victor Audubon to Havell, which happens to mention both Gifford and the extra plates:

> We are all quite well, and are pushing the printing here [of the fifth volume of Audubon's *Ornithological Biography,* published in Edinburgh] as fast as we can—Please send Mrs. Gifford's, Mr. Young's & all other *4th* vols. [of *The Birds of America*] for the *English delivery* as soon as ready, to their respective destinations. When you write let us hear how you are getting on with every thing and if you have yet any idea of when the 15 setts will be ready [these copies of the folio were to be sold in America]. The additional birds you will please print so as to make in all 6 setts of these particular plates extra if you find

they look well. They are to be *extra plates only,* so that you need not use any but the coppers on which they are, and we will keep them for ourselves, Mr. Phillips, & Mr. Harris.[7]

The mention of Gifford simply confirms preparation of her regular subscriber's copy of volume 4. Not only does this letter not identify Gifford as a recipient of the extra plates, it states precisely who was to receive them.

It seems that Audubon could hardly have found two more deserving friends than Harris and Phillips, each in his own way a companion and supporter of Audubon's immense undertaking. Each had his own pursuits in natural history and it is not surprising that these friendships should have resulted in special copies of *The Birds of America.*

Edward Harris of Moorestown, New Jersey, accompanied Audubon more than once on his travels in the American wilderness in search of birds. Harris seems to have been readily susceptible to Audubon's expansive enthusiasm, characteristically expressed in a letter of 1833, urging Harris to join him in his travels:

> Make up your mind, pack up your effects, shoulder your flintlock and away to the Fields where Science awaits us with ample stores the contents of which are the rarest materials ever employed by Nature.[8]

Harris helped Audubon and his family in many ways and on many occasions, and was particularly effective in securing the numerous bird skins Audubon needed for his studies and illustrations. All this help was proffered in such an unassuming manner that Audubon was prompted at one point to counsel Harris: "You are sadly too modest my worthy friend. Indeed you are so modest that you have more than once almost vexed me on that head."[9]

Dr. Benjamin Phillips, a physician, zoologist, and member of the Royal Society, lived near the Audubons' London residence on Wimpole Street. Like Harris, his assistance to Audubon and his family seems to have been continuous and ungrudging. Frequent references to Phillips in Audubon's correspondence with others make it clear that the doctor reliably performed many services in forwarding Audubon's work in London. Audubon was well aware of the gratitude he owed to Phillips:

> Were I to mention the many occasions on which he has aided me by his advice and superior knowledge of the world, you would be pleased to find so much disinterestedness in human nature. His professional aid too, valuable as it has proved to us, and productive of much inconvenience to him, has been rendered without reward, for I could never succeed in inducing him to consider us his patients, although for upwards of two years he never passed a day without seeing my wife.[10]

Phillips successfully brought Henry Havell, the engraver's brother, through a serious bout with influenza and offered sound medical advice to other friends of the Audubons' circle.

Little correspondence between Audubon and Phillips is available, and no documentary evidence has come to light, other than that cited here, directly describing Phillips's copy of *The Birds of America.* Phillips's own accounts and views would be a welcome addition to the story of the special copies of the folio Audubon and his two friends prepared for themselves. We should proceed by examining their plan of arranging Audubon's plates in systematic order, from which arose the idea for the 13 extra plates.

Since binding the plates in number order results in an unsystematic arrangement of the birds, it was clear from the start that a species index to the entire work would make it far more useful to naturalists. As Audubon's ornithological knowledge increased he began to plan a complete systematic list of American birds that would serve as such an index. As publication of *The Birds of America* was drawing to a close in 1838, Audubon turned his attention to the list and, with the aid of the Scottish naturalist William MacGillivray, it was finally published in June 1839 as the *Synopsis of the Birds of North America,* in one small octavo volume. By binding up their plates in *Synopsis* order, Audubon and his two friends gave themselves the significant advantage of parallel text and plates; they could leaf simultaneously through the two works without having to jump from one to another of the mammoth volumes of *The Birds of America.*

The story of Edward Harris's copy of *The Birds of America* is readily available in Audubon's correspondence, yet not a word of it appears in Fries's study. In numerous letters written to Harris between June 1834 and June 1836, Audubon kept Harris informed of the preparation of his copy of the folio, described its binding (done by Hering) as half leather with two locks, and specifically mentioned the shipment of Harris's copies of volumes 2 and 3.[11] Then on 18 August 1837 he wrote Harris:

> I will await your order with anxiety as regards your new entire Copy, wishing to know from you whether or not Mr. Berthoud [a relation by marriage who acted as one of Audubon's business agents in America] has disposed of the 3 Vols. you have with locks to a gentleman of Lond.

The Louisiana heron, plate CCXVII (217). Although the background (by George Lehman, one of Audubon's assistants) may be somewhat fanciful as a representation of the Florida Keys, the engraving and coloring of the bird show the engraver Havell at his best.

> England—At all events we have a fine sett of all that is published for you. . . .[12]

On 18 November there followed the note to Harris: "I will leave your Copy of my Work unbound until you come. . . ."[13]

It was evidently at some time between the shipment of Harris's volume 3 in June 1836 and the letter concerning his "new entire Copy" in August 1837, that Audubon, Harris, and Phillips hatched the plan of binding up their copies of *The Birds of America* in *Synopsis* order. Confirmation of their plan comes from Audubon's letter to Harris on 7 July 1839:

> My Dear Friend,
> You will along with this receive a copy of my Synopsis of our Birds which I hope will please you, and answer your purpose, not only in the arranging your plates of the Birds of America, but also in here after detecting whatever New species may be discovered in our country; and which no doubt will amount to a goodly number in a score of years.[14]

Available documentary sources offer little detailed information about Phillips's receipt of the plates for his copy and no evidence that, like Harris, he first received bound volumes which were later replaced by a new set of loose prints. He seemed instead to have received only loose plates. One of Audubon's business ledgers lists Phillips's payment for "Vols. 1,2,3 (unbound).[15] There can be little doubt that Phillips, too, received his copy of the *Synopsis* and he, like Harris, probably chose to arrange his own plates in systematic order. This is all the more likely since the arrangement of the plates in the Field Museum copy departs at several points from the

arrangement found in the *Synopsis:* Dr. Phillips apparently had a few ideas of his own about ornithological systematics.

The extra, or "composite," plates, as Fries appropriately calls them, were a natural outcome of the plan to bind all the plates of *The Birds of America* in systematic order. The composites serve as a corrective for a number of discrepancies that had accumulated over the 12 years of publication. Audubon had sought, in depicting all known species of American birds, to provide illustrations of the male, female, and young of each. For the larger birds this could not be accomplished in a single life-size illustration, but for smaller species all three figures could be easily accommodated on a single plate. In 13 instances, however, one or another of the required figures had been separated from its companion pieces and engraved on a different copperplate. Unable sometimes to find all three specimens (of male, female, and young) in time to meet his self-imposed deadlines, Audubon was forced by the pressures of publication to let Havell engrave the figures he had available, and add the other figures to later copperplates whenever he managed to find and draw them. In a few plates Audubon had incorrectly identified the figures; and in the case of plate 230 Havell had simply misplaced Audubon's drawing of one of the figures, and engraved it later on plate 285 when the mistake was noticed.

The purpose of the composites was to reunite these separated figures on single plates which Audubon, Harris, and Phillips could insert in their systematically arranged copies, creating what could rightly be called "ideal" copies of *The Birds of America.* No reengraving of the copperplates was done. Each composite was prepared by printing the necessary portions of two or—for two of the composites—three copperplates on a single sheet of paper. Each composite print went through Havell's press at least twice, the first time to print an entire plate with appropriate areas left blank, the second (and third) time

The Florida cormorant (or double-crested cormorant), plate CCLII (252). This southern form of the double-crested cormorant is no longer regarded as a species separate from the northern form.

to print in those blank areas the bird figures required from other copperplates. (See illustrations pages 12-13 and 14-15.) To complete the print Havell then did any necessary drawing by hand on each of the prints to bring portions of background or foliage together into a single composition. The coloring of the plates helped to smooth somewhat the rather rough appearance of the composites. The figures added to the composites are not identified in the legends since only the legends of the initial copperplates and not those of the second and third appear on each of the composites.

Audubon needed only three copies of each of the composites for himself and his two friends but instructed Havell to prepare six copies, probably because he was uncertain just what these special plates would look like. Audubon was not in London at the time Havell was preparing the composites, so he was unable to supervise the job. It probably seemed wise to have six copies of each composite from which to select the best three for himself, Harris, and Phillips. The other three copies of each composite were apparently put back in Havell's stock of remaining plates and were used as normal plates in making up bound copies of the complete work to be sold in America. Other copies of *The Birds of America* are known to include one or more—but not all 13—of the composites in place of the normal plates, and one loose composite is known to be in private hands. The remaining copies of the composites are still undiscovered and may be included in yet other bound volumes or they may survive as loose plates. There may well be collectors of Audubon plates who are unaware that they own one of these rare composites.

It is unfortunate that Edward Harris's copy of *The Birds of America* seems to have disappeared. It is fairly certain that his copy was sent to him as a set of loose plates. Audubon wrote him on 18 March 1839:

> I will write to Havell to keep your Copy of the Work unbound, and I am glad to hear that we have in America *persons* who can do such things as binding books as well as in London for one half the price charged in the latter place.[16]

Harris apparently intended to have his copy bound up in this country, but there is no confirmation that he ever did so. Information supplied to Fries by one of Harris's descendants confirms that many loose plates are owned by numerous family members, strongly suggesting that the copy was never bound up.[17] That Harris's library was dispersed, at least in part, is indicated by the presence in Field Museum's Rare Book Collection of his autographed copy of the earliest illustrated bird book: Pierre Belon's *L'historie de la nature des oyseaux* (Paris, 1555). For now, the fate of his copy of *The Birds of America* is simply unknown.

The history of the Phillips copy was a more fortunate one. Whether the idea of the "ottoman" originated with Audubon, Gifford, Phillips, or someone else, Phillips had such a cabinet built for his set of the folio. The excellent state of preservation of his copy is largely the result of this protective housing. It appears that eight years after Phillips's death in 1862 some or all of his library was sold in London, including his copy of the folio. A brief notice of that sale in an American journal in 1870 made no mention of extra plates or systematic arrangement of the plates, and mistakenly identified the copy as Audubon's own, but the distinctive ottoman is described in detail. The set was apparently purchased at that time by the Baroness Burdett-Coutts and, in turn, sold to J.W. Dearden at an auction of the Baroness's library in London in 1922. It next passed to the Chicago rare book dealer Kenneth Nebenzahl at a Sotheby's, London, auction in 1969, and from him to Mary W. Runnells, who donated the set to Field Museum. In light of what is now known the set should rightly be referred to as the Phillips copy and take its place along with Audubon's copy as one of the two premier sets of *The Birds of America.* **FM**

ACKNOWLEDGMENT

I would like to thank Ms Anna Jean Caffey and Ms Vicki L. Heltunen of the H.J. Lutcher Stark Museum, Orange, Texas, for their hospitality and patience during my visit to examine Audubon's copy of *The Birds of America;* and a special thanks for unremitting assistance of many kinds to Mr. Scott MacKenzie, Audubon enthusiast and friend and correspondent of Waldemar Fries.—*B.W.W.*

NOTES

1. Chicago; American Library Association, 1973
2. H.J. Lutcher Stark Foundation, Audubon-Bakewell Correspondence, Letter No. 2
3. Audubon-Bakewell Correspondence, Letter No. 4
4. Houghton Library, Harvard University, bMS Am 1482, No. 245
5. Fries, p. 307
6. Fries, p. 259
7. Houghton Library bMS Am 1482, No. 245
8. Houghton Library, pfMS Am 21, No. 8 (7 May 1833)
9. Houghton Library, pfMS Am 21, No. 21b (25 May 1835)
10. Quoted in F.H. Herrick, *Audubon the Naturalist* (New York, 1917), Vol. 2, pp. 144-145
11. Houghton Library, pfMS Am 21, No. 38
12. Houghton Library, pfMS Am 21, No. 15, No. 28
13. Houghton Library, pfMS Am 21, No. 39
14. Houghton Library, pfMS Am 21, No. 48
15. Fries, p. 170. Audubon's "Ledger B" is held by the Audubon Museum, Henderson, Ky.
16. Houghton Library, pfMS Am 21, No. 47
17. Fries, p. 155

Leslie Hubricht at home

A COLLECTOR'S TALE

by Alan Solem, *Curator of Invertebrates*

photos by the author

Meridian, Mississippi is home for the current Miss America, Susan Akin; site of the Jimmie Rodgers (Father of Country Music, The Singing Brakeman) Museum; and, in a comfortable, well shaded house on a quiet street, location of a unique biological collection. This national treasure has been built by a remarkable individual, Leslie Hubricht — collector for 57 years, publishing scientist for 51 years, and world authority on the land snails of the Eastern United States.

For 46 years he has interacted with staff scientists at Field Museum of Natural History.

The 500,000 land snail specimens amassed by Leslie Hubricht exceed the materials now in the combined collections of major United States museums, form an irreplaceable record of what species lived where at stages during the twentieth-century destruction of eastern forests by agriculture and lumbering, provide benchmark data concerning repopulation of snail faunas in park areas, and thus are a treasure trove of data for students and scientists in the centuries to come.

Land snails are sensitive indicators of ecological change, locally extinguished by clear-cutting or grazing by stock, preserved in steep ravines and fenced woodlots. His collections are the major documentation of what lived where in the Eastern United States during the mid-twentieth century. As such, they will be of immense value to ecologists, systematists, environmentalists, and biogeographers of the future.

Field Museum's cooperation with Leslie Hubricht dates back to 1940, essentially spanning the curatorial careers of Fritz Haas (1938-1965) and Alan Solem (1956 to date). At first the cooperation was one-way. Hubricht donated duplicate specimens to help start our mollusk collection. Later he gave us all of his bulky freshwater unionid clams, principally from the Ozarks, as his interest focused more and more on land snails and the cost of moving his growing collection from city to city mounted. Since Fritz Haas's primary interest was in the unionid freshwater clams, this initial thrust of cooperation was of major significance to Field Museum.

Starting in 1960, we could reciprocate. As Hubricht discovered more and more new species, Field Museum staff prepared illustrations of type specimens for him and provided a permanent home for these name-bearing examples. A stream of optical photographs, drawings, and scanning electron microscope photographs flowed out shortly after the specimens came in. Our type collection increased, and Hubricht's bibliography mounted towards its current 147 publications.

The classic modern account of the land snails of the Eastern United States, Henry A. Pilsbry's *Land Mollusca of North America (North of Mexico)*, published by the Academy of Natural Sciences, Philadelphia from 1939 to 1948, became increasingly outdated, mainly as a result of Hubricht's collecting and publishing. Initially as an aid to his own collecting sallies, Hubricht had plotted county records for each species on separate outline maps. This was started when the second part of Pilsbry's man-

ual was issued in 1940 (Part 1, published in 1939, treated land mollusks from the Western United States), continued when the third section appeared in 1946, and was completed after the 1948 publication of Part 4. As Hubricht collected and studied, focusing on working areas that represented gaps in the data available to Pilsbry, each new record was transferred to these maps. Leslie, his maps, and a cluster of students and collectors seeking identifications, distributional data, and advice, were a familiar sight at national meetings of the American Malacological Union.

Publication of these maps and a summary of Hubricht's ideas on species of land snails in the Eastern United States became more and more essential. After retiring in February 1973, Leslie put full time effort into fieldwork to fill in distributional gaps, establish range limits, reviewing the collections in the major museums, then adding their records to his maps, and describing additional new species. Finally, late in 1983, the check list and 523 distributional maps were considered ready for publication. They were submitted to Field Museum, reviewed by outside specialists, and the monograph accepted. Minor editing, trimming and mounting of the maps, and production routine followed. The long-awaited *The Distributions of the Native Land Mollusks of the Eastern United States* was issued by Field Museum as *Fieldiana: Zoology*, new series, no. 24, on June 28, 1985.

This forms a milestone and will be the basis for the next generations of students to build upon. Far from being finished, Hubricht has a private list of collecting sites from which he has gotten only one or two examples each of additional new species. Totalling more than 20, here are collecting trips for the coming years as his collection continues to grow in number and scope, and his list of publications enlarges.

We will continue to assist in his studies. We are very proud and happy that he has chosen to will his collection to Field Museum of Natural History, and that we will become the permanent guardian of this unique and irreplaceable national treasure. While museums are the logical long-term custodians of such collections, the origin of each is mostly in the dedication and drive of individuals such as Leslie Hubricht. Indeed, up to 90 percent of the mollusk collections in major U.S. museums have resulted from the activities of individual collectors rather than by professional scientists and curators. Insects, herpetology, and fossils are other areas whose collections owe much to individuals.

Specimens are grouped according to vial size to conserve space. By means of an elaborate cross-index, Hubricht can locate any particular set in a few seconds.

It is most appropriate to portray Leslie Hubricht, to see how and why he was able to accomplish so much as a private individual. Not only because of intrinsic interest, but also as a lesson of encouragement to those who might be thinking of investigating some branch of natural history, but are uncertain as to what they might contribute.

Chance and choices are part of every life, and Hubricht's story exemplifies this pattern. Born in Los Angeles on January 11, 1908, his instincts as a naturalist surfaced at age two, when, after a rainstorm, he remembers noticing eight different species of ants running about the backyard. The family moved to Kokomo, Indiana in 1917, and for the next six years he bird-watched and looked at plants, but lacked a seminal influence to develop and focus his natural history instincts. After he

completed his first semester of high school, the family relocated to St. Louis, where he had to go to work and help provide support. Thus, his formal schooling ended early. The depression years came. Leslie moved from temporary job to temporary job as did most who survived that bleak episode in our nation's history.

A highlight in his life was the Webster Groves Nature Society, a group of amateur naturalists and some colleagues from local universities and the Missouri Botanical Garden. Such eventually famous naturalists as Ralph Swain the entomologist, Richard Grossenheider the mammalogist, Julian Steyermark who later worked as a botanist at Field Museum in the 1940s and 1950s, and Phil Rau of insect behavior fame, were at the start of careers. They interacted with Hubricht and encouraged his interests.

Because caves were common in the St. Louis area and little studied, he began exploration alone and with others, collecting isopods, amphipods, insects, and even snails. Specimens were sent to busy authorities for identifications, often languishing on cluttered desks for long periods. A critical turning point came when Edgar Anderson, the famous geneticist, arrived at the Missouri Botanical Garden and hired Hubricht as his research assistant. Joint field trips, coauthored papers, and a happy 7½-year association lasted until 1943. Anderson then went to Mexico for studies on Indian corn, and Hubricht was jobless. Rejected for military service, his scientific outlook molded by his interactions in St. Louis, a turning point in his life was at hand. About 1940 he had been offered a scholarship at the University of Chicago, despite his lack of a high school diploma. Having seen the underside of faculty life, and not wishing to teach, he had turned down this chance for an academic career.

By 1943 he had written or coauthored 24 scientific papers, mostly on botany, isopods, amphipods, cave life, but some notes on freshwater and land snails. His collection of shells became substantial. The first catalog entry was for *Rabdotus dealbatus ozarkensis*, an endemic Missouri subspecies, collected April 21, 1929. By 1943 there were 7,000 entries. He then made a critical choice, applying for a job with Remington Rand as a tabulating machine mechanic. Later he was to service UNIVAC computers. He remained with Remington Rand through its change into UNIVAC until his retirement in February 1973.

He took initial tabulating machine training in Ilion, New York, then was posted to Norfolk, Virginia until the end of 1945. This was followed by short periods in Detroit, Battle Creek, and Dallas. In May 1948 he was shifted to Danville, Virginia, where he remained for 7½ years. Pilsbry's monumental land snail monograph at last was completed, and the thousands of distributional records had been transferred onto Hubricht's maps.

Although Hubricht had described his first land snail species in 1938, *Anguispira rugoderma* from Pine Mountain, Kentucky, and published a number of scientific papers prior to 1943, there was a gap in his publishing activity—but not his collecting—from 1943 to 1949. In part, this was because he was living in and collecting from regions where only known species of land snails occurred. In part he was waiting for Pilsbry to summarize current knowledge. Until that happened, the only identification book available to him had been published in 1885 (W. J. Binney's *A Manual of American Land Shells*, Bulletin 28, United States National Museum), which was hopelessly out of date in the 1940s. In part he was honing his knowledge of land snails, beginning to study their anatomy, becoming focused on their ecology.

Things came together for Hubricht in the late 1940s. He was located in Danville, Virginia with convenient access to rich snail country—the Appalachian and Piedmont areas. Pilsbry had completed his summary work. If a land snail species was known, Pilsbry had discussed and figured it. If the land snail was a new species, Hubricht could recognize this fact—and describe it. Then came the happy and productive years. Collecting every weekend, vacation trips to even more interesting areas. Gleefully accepting, as a troubleshooter, offers of transfer by UNIVAC to Iowa in 1956; two years in Laredo, Texas; up to Louisville, Kentucky; brief periods in Memphis, Tennessee; Jackson, Mississippi; Montgomery, Ozark, and Mobile, Alabama; Jacksonville, Florida; Augusta, Savannah, Atlanta, Georgia; and then to Meridian, Mississippi in 1961. Each stay allowed him to survey and collect snails from a new area. His collection grew at rate of 2,000 lots of land snails annually.

And not only snails. He has sent more than 200 new species of millipedes to Richard L. Hoffman. On April 9, 1960, he found in Butler County, Alabama—to the amazement and chagrin of salamander specialists—a new genus of salamander, named *Phaeognathus hubrichti* Highton. This is only one of the 3 plants and 26 animals named after him by other scientists.

His own contributions have been prodigious. To date, 81 of the 523 land snail species from Eastern North America have been described by Leslie Hubricht, with the 20+ "need more material" species still to come. Only Henry A. Pilsbry, with 79 species described as sole author and 12 more with coauthors, exceeds Hubricht's contribution. Thomas Say, founder of American entomology and malacology in the early 1800s, is a dis-

Hubricht's collection is packed in modular crates to facilitate moving from city to city.

tinct third with 50 described land snail species from this region.

Dedicated efforts, perpetual interest in what might be found in the next valley, a job enabling him to spend time in most sections of the Eastern United States—these are keys to his success. Then active retirement involving spring collecting trips of three to four weeks when rains had activated the snails, with shorter fall trips coinciding with rains to fill in distributional gaps. His scientific training came from self study, association with enthusiastic naturalists in St. Louis, and especially from his 7½ years working with a leading biologist, Edgar Anderson.

The St. Louis years provided the focus and skills. His own efforts and organizational abilities resulted in assembling his unique collection, compiling the massive amounts of data, and, most importantly, deciding when to present this as a summary work. Not as a completed task, but as a mark along the way. Even casual glances at his published maps show many areas in which little or no collecting has been done (Wisconsin and Illinois are among the blanker areas), questions as to species range limits remain unsolved, and then there are the Appalachian Mountain areas, a center of evolution for many plants and animals, with undoubted new species and even genera to be discovered by dedicated and skilled collectors.

As his maps were refined and his descriptive papers multiplied, other malacologists urged him to publish them. In the mid-1970s he had sample pages prepared in close to the actual published form. At this point, Field Museum offered to help with issuing the final product. But Hubricht knew that he could, with his retirement years at hand, present a much more useful and comprehensive volume with additional work. And the added decade of effort and refinement followed.

It will be at least another 40 years before somebody will supersede his efforts, after another lifetime of dedicated efforts. His dream was a large one, and well fulfilled with the massive collection and well received summary publication. The latest entry in his mollusk catalog is lot 48,957, some Mississippi specimens of the land snail *Stenotrema leai aliciae*, collected November 23, 1985. He modestly points out that perhaps 6,000 lots of foreign land snails, freshwater clams, and some freshwater snails have been donated to museums previously, so he retains only about 43,000 lots with 500,000+ specimens.

This then is the summary of the career and contributions to date of a dedicated naturalist and collector, Leslie Hubricht. He has amassed an incomparable collection of a major group of organisms, published on them extensively, and prepared a landmark summary that will aid the research of others for decades to come. His efforts stand as an inspiration to all collectors and naturalists, whatever their field of interest.

Field Museum has been able to provide help to him over the years, and published his summary work with pride. But we have received so much from him in terms of donated specimens and the types deposited, that we are in his debt. And his confidence in the future of malacological research at Field Museum, indicated by willing his collection to us, is evidence of the interdependence of individual efforts and institutional continuity, both in advancing knowledge of the living world and preserving samples and records of its diversity. FM

Tours for Members

North Cape and Spitzbergen

June 27-July 12
$3,550-$6,440

Sail to the Land of the Midnight Sun, to the North Cape, where the sun shines 24 hours a day, aboard the "ultra deluxe" *Vistafjord*. This Five-Star ship represents the very epitome of ocean-going elegance: impeccable service, first-class cuisine, dazzling entertainment, luxurious living, and unrivaled attention to detail.

June 28. Embarkation from Hamburg, Germany. Here on the River Elbe is one of Europe's brightest and most exciting cities. Explore the entertainments of the St. Paul district, go sightseeing to City Hall and shopping along the busy Mockebergstrasse, or drive out to the peace and quiet of the picturesque Alster Lakes.

June 30. Molde, Norway. An unusually warm climate graces this delightful Norwegian town, which lies in the path of the Gulf Stream. Of special note: Romsdal Museum, an open-air compound of carefully assembled wooden houses dating back to the time of the Vikings. Aandalsnes, Norway. This small, picturesque village on the banks of the Rauma River lies below the soaring mountains and tumbling waterfalls of the Romsdal Valley. Ascend Stifjell mountain and cross the lofty bridge over Stigfoss Waterfalls. There are superb views down the Isterdal Valley, a fertile land filled with quiet peaceful farms.

July 3. Magdalena Bay, Spitzbergen. Massive glaciers in Spitzbergen's mountains inch their way down to the sea and Magdalena Bay, providing one of the world's most awesome natural spectacles. Cruising Lillehhok Fjord. Sailing past New Aalesund.

July 4. Longyearbyen, Spitzbergen. This is Spitzbergen's main settlement, located at the head of Advent Bay. It looks out on a coastline of seals, walrus, whales, and thousands of seabirds. Longyearbyen was named by an American engineer who founded it in 1906; the search for coal is still pursued in nearby Barentsburg.

July 5. Skarsvaag, Norway. Here is the most northerly point in Europe. Up the road and across the tundra from Skarsvaag, you will have a rare and awe-inspiring opportunity—a chance to stand on 1,000 ft. cliffs with nothing but polar ice-pack between you and the Arctic Ocean. In the summer, as you shall see, the sun shines all the time—24 hours a day.

July 6. Hammerfest, Norway. The brightly painted houses of the world's most northerly town contrast greatly with the harsh hills which are its backdrop. The attractive little shops offer a wide array of fine crafts, and the Hammerfest Museum records more than 200 years of the town's rich history.

Tromso, Norway. Sheltered by the islands along this craggy coastline, Tromso has long been an important fishing port and the largest city along the Arctic Circle. It was from Tromso that the famous explorer Admundsen staged his great expedition to the North Pole.

July 7. Narvik, Norway. This shipping port along the ice-blue fjords is surrounded by snow-tipped peaks that rival any in the country. Visit the crystal clear Rombaksfjord, which can be crossed via a magnificent new suspension bridge, then continue on to Bjerkvik and Gratangen, where you'll be surrounded by some of northern Europe's most beautiful wildflowers.

July 8. Sailing past the Arctic Circle and several seaside towns.

July 9. Hellesylt, Norway. An excellent starting point for excursions through a land where mountains soar to dizzying heights and waterfalls spread their lacework across the cliffs. Visit the orchards strung together in a brilliant garland of blossoms.

Geiranger, Norway. Geiranderfjord is one of the most splendid in all of Norway, enclosed on both sides by precipitous walls of rock. Visit Geiranger's tiny octagonal church, ascend Mt. Diasnibba and take in a magnificent panoramic view of the mountains, lakes and waterfalls. And save time to visit Tystig branch of Europe's most enormous glacier.

July 10. Bergen, Norway. This town of seven hills was founded in 1070 and is now one of Norway's major seaports. Windows on its past include the 13th-century fortress of Bergenhus, the Rosenkrantz Tower and Edvard Grieg's home at Troldhaugen, while present day Norway is typified by the busy fish and flower market.

July 12. We disembark in Hamburg, Germany.

Bertram G. Woodland, curator of petrology at Field Museum, will accompany the tour. He received his B.Sc. (honors) at the University of Wales and his Ph.D. at the University of Chicago. He will enrich this lovely cruise with his thorough knowledge of the rock formations and geologic history of the fjords, and discussions on the many interesting excursions. Working as a lecturer/tour leader is not a new experience for Bert, as he has escorted Field Museum groups through England and Wales (his native country), Galena, Illinois and several Grand Canyon rafting expeditions.

English Homes and Country Tour

July 1—15
$2,725 (double occupancy)

The "treasure houses" of Britain are best experienced within their architectural context and amidst their natural landscapes. Here we travel the paths of history and culture in the most immediate sense. But unlike most tours that rush you around for a cursory introduction, Field Museum is offering the discriminating traveler an opportunity to get to the heart of the English people and live in the English countryside as they do. The English are a thoroughly hospitable people, making you feel truly welcome as they take you into their comfortable homes as a guest of special importance. Past travelers have made lasting friendships with their hosts, returning again and again, even reciprocating the welcome as their English friends visited here. This view of a remarkable country is rare indeed, and especially relaxing since you stay several days in one home instead of spending your time on a bus. We stay in the southeastern counties where charming thatched villages complement vast cathedrals and living hedgerows set off lush royal gardens. Your hosts and hostesses include baronets, generals, company directors, doctors, members of Parliament, and landowners. Their homes range from mansions to more modest yet extremely comfortable cottages. Accommodations include use of a private bathroom.

Come and visit this 'tied to the past' yet forward-looking and charming country. Inquire into the customs and foibles of the people as you tour with not only a local guide, but with a scholar from Field Museum, who was born and raised in this remarkable country. Dr. Peter Crane got his Ph.D. in botany at the University of Reading. He is an associate curator in the Department of Geology at Field Museum and was recognized as one of ten "Outstanding Young Citizens" by the Chicago Junior Association of Commerce and Industry in 1985. He is excited about this unusual travel opportunity in his native country and invites you to join him and his countrymen in an exploration of English Homes and Country.

July 1. Depart Chicago O'Hare for Heathrow.

July 2. Arrive Heathrow. Met by tour director; board luxury coach for drive to Canterbury. Meet hostesses and drive to their homes to unpack and freshen up before lunch. At leisure for the rest of the day. In the evening dinner with hostesses.

July 3. Canterbury. A day in and around Canterbury. First a tour of the cathedral personally introduced by a canon from the cathedral staff, followed by a wander in Canterbury before lunch. After lunch further time to wander in Canterbury before visiting the village of Fordwich, which has the oldest town hall in England. Dinner in a private house.

July 4. South Kent. Drive south to the Cinque Port of Rye with its steep cobbled streets and period houses, and the world famous Mermaid Pub. A short drive to Bodiam Castle, built in 1386 to defend the Rother Valley from incursions by the French, followed by lunch at the Castle Pub. Another short drive to Great Dixter, a house built about 1450 (not long after Chaucer) and which now has a lovely garden containing a wide variety of unusual and interesting plants. Dinner in a private house.

July 5. Mid-Kent. After breakfast a leisurely drive to Leeds Castle for a private tour of what was described by Lord Conway as the "loveliest castle in the world." On through typical Kent countryside to Sissinghurst Castle, with its well-known and very beautiful garden. After lunch in the Castle restaurant, a short drive to Godinton Park for a private visit to this man-

sion with its fine Stuart panelling, carving, and magnificent furniture and porcelain. Dinner with hostesses.

July 6. Travel To Cambridge. Goodbye to the Canterbury hostesses. A short drive to the great Norman cathedral at Rochester in the heart of Dickens country where those who wish may attend a service. Then by tunnel under the River Thames northward into the county of Essex for lunch in a Tudor pub. After lunch a drive through the changing East Anglian countryside to meet and dine with Cambridge hostesses.

July 7. Suffolk. A day in Suffolk countryside immortalized by artist John Constable. First to Newmarket, home of the Sport of Kings, and center of the racing industry for a private tour of the Gallops, Tattersalls Selling Ring and Jockey Club for sherry. Lunch in Newmarket before driving to the medieval town of Bury St. Edmunds with its beautiful cathedral. In the late afternoon a short drive to Lavenham with time to explore the Guildhall dating from the 1520s, and the most splendid of all "Wool" churches before dining in one of the oldest buildings in Lavenham, the famous Swan Hotel.

July 8. Cambridge. A day in and around Cambridge, first visiting historic colleges and churches including Kings College Chapel, followed by a visit to the American Military Cemetery at Madingley which commemorates those Americans who died in northwest Europe in World War II. Lunch at a private house close to Cambridge. The afternoon in Cambridge exploring the city before dining with hostesses.

July 9. Travel To Chichester. After bidding farewell to Cambridge hostesses a drive south to West Sussex bypassing London to the west, and stopping for a pub lunch on the way. In the afternoon visit the Royal Horticultural Society Gardens at Wisley. These world-famous gardens contain an extraordinary collection of plants, flowers, trees, and shrubs, and attract visits by horticulturists from all over the world. A further journey to meet and later dine with hostesses.

July 10. Chichester. First to Bosham to visit Trinity Church of King Canute fame before going to Chichester for a stroll through the Pallants to the Hospice of St. Mary, then lunch in the Dolphin and Anchor. A Private tour of the Cathedral and free time to explore before having supper at the Festival Theatre Restaurant and attending a performance at the theatre.

July 11. Winchester. A drive west, skirting Portsmouth and Southampton, to Broadlands, home of the late Lord Mountbatten. A short drive to Winchester for lunch in the Wessex Hotel before visiting the cathedral and wandering in its environs. Return to Chichester through the rolling countryside of West Sussex. Dinner with Hostesses.

July 12. Mid-Sussex. Visit Boxgrove Priory which dates from the 12th century. A short drive to the thatched village of Amberley which nestles at the foot of the Downs. A pub lunch. Then to Petworth, a magnificent late 17th-century house which includes among its treasures works by Van Dyke and Turner, and a Grinling Gibbons room. A private dinner at Goodwood House followed by a tour of this historic home of the Dukes of Richmond and Gordon.

July 13th. Travel to London. Goodbye to Chichester hostesses, and drive to London for an orientation tour through the West End and City before arriving at the Mandeville Hotel and settling in there before lunch. Free afternoon and evening.

July 14. London. Free day and evening in London. The booklet on London in the personal folders given to each guest on arrival in England lists places of interest, how to get there and times of opening. A private tour of the Palace of Westminster, provided the Houses of Parliament are not in recess, will be arranged for those who wish.

July 15. Tour Ends. Those returning home will be escorted to London Heathrow by our tour director. Arrive Chicago O'Hare.

Alaska

$4,885

July 2-16

Experience the Great Land. Descriptions of Alaska are filled with superlatives—a state more than twice the size of Texas with a population less than that of Denver, 33,000 miles of coastline, 119 million acres of forest, 14 of the highest peaks in the United States culminating in Mt. Denali (formerly Mt. McKinley), at 20,320 feet. Alaska is equally a land of wildlife superlatives, from her great herds of caribou to swarming seabird rookeries to surging salmon in migration. When one thinks of Alaska one thinks of wilderness, of nature still fresh and undomesticated, of experiences dreamed of but mostly unavailable to us of the lower 48.

Join us for an Alaskan odyssey through a wide range of habitats from the rockbound fur seal and sea bird colonies of the Pribilofs, to the dripping forest and calving glaciers of the southeast, to the grandeur of the Alaskan Range, to the Fjordlike quiet and beauty of the inland passage.

Our travels will be by plane, train, bus, boat, and foot—whatever best enhances our experience. Emphasis will be on the land, its history, its wildlife. Interpretation combined with direct observation will provide an enjoyment and quality of experience unavailable to the casual visitor. Whatever your interest in natural history — marine mammals, birding, mountains, photography, flowers, forests, glaciers, rivers—this tour will show you Alaska in all its diversity and splendor.

Dr. David Willard, manager of Field Museum's bird and mammal collections, will be tour leader. He received his Ph.D. in Biology at Princeton University, where he was acting curator of Princeton Museum of Ornithology. He has been on a number of research expeditions for Field Museum. His experience in bird and animal identification and his experience as a tour leader will enrich this expedition for you. He invites you to share in the beauty of Alaska this summer.

July 2. Fly Chicago to Sitka; welcome dinner; overnight Sitka Sheffield Hotel.

July 3. Breakfast at hotel; morning city tour with stop at Raptor Center; lunch; late afternoon marine wildlife trip on private yacht *Taku Queen;* weather permitting, cruise to St. Lazaria National Wildlife Refuge; dinner on board; overnight Sitka Sheffield Hotel.

July 4. Breakfast at hotel; morning flight to Juneau; Mendenhall River Float Trip with lunch along the river; tour Mendenhall Wetlands; late afternoon options available: flightseeing, helicopter onto Mendenhall Glacier or a guided hike; evening outdoor salmon bake; overnight Sheffield Hotel Juneau.

July 5. Breakfast at hotel; morning flight to Glacier Bay; Glacier Bay cruise aboard the MV *Glacier Bay Explorer;* overnight on board the *Explorer;* lunch and dinner on board *Explorer.*

July 6. Cruising Glacier Bay in morning; return to Glacier Bay Lodge for lunch; afternoon flight to Juneau and on to Fairbanks. Dinner and overnight at Fairbanks Inn.

July 7. Breakfast at hotel; Alaska Railroad to Denali National Park; lunch at the Park entrance; afternoon free to see park service exhibits, slide shows and films; salmon bake dinner; overnight McKinley Chalets.

July 8. Early morning breakfast at the chalets; 6 a.m. departure by private bus through Denali National Park for wildlife viewing; arrive Kantishna Roadhouse and Bushcamp for lunch; tour of Kantishna by local homesteaders; wildlife tour exiting the park;return to chalets in early evening for dinner and overnight.

July 9. Breakfast and lunch at the chalets; chance to sleep in after long prior day; afternoon Alaska Railroad to Anchorage; dinner and overnight Sheraton Hotel.

July 10. Breakfast at hotel; late morning departure for Potters Marsh birding and on to Portage Glacier; Portage River Float Trip; lunch at the Portage Glacier Lodge; return to Achorage for overnight at the Sheraton.

July 11. Breakfast and lunch on own; morning free for optional activities, shopping, visit to the museum, etc.; afternoon Eagle River Float Trip with dinner and fireworks along the river; overnight Sheraton.

July 12. Breakfast at the hotel; fly Anchorage to St. George Island, with lunch en route; dinner and overnight at St. George Hotel.

July 13, 14. At St. George rookeries; breakfast and dinner at the hotel; lunch in the field. An evening gathering in the home of one of the Aleut community leaders.

July 15. Breakfast at St. George Hotel; fly St. George to Anchorage, arriving late afternoon; final group dinner and slide show; overnight Sheraton Hotel.

July 16. Breakfast at hotel; fly Anchorage to Chicago.

For reservations, call or write Dorothy Roder (322-8862), Tours Manager, Field Museum, Roosevelt Rd. at Lake Shore Dr., Chicago, Il 60605

Field Museum of Natural History
Membership Department
Roosevelt Road at Lake Shore Drive
Chicago, IL 60605-2499

FIELD MUSEUM OF NATURAL HISTORY BULLETIN

July/August 1986

Field Museum
of Natural History
Bulletin

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July/August 1986
Volume 57, Number 7

COVER

"Winter Sunrise on a Bristlecone Pine, White Mountains, California, 1974" is the title of this compelling photo by Galen Rowell, © Galen Rowell, Mountain Light Photography Inc.

This and 98 other photos by Rowell, comprising the special exhibit ***"Mountain Light,"*** *will be on display at Field Museum beginning July 5. The exhibit's 99 images taken on and around rugged mountain tops in Tibet, China, Pakistan, Nepal, and North America are incredible masterworks of wilderness photography.*

Galen Rowell's photographs have appeared in many major publications including National Geographic, Audubon, National Wildlife, Outside, *and* Sports Illustrated. *He is also the author of five wilderness books.*

Galen Rowell is "a genuine adventurer and—most of all—a world-class, absolutely brilliant photographer. He specializes in heights and distances, finding, climbing and then capturing on film those almost inaccessible peaks that most of us are destined only to dream of. . . ." PSA Journal *(Photographic Society of America, Inc.) January 1984.*

Field Museum of Natural History Bulletin (USPS 898-940) is published monthly, except combined July/August issue, by Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, Chicago, IL 60605-2496. Subscriptions: $6.00 annually, $3.00 for schools. Museum membership includes *Bulletin* subscription. Opinions expressed by authors are their own and do not necessarily reflect the policy of Field Museum. Unsolicited manuscripts are welcome. Museum phone: (312) 922-9410. Notification of address change should include address label and be sent to Membership Department. Postmaster: Please send form 3579 to Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, Chicago, IL 60605-2496.

Events

Summer Fun Workshops For Young People

July 9 through August 3

COME EXPLORE the vast and fascinating world of natural history in a *Summer Fun* workshop at Field Museum! Children ages 4-13 can journey to Africa and meet the animals that live on the plains and in the forests of this continent, or become a dinosaur sleuth and track the elusive "terrible lizards" through the Museum. Learn to draw Egyptian hieroglyphs, make and fly a kite, or visit the moon—there is something for everyone. Anthropologists, zoologists, artists, dancers, and actors bring their talents and expertise to create informative and creative workshops.

Summer Fun workshops are offered Wednesdays through Sundays, July 9 through August 3. Workshops are held throughout the Museum. Enrollment is limited and children must register in advance by mail. Call (312) 322-8854 for *Summer Fun* brochures, and up-to-date information about workshop availability.

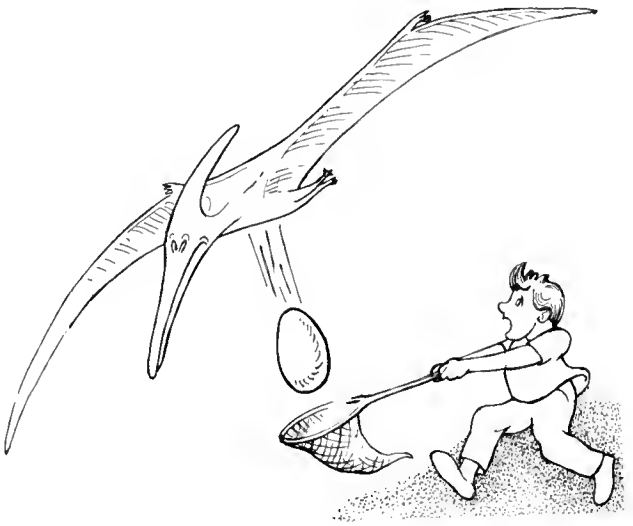
Family Feature

Time Marches On

July 12 and 13, 1:00-3:00pm

SCIENTISTS BELIEVE the earth celebrated its 4 billionth birthday before dinosaurs appeared. What was walking, swimming, crawling, or flying around before that? What did our planet look like? Draw your ideas on our giant time line and take a look at our world of long ago.

Family Features are free with museum admission and tickets are not required.



Family Feature

Gourds

August 16 and 17, 1:00-3:00pm

DON'T EAT YOUR VEGETABLES?! Gourds are vegetables like squashes and pumpkins, but the outer shell is more useful than the fruit within. Gourds such as the Bottle, Aladdin's turban, Dipper or Penguin are named for their shapes. Throughout the world, gourds are used as bottles, spoons, pipes, and even extraordinary sculpture. Find out how easily you could grow gourds at home. Prepare a gourd to create your own mask, cup, rattle, or fantastical creation.

Family Features are free with museum admission and tickets are not required.

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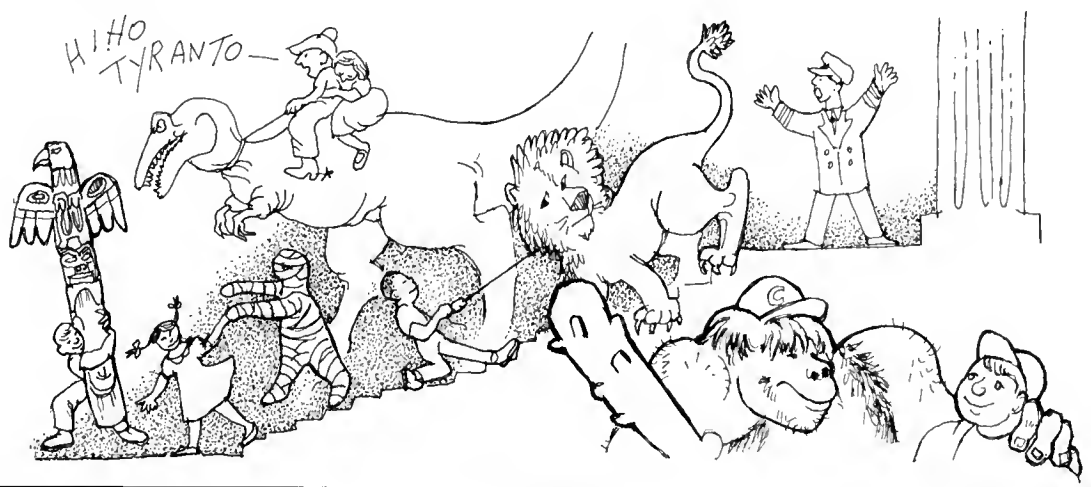


Events

Weekend Programs – July

EACH SATURDAY AND SUNDAY you are invited to explore the world of natural history at Field Museum. Free tours, demonstrations, and films related to ongoing exhibits at the Museum are designed for families and adults. Listed below are only a few of the numerous activities each weekend. Check the Weekend Programs sheet upon arrival for the complete schedule and program locations. These programs are partially supported by a grant from the Illinois Arts Council.

July

12 11:30am. *Ancient Egypt* (tour). Explore the traditions of ancient Egypt from everyday life to myths and mummies.

12:30pm. *Museum Safari* (tour). Seek out big game from Africa and mummies from ancient Egypt as you travel through Field Museum exhibits.

19 12:00 noon. *Continents Adrift* (demonstration). The concept of "moving" continents is illustrated with enormous puzzle pieces.

26 12:30pm. *Museum Safari* (tour). Seek out big game from Africa and mummies from ancient Egypt as you travel through Field Museum exhibits.

Weekend Programs – August

August

2 11:30am. *Ancient Egypt* (tour). Explore the traditions of ancient Egypt from everyday life to myths and mummies.

3 12:30pm. *Treasures from the Totem Forest* (tour). A walk through Museum exhibits introduces the Indians of southeast Alaska and British Columbia, their totem poles and masks.

9 12:30pm. *Museum Safari* (tour). Seek out big game from Africa and mummies from ancient Egypt as you travel through Field Museum exhibits.

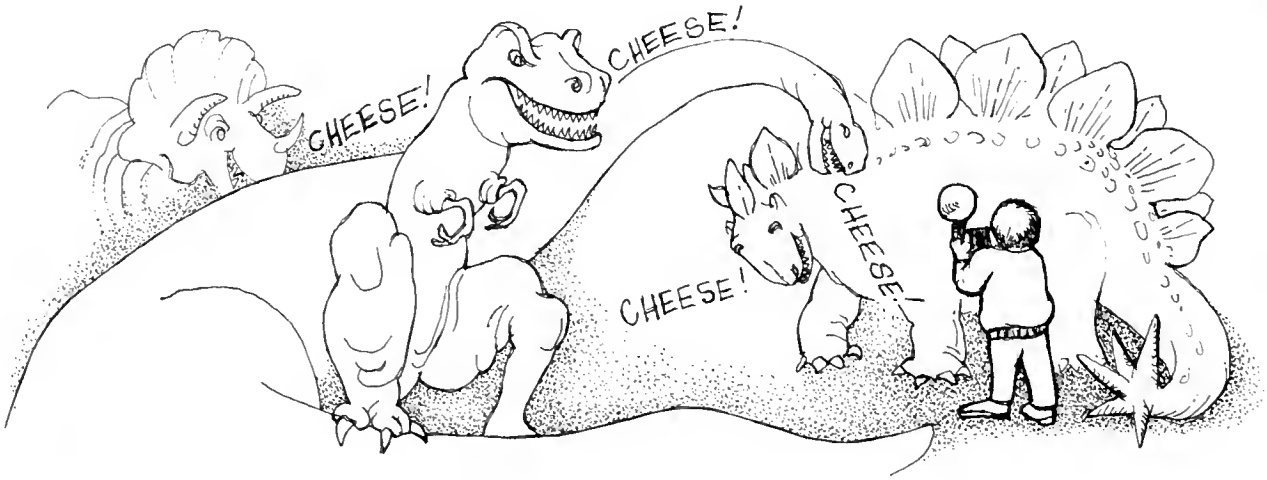
10 12:00 noon. *Life in Ancient Egypt* (tour). Focus on the objects and practices which illustrate ancient life in the Nile Valley.

17 2:00pm. *Traditional China* (tour). Examine the imagery, history and lifestyles represented by Chinese jades and other masterworks.

23 12:30pm. *Museum Safari* (tour). Seek out big game from Africa and mummies from ancient Egypt as you travel through Field Museum exhibits.

24 2:00pm. *Chinese Ceramic Traditions* (tour). Explore 6,000 years of Chinese ceramic art.

These public programs are free with museum admission and tickets are not required.



THE PIGEON

Symbol of the Holy Spirit or Scourge of City Life, Certainly the Most Controversial Member of the Bird Kingdom

by Jerry Sullivan

I should say right at the start that I like pigeons. Mine is not a common attitude these days. Pigeons are routinely castigated as filthy, disease-ridden pests. Pigeon control is a substantial business. Pigeon consultants advise the government on how to minimize the pigeon presence at major outdoor events, like presidential inaugurations. City ordinances make outlaws of old ladies scattering stale bread in the park. One Chicago suburb recently outlawed all backyard bird feeders on the dubious grounds that they were supporting the local pigeon population.

Another suburb, apparently acting under the influence of too many *Wild Kingdom* reruns, tried transportation as a means of ridding its downtown pigeons. The birds were trapped and driven to a nearby forest preserve, where they were released. This control program is a particular favorite of mine. You trap a bird whose homing abilities have been known since ancient times, a bird capable of flying as fast as 90 miles an hour, and you transport it from its natural home on the pavement to a forest preserve where it will find nothing of interest except the trash cans in the picnic groves. The odds are that the pigeons, who don't have to deal with traffic lights and speed limits, will arrive back in town long before the trapper. The whole plan sounds like a scheme to pad the city payroll. Certainly the municipal pigeon trapper is never going to run out of birds to catch.

The reason for all this aggression against these peaceable birds can be summed up in a single word: Droppings. Yes, they carry diseases, but I doubt if they would attract all this outrage if they were a bit less obtrusive. People are offended by dung-splattered sidewalks and chalky walls, not to mention the occasional well-aimed dropping that drops right into your hair. The common opinion is that pigeons are unusually filthy, but the fact is that the dung situation would be just as bad if downtown Chicago was supporting a few hundred thousand birds of paradise or quetzals. Animals in large numbers produce large amounts of dung. My guess is that really strong anti-pigeon feelings started to develop about the time horses disappeared from the urban scene. If the streets were still full of horse droppings, I doubt if anybody would even notice the pigeons.

But, as I said, I am hopelessly biased toward pigeons. I have several reasons for this opinion. The most important of them stems from a consideration of what would live downtown if we eliminated the pigeons. Nothing. Pigeons have managed to adapt themselves to some of the least inviting habitats we have created. They don't need trees; they don't need grass; they don't even need earth. They can live their whole lives on pavement. If they didn't live in our most citified landscapes, humans would be the only things moving.

Pigeons also live their lives right in front of us. Watch pigeons in the park or on the pavement, and you can see enacted the rituals of love and rivalry that most of us get to see only on public television. A cock starts his display with a leaping flight toward the hen. He claps his wings together on the downstroke. He lands in front of her and approaches with his neck inflated and expanded, the feathers of his neck, belly, lower back, and rump held erect. When he reaches the hen, he stands with his head held high, his beak pointing downward. He then turns in a tight circle while bowing low.

To get the full effect of this display, you have to imagine it from the hen's point of view. What she sees is a black beak crowned by a white cere and a pair of orange eyes. The pupils actually contract during the display, making the irises as large and bright as possible. Surrounding this image is a wreath of iridescent green, bronze, and purple, the cock's erected neck feathers.

Jerry Sullivan edited *Chicago Area Birds*, published recently by Chicago Review Press; writes a column, "Field and Street," for the *Chicago Reader*; and has written extensively on birds of the Chicago area.

The final stage of courtship, the act that precedes copulation, is called billing. The cock grasps the hen's beak in his, using the same sort of motion he would use to feed a chick. If you want to be anthropomorphic, you could say they were kissing, and through the centuries this has often been said. By the way, billing comes *after* cooing, which is done as part of the bowing display.

There is nothing degenerate about these displays. They are essentially the same as the displays of the rock dove, the Eurasian ancestor of all domestic pigeons, and they have a strong family resemblance to the actions of mourning doves and other totally wild members of the Columbidae.

I am also impressed by the beauty of pigeons. They are among the most accomplished of flyers. They can streak by faster than the legal limit or lightly touch down on a 25th floor window ledge in a 40 mile-an-hour wind.

Pigeons were probably our first domestic birds. Archaeological surmise says that Neolithic peoples kept them. The evidence takes them back to 4500 B.C. in Iraq. There are references to them in Egypt from before 3000 B.C. And of course, the Bible is full of them. A dove brings Noah the news that the Flood is over, that the dry land is emerging. In some versions of the myth, the dove reveals the news by returning to the Ark with red clay stuck to its feet. Noah then asked God to turn the bird's feet permanently red in honor of the moment, and God agreed. Thus the pigeons in Daley Plaza have red feet.

Abraham sealed his covenant with God by sacrificing two pigeons, and pigeons and doves are the only birds mentioned in the Torah as acceptable sacrifices in the temple. A pair of pigeons became the standard sacrifice for a woman to make when she returned to community life after giving birth, and in the Gospel of Luke, we read that Mary made such a sacrifice after the birth of Jesus.

In the New Testament, the dove becomes a symbol of the Holy Spirit, of God Himself, and you can't do much better than that, symbolically speaking.

I should interject here that the words "pigeon" and "dove" have no scientific standing. Dove comes from Anglo-Saxon; pigeon comes from Norman French, and at one time, the two words had identical meanings in their respective tongues. These days, we tend to apply the word "dove" to the smaller members of the Columbidae and the word "pigeon" to the bigger birds. But there is no sharp line of demarcation. Witness the fact that the wild ancestor of the domestic pigeon is the rock dove.

Pigeons belong to a family of about 300 species that live in tropical and temperate regions worldwide. They are mostly seed eaters, although some species specialize in fruit. Their beaks are small and rather weak. They cannot crush large seeds the way parrots can, so they are generally confined to eating things they can swallow whole. The smallest pigeons are not much bigger than a sparrow. The largest are the ground-dwelling Victoria crown-pigeons, birds from New Guinea that are almost as big as a turkey hen.

Despite the size difference, the pigeons show a strong family resemblance. They tend to be small-headed and plump-bodied, and their characteristic head-bobbing walk is instantly recognizable. Take a stroll through the bird house at the Lincoln Park Zoo—there are some Victoria crowned pigeons there—and you will have little trouble recognizing a pigeon, even if you have no idea what species it is.

A typical pigeon nests, roosts, and takes refuge in trees, while doing its eating on the ground. The rock dove departs from that pattern by nesting in sheltered places on cliff faces. This habit allowed the bird to exploit barren land where trees were scarce or absent, and it also pre-adapted them to nesting under sheltering overhangs on the walls of buildings. In India today, truly wild rock doves still construct their nests on walls. From this, we can surmise the likely source of their domestication. Rock doves probably moved into buildings in the villages and towns of early civilizations. They could nest there and feed in the open fields and pastures that the new science of agricuture created. Such a close association with humanity could reasonably lead to the importance of pigeons and doves as symbols, and it probably led to the realization that you could breed and raise these creatures in cages and enjoy the fat, tender squabs for dinner.

We don't know when humans began to use pigeons for purposes other than supper, but we have references in ancient literature that show Julius Caesar sending messages via pigeon during his campaigns in Gaul. And we know from a reference in the Talmud from about A.D. 200 that people were racing pigeons. Not only racing them, but betting on the races. The Talmud specifies that pigeon racers are not trustworthy witnesses and should not be allowed to testify in court. Later interpreters of this text believe that the prohibition is based on a reluctance to accept the word of gamblers, and pigeon racers are assumed to be gamblers.

The rock dove lives in treeless places from the Hebrides to India. Like its domestic descendants, it is a social bird. Its nests are clustered in choice locations, and it feeds in flocks on open ground. Rock doves have been recorded as breeding in all seasons, and our pigeons

maintain that tradition, reproducing year-around even in Chicago. The birds produce only one or two offspring per brood, but more-or-less continuous nesting brings up their reproductive potential.

Pigeons are models of traditional morality. They are monogamous, forming durable pairs rather than seeking new partners for each nesting.

They are also thoroughly modern creatures who share all their responsibilities. They seek a nest site together, cooperate in building the nests, split the job of incubating the eggs—the female usually sits by night, the male by day—and the job of feeding the young once they hatch.

From the time the nest site is selected until the female lays her first egg, she is sexually receptive to other cocks, and during this period, the male strives to keep her away from possible rivals. In the terminology of pigeon breeders, he drives her, dogging her footsteps, sometimes literally treading on her tail. If she gets too close to other males, he may peck at her neck or head, softly if the perceived threat is not too ominous, vigorously if she gets close to a serious rival. This is another piece of pigeon behavior which you can see for yourself.

Pigeon eggs hatch after 17 or 18 days of incubation, and for the first few days of the squabs' lives, they are fed almost exclusively on pigeon milk, a substance produced in the crops of both male and female adults.

As the day of hatching approaches, the pituitary hormone prolactin stimulates the pigeon's crop, the muscular pouch at the base of the throat where food is reduced to a digestible form. The walls of the crop thicken, and the lobes that will produce the milk enlarge. By the time the young hatch, the cells on the inner surface of these lobes are filled with globules of fat. The cells slough off gradually, releasing a cream-colored substance with a consistency like milk curds. The milk averages 10 to 20 percent protein and as much as one-third fat.

Pigeon milk is an elegant solution to a problem that all seed-eating birds face: how do you feed your young enough to allow them to grow from egg-size to adulthood in a matter of weeks. Many seed-eaters feed their young on high-protein insects; the pigeons create their milk.

Parents begin to recognize their young as individuals about the time of fledging, but they will adopt and care for strange youngsters placed in their nests—even though their initial alarms at the sight of the foundling implies that they know it is not their own.

The pigeons of North America are all feral birds, that is, they are birds who were once domestic — or whose ancestors were once domestic — but have now escaped to live a wild life. The first pigeons to reach North America were carried by the French to Port Royal, Nova Scotia, in 1606. The English imported birds to Virginia in 1621 or 1622 and to Massachusetts by 1942.

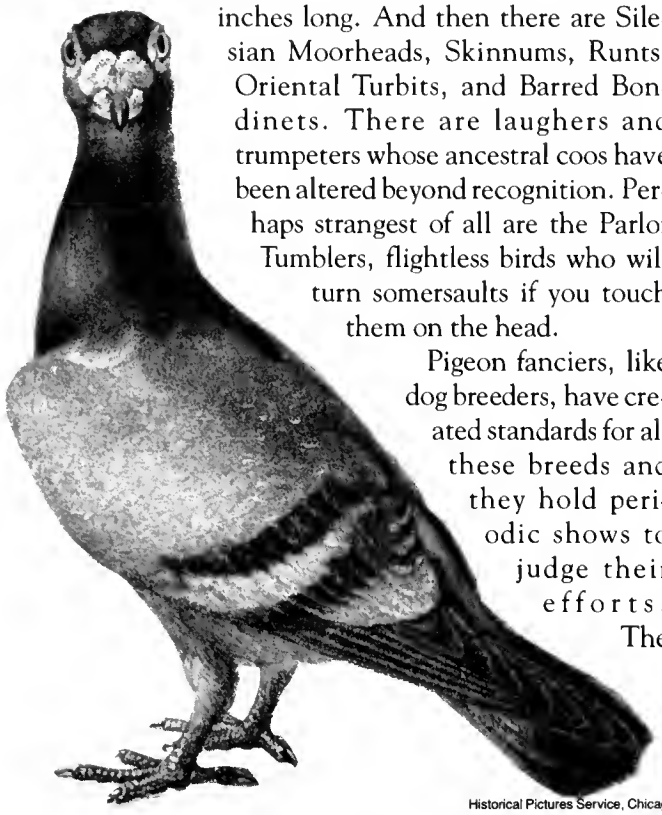
Doubtless, escapes from those first dove cotes provided our first feral birds, and escapes from contemporary pigeon breeders still provide some additional birds to our flocks. In these feral flocks, there is a strong tendency for the birds to approach the color and pattern of a wild rock dove. Rock doves are gray with a large white spot on the lower back just above the rump. Black tips on the upper wing coverts and secondary flight feathers show as two dark vertical bands on the folded wings, and there is another dark band at the tip of the tail. The iridescent display feathers that encircle the neck reflect green, bronze, and purple.

The rust-colored or chestnut brown birds, the white birds, the birds variously pied and speckled, are all showing souvenirs of their captive ancestors who presumably belonged to one of the 300 or so breeds that pigeon fanciers have developed over the centuries. Some of these breeds were created primarily for racing, but many of them were bred solely for aesthetic reasons. A breeder hatched a bird with an odd genetic twist and decided for those traits. Some of the results are bizarre.

Consider, for example, the pouter pigeons. Pouters with their bodies held almost upright, unlike the usual pigeon stance with the body held horizontally. Their legs are long and skinny. The lower portions of their bodies—their pelvises and bellies—are almost equally attenuated. But they can inflate their crops to the size of a baseball. A standing bird in full pout looks top-heavy, as if it might fall over at any moment. In previous centuries, pouters were quite popular in England, and in their profiles, you can see a sort of Regency dandy with tights on his legs, his middle cinched in with a snug waistcoat, and huge explosion of lace at his throat.

Or consider the Barbs, large-headed birds whose eyes are surrounded by flat discs of naked skin. In a full-face view, the birds' heads look like spools of thread. And the Archangels, breeds with ten different color varieties; the Jacobins, birds whose head and neck feathers are fluffed out in a large, loose mane; the Duchess and the Ptarmigan with their feathered feet; the Frillbacks, birds whose back feathers and outer wing coverts are curled at the tips; the Maltese, a bird with long straight legs, a long neck, and an upright tail. The Maltese looks like what you would come up with if you tried to make a chicken with nothing but an imperfect description in a strange language to guide you.

There are Tiger Swallows whose foot feathering—



Historical Pictures Service, Chicago

the correct term is muffs—are several inches long. And then there are Silesian Moorheads, Skinnums, Runts, Oriental Turbits, and Barred Bondinets. There are laughers and trumpeters whose ancestral coos have been altered beyond recognition. Perhaps strangest of all are the Parlor Tumblers, flightless birds who will turn somersaults if you touch them on the head.

Pigeon fanciers, like dog breeders, have created standards for all these breeds and they hold periodic shows to judge their efforts. The biggest of these is the National Pigeon Show, an annual event that attracts 8,000 to 10,000 birds, and their breeders, from all over the world.

Jacobins, Duchesses, and the rest are called fancy pigeons, in distinction to the racing homers. The homers are bred for winning races, and in them the strength, speed, stamina, and homing ability of wild pigeons have been reinforced by generations of selective breeding.

Bob Adolph, president of a downstate pigeon club, told me that as many as 600,000 people in the U.S. raise pigeons, and many of these belong to clubs that organize races. The shortest race in such competitions is 100 miles. Six hundred miles is a common distance, and some clubs run 1,000-mile races.

Adolph's club uses Tulsa as a starting point for the 600-mile race. Usually, Ozark Air Lines flies the birds to Tulsa and releases them, preferably early in the morning. Once the birds are on the wing, the airline calls Adolph to pass along the time of release. Late in the day, if all goes well, the tired birds will be back at their home roosts.

The speeds these racing birds maintain are almost unbelievable. One of Adolph's birds covered 700 miles in 13 hours and 10 minutes. According to my calculator, the bird averaged about 53 miles an hour for the entire flight.

The process of preparing birds for such achievements begins when they are two or three months old. At that age, Adolph take his birds a mile or two from home and lets them fly back. He gradually increases the distance, but he doesn't start letting them try the long flights until they are a year old. After those first short flights around the roost, the birds need no more practice at homing. From then on the long flights are only for conditioning, like the practice runs of a marathoner.

The homing abilities of pigeons are just a special instance of the navigational skills possessed by many birds. We know that pigeons use landmarks—including buildings and other creations of humanity—for orientation. But a pigeon starting out on a 600-mile race is not going to get very far relying on landmarks. We know that pigeons, like other birds, use the sun as a compass, and that they know how to compensate for the time of day and the sun's apparent movement through the sky. We also know that pigeons released on overcast days can immediately orient themselves toward home—unless they are wearing magnets. William T. Keeton of Cornell University ran a series of experiments, attaching magnets to some birds and magnetic brass bars to others. The birds wearing brass usually oriented toward home as soon as Keeton released them. The magnetized birds scattered at random. Keeton concluded that the birds were using the earth's magnetic field to show them the correct direction.

No recital of the virtues of pigeondom would be complete without the most extravagently complimentary words ever written about *Columba livia.* They come from T. H. White's book *The Goshawk,* an account of White's attempt to train a goshawk for falconry. He trapped pigeons to feed his hawk, and sometimes he resented the cautious way his quarry avoided the trap. But as he thought more about pigeons, he realized how admirable they were:

"What a peace-loving but prudent race they were," [he wrote] "not predatory and yet not craven. Of all the birds, I thought, they must be the best citizens, the most susceptible to the principles of the League of Nations. They were not hysterical, but able to escape danger. For panic as an urge to safety they substituted foresight, cunning and equanimity. They were admirable parents and affectionate lovers. They were hard to kill. It was as if they possessed the maximum of insight into the basic wickedness of the world, and the maximum of circumspection in opposing their own wisdom to evade it. Grey quakers incessantly caravanning in covered wagons, through deserts of savages and cannibals, they loved one another and wisely fled." FM

Harry Hoogstraal
1917-1986

by **Robert Traub** *and* **Robert F. Inger**

Harry Hoogstraal, a Field Museum benefactor and an internationally renowned medical zoologist, died in Cairo, Egypt, on his 69th birthday, February 24 of this year. In the course of his outstanding career, Dr. Hoogstraal was elected president of the American Society of Parasitologists and of the American Society of Tropical Medicine and Hygiene and was presented with several of the highest medals of these organizations and other awards. He also received 25 additional professional honors, including distinguished service awards from the Department of the Navy, the Department of Defense, the Department of State, and the Medal of Honor for Scientific Research from the Arab Republic of Egypt.

Dr. Hoogstraal had the signal distinction of being nominated as a foreign fellow of the Royal Society, but his death occurred before the election was held. His bibliography of more than 500 scientific papers, all of lasting value, includes books, monographs, and other large works. Dr. Hoogstraal was rightly regarded as the world's leading authority on ticks and tick-borne diseases, but had contributed significantly to our knowledge of other arthropod-borne infections and their reservoirs in nature. The Department of Medical Zoology at the United States Naval Medical Research Unit No. 3 (NAMRU-3) in Cairo was organized by Dr. Hoostraal in 1949, and under his distinguished leadership this unit served as a base of operations for studies that were carried out in many parts of the world.

The ultimate basis of Hoogstraal's incredible success in so many aspects of medical ecology lay in his understanding, appreciation, and application of the fundamentals of natural history, a talent whose roots were deep in his boyhood in Chicago and his association with the Field Museum, where after haunting the halls and library, he and his sister Catherine were permitted to attend lectures nominally restricted to adults. His first formal ties with the Museum began when, inspired by his mentor here, K.P. Schmidt, chief curator of Zoology, Hoogstraal organized and led groups of fellow students on a series of biological expeditions to hitherto unstudied parts of Mexico.

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Harry Hoogstraal with "Maki" upon return from Madagascar, 1949.

From their inception in 1938, these summer expeditions resulted in vast collections of zoological and botanical specimens, the bulk of which were deposited in the Field Museum. The Third and Fourth Biological Expeditions were unique in the period of 1940-41, for they were carefully planned, staffed, and executed to provide detailed and accurate studies of the fauna and flora in various habitats in transects on remote mountains, ranging from the tropical lowlands and semidesert to areas above the timberline. Those who regarded the North American mammalian fauna as well known were surprised by results—even a new species and several new subspecies of rodents were collected. The intensity and scope of the field operations are illustrated by the findings of the Fourth Biological Expedition concerning just one very small group of insects, the Siphonaptera (fleas). At a time when the entire roster of species of fleas for the world was estimated as about 1,000 species,

Robert Traub is honorary curator of Siphonaptera, Department of Entomology, Museum Support Center, Smithsonian Institution; Robert F. Inger is curator of Amphibians and Reptiles, Field Museum.

2 new genera and 13 new species of fleas were found on or near Mt. Tancitaro alone.

Harry Hoogstraal was critically injured in an accident during the 1940 trip to Mexico, sustaining a broken back and other serious injuries, followed by osteomyelitis. His courage, determination, and intensive interest in biology were demonstrated by his return to similar arduous and hazardous activities in Mexico in 1941, despite the severe bouts of intermittent pain he suffered for the rest of his life.

During World War II Hoogstraal's excellent background and training proved eminently useful in U.S. Army investigations on the systematics and ecology of mosquitoes in the U.S., New Guinea, and the Philippines. Even under wartime conditions he managed to collect vertebrates and arthropods of special interest. While still assigned to the Philippines, Hoogstraal, with the support of K.P. Schmidt, organized and directed the Field Museum Philippines Zoological Expedition. He then took his discharge from the Army in the Philippines and assumed responsibility for negotiations with the newly established Republic of the Philippines and for logistics and selection of personnel. This expedition, in the field in Luzon, Palawan, and Mindanao from April, 1946 to May, 1947, made such important collections of mammals, amphibians, and reptiles that Field Museum now has one of the two or three most important collections of these animals from the Philippines. Indirectly, the expedition later led through one of the Filipino participants, Dr. Dioscoro Rabor, to the acquisition of large collections of Philippine birds.

After this expedition, Hoogstraal participated in the University of California/U.S. Navy Africa-Madagascar Expedition, 1948-49. From his base with NAMRU-3 he planned and then led many important collecting trips to various parts of Africa, Arabia, and Asia Minor, Nepal, Australia, Madagascar, and many other parts of the world. Unfortunately for those of us interested in its fauna, he did not work in tropical America. All of these trips yielded important additions to the collections of the Field Museum, for example, almost 2,000 mammals from Africa, about 2,500 birds from Egypt, and over 700 reptiles from Madagascar. In all, we have received over 5,000 birds, 10,000 mammals, 12,000 amphibians and reptiles, and well over 100,000 insects and related organisms from Hoogstraal. These accessions have added significantly to the international importance of Field Museum as a center of research.

Harry Hoogstraal was not only a scientist of international stature, but he actually operated at a global level, writing thousands of letters annually to so many countries that his mailing list resembled a stamp collector's guide. He served as an external examiner for graduate students attending at least eight universities in a total of seven countries and as a visiting lecturer in five universities in Egypt, the U.S.A., and the United Kingdom. He was a research associate of the Field Museum, the Bishop Museum (Honolulu) and the Smithsonian Institution (National Museum of Natural History). Hoogstraal rendered a tremendous service to science by arranging for and editing the translations of more than 2,000 scientific papers and books from the U.S.S.R., Eastern Europe, and China, and by distributing them gratis to scientists everywhere. In this way specialists had access to important papers that they otherwise may never have seen or even known about.

It is impossible to do justice to his innumerable and invaluable contributions to medical entomology and acarology (the study of mites and ticks), parasitology, protozoology, virology, rickettsiology, bacteriology, medical ecology, and epidemiology, but these encompass far more than formal books and papers. He spent a great deal of his time inspiring, stimulating, and guiding students all over the world, and when their reports and manuscripts were finished, Harry would critically examine or revise the papers, recommend specific measures that might be required to obtain more suitable data and then help with publication. Because of his erudition, aptitude, attitudes, integrity, and his standing as an expert on vector-borne infections, he was a member of several international commissions investigating problems in virology and other arthropod-borne infections. These same attributes led to his being invited to present lectures or participate in symposia all over Europe, including the U.S.S.R., and many countries in Asia and Africa, as well as the U.S.A.

However, Harry Hoogstraal's reputation was not just as a model scientist, for he was well known as a connoisseur, with particular reference to ballet, works of art, Egyptian antiquities and ornamental plants, especially cacti. A recent activity, sculpting, brought much favorable comment. His generosity was proverbial and he was a superb host, not only to his ever-present house guests, but to friends and colleagues at meetings and during travel, and also to all the children in the neighborhood. He was uncle to virtually everyone, but was so well loved and respected that the parents of 43 children selected him as godfather.

The measure of Harry Hoogstraal's accomplishments will surely increase with the passage of time, and at the Field Museum his memory is enshrined in the halls and in the specimen drawers, as well as in reams of books and papers in the library and in the minds, souls, and hearts of his colleagues and friends. FM

Wildflowers

of the Chicago Area

Late Summer and Autumn

by Floyd A. Swink

photos courtesy of the author except where indicated

In the temperate zone there are two basic times for increased interest in wildflowers. One is the spring (treated in the April *Bulletin*), and the other is late summer and autumn. Reasons for this include cool weather, lack of mosquitoes, and return to school, and thus reductions in vacations away from home.

It may be surprising to learn that many more flowers in the Chicago area can be seen in bloom on Labor Day than on any peak day in spring. In fact, the Chicago area has 27 species of asters and 21 species of goldenrods—seeing these 48 species alone would make quite a day's field trip. These belong to the Composite Family, and members of that family are purposely treated first here in order to give some idea of the wealth of floristic beauty contained in this large family.

Blazing Star (Liatris aspera) *Gay Feather* (Liatris pycnostachya)

❀ **Blazing Star** *(Liatris aspera)*
Composite Family (Compositae)

This is found on dry prairie and is also very common in the sand regions. The common names in *Liatris* overlap, but generally the blazing stars have large flower heads which occur somewhat separately, while the gay feathers have dense spikes. Examination with a hand lens reveals a beautiful display of tiny disk florets compacted together into a head. It is one of the best plants to exhibit the fact that the flower head is not really a single flower, but rather a "composite" of a number of small flowers.

❀ **Gay Feather** *(Liatris pycnostachya)*
Composite Family (Compositae)

This beautiful flower is often sold as an ornamental by florists. The genus *Liatris* is very unusual in that it is one of the very few plants in which the floral spike has the oldest flowers at the top rather than at the bottom. This is a fine prairie plant; its close relative, *Liatris spicata*, equally beautiful, is often found in moist habitats.

❀ **Bur Marigold** *(Bidens coronata)*
Composite Family (Compositae)

The combination of heavily disturbed areas in our suburbs, together with a flat substrate above a clay soil which is near the surface, gives opportunity for this and closely related species to grow almost to the exclusion of everything else. The bur marigolds are often mistaken for sunflowers, but actually they are "stick-tights." These are the plants with flat seedlike fruits which have two or more points at the tip. The two-pointed ones look like

Floyd A. Swink is a taxonomist at Morton Arboretum, Lisle, Illinois, and has served as lecturer and tour leader of Field Museum botanical trips in the Chicago area. His article "Spring Wildflowers of the Chicago Area" appeared in the April 1986 Bulletin. *Mr. Swank is co-author (with Gerould Wilhelm) of* Plants of the Chicago Region, *3rd ed., 922 pp., published by Morton Arboretum.*

Joe Pye Weed (Eupatorium maculatum)

David M. Walsten

miniature pitchforks. These tips (or awns) have reverse-pointed barbs which cause them to cling to clothing in great numbers.

❀ **Joe Pye Weed** *(Eupatorium purpureum)*
Composite Family (Compositae)

This unusual common name is derived from Joe Pye, an Indian medicineman of New England, who treated typhus fever with a decoction made from this plant. It is one of the tallest nonwoody plants in the forest, and is rather easily identified by the fact that the leaves are borne in circles (or whorls) of three or more. A close relative, *Eupatorium maculatum*, is frequent in calcareous marshes.

❀ **White Lettuce** *(Prenanthes alba)*
Composite Family (Compositae)

This plant is also known as rattlesnake root, lion's foot, and gall-of-the-earth. It is noted for the extreme variability of its foliage. The plant is related to lettuce and possesses milky juice. It is a woodland species. The long hairs on the seedlike fruit are known as the pappus (compare the blow-away seed-head of the dandelion), and in this species are a deep reddish-brown.

White Lettuce (Prenanthes alba)

Sneezeweed (Helenium autumnale)

❀ **Sneezeweed** *(Helenium autumnale)*
Composite Family (Compositae)

This plant has a preference for moist open ground. In low pastures it is avoided by livestock because of its bitter taste, and in such habitats it associates with the blue vervain *(Verbena hastata)*. In spite of its name, the sneezeweed is not a prime cause of hayfever (neither is goldenrod, in spite of its reputation). The bulk of late-summer and autumn pollinosis is rather caused by inconspicuously flowering plants, especially ragweeds.

❀ **Ironweed** *(Vernonia missurica)*
Composite Family (Compositae)

This is a very tough plant (perhaps thus giving the name ironweed) which is also rejected by grazing livestock, and may often associate with sneezeweed and blue vervain in the above-mentioned pastures. Its beautiful flower cluster rivals the blazing star and gay feather in color, but differs in the shape of the cluster, which is typically flat-topped rather than spikelike.

Ironweed (Vernonia missurica)

John and Kitty Kohout

Old-Field Goldenrod (Solidago nemoralis)

❀ **Old-Field Goldenrod** *(Solidago nemoralis)*
Composite Family (Compositae)

This species has the typical one-sided appearance of the cluster which we normally associate with goldenrods. As its name implies, it is common in old fields which have been abandoned. It is especially beautiful on the foredunes of Lake Michigan in the Miller area of Gary, Indiana, a few blocks west of Lake Street. In this habitat the plant associates with little bluestem grass.

❀ **Stiff Goldenrod** *(Solidago rigida)*
Composite Family (Compositae)

This is a flat-topped species, occurring commonly in dry prairie, especially west of Chicago. It consistently associates with the wild bergamot *(Monarda fistulosa)*, prairie dock *(Silphium terebinthinaceum)*, and yellow coneflower *(Ratibida pinnata)*. Sometimes the plants thrive in clay soil, and I once observed it, along with yellow coneflower, invading an abandoned clay tennis court!

Karl Bartel

Showy Goldenrod (Solidago speciosa)

❀ **Showy Goldenrod** *(Solidago speciosa)*
Composite Family (Compositae)

This, our showiest member of the genus, has a marked preference for sandy soil. A September hike in the dune country is accented by the beauty of these plants. Instead of the one-sided cluster, the flowers aggregate in cylindrical clusters

Stiff Goldenrod (Solidago rigida)

which grow quite erect. Goldenrods in general are fine plants to find insects. The two commonest, perhaps, are the soldier beetle (yellow wings with black spots) and the black blister beetle (entirely black). These are often found feeding in the flower clusters.

❀ **Broad-Leaved Goldenrod** *(Solidago flexicaulis)*
Composite Family (Compositae)

This illustrates still another variation in the genus. Here the flowers are borne in the axils of the large leaves. The stems tend to be angled and somewhat zigzag. This is a plant of calcareous woodland (often where rocky). Its most consistent associate is the beautiful Short's aster *(Aster shortii)*. A word of caution—this goldenrod can become weedy and aggressive in the wildflower garden.

Broad-Leaved Goldenrod (Solidago flexicaulis)

John and Kitty Kohout

❀ **Ohio Goldenrod** *(Solidago ohioensis)*
Composite Family (Compositae)

The Chicago area is underlain with Niagaran dolomitic limestone. Where the effects of this reach the surface in the form of limy springs is where the lime-loving Ohio goldenrod is found. In this choice habitat other fine plants occur, including the low calamint *(Satureja arkansana)*, bog lobelia *(Lobelia kalmii)*, swamp thistle *(Cirsium muticum)*, and marsh betony *(Pedicularis lanceolata)*.

Ohio Goldenrod (Solidago ohioensis)

John and Kitty Kohout

❀ New England Aster *(Aster novae-angliae)*
Composite Family (Compositae)

This is one of the native wildflowers found featured in nursery catalogs. In addition to the violet-purple color, it is also found in a beautiful rose-colored form. Examination of the upper part of the stem reveals an attractive set of glandular hairs. Also, the leaves clasp a portion of the stem rather than being attached in the typical manner.

Flat-Top Aster (Aster umbellatus) John and Kitty Kohout

❀ Flat-Top Aster *(Aster umbellatus)*
Composite Family (Compositae)

This plant is of interest to entomologists because it is the food plant for the Harris checkerspot butterfly. It grows in moist prairies, and especially in thickets in our dune area of Indiana. Some species of this large genus grow along creeks and undoubtedly inspired the lines in the poem "September," by Helen Hunt Jackson:

The sedges flaunt their harvest in every meadow nook,
And asters by the brookside make asters in the brook.

New England Aster (Aster novae-angliae)

❀ False Dragonhead *(Physostegia virginiana)*
Mint Family (Labiatae)

This prairie wildflower is showy enough to be included in nursery catalog listings. It is also called obedient plant, because (if the flower age is just right) you can turn the blossom upward, downward, or sideways, where it will remain, and then turn it back to its original position, where it will also remain.

False Dragonhead (Physostegia virginiana) John and Kitty Kohout

Small Fringed Gentian (Gentiana procera)

❀ **Fringed Gentian** (*Gentiana crinita*)
Gentian Family (Gentianaceae)

I can recall a trip on September 19, 1943, which I made to an area along the borders of Gary and Hammond in Indiana, and in that one morning seeing thousands and thousands of fringed gentians (one specimen had 80 blossoms!). The area is now largely built over, but this event will always remain indelible in my memory. William Cullen Bryant wrote concerning this beautiful plant:

Thou waitest late and comest alone,
When woods are bare and birds have flown,
And the shortening days portend
The aged year is near its end.

❀ **Small Fringed Gentian** (*Gentiana procera*)
Gentian Family (Gentianaceae)

This is a lime-loving species, often associating with the grass of Parnassus (which see) and the bog lobelia. This plant is very closely related to the gentian discussed above, and intermediate specimens can be found. Again, in the poem "September" cited above, we read:

The gentian's bluest fringes are curling in the sun,
In dusky pods the milkweed its hidden silk has spun.

❀ **Prairie Gentian** (*Gentiana puberula*)
Gentian Family (Gentianaceae)

Also known as *Gentiana puberulenta,* this beautiful flower is restricted to prairies with a history of fire. In my home town of Villa Park, Illinois, this was one of the first flowers I ever learned in walking through the adjacent prairie areas. John Curtis, writing in *The Vegetation of Wisconsin,* states that it is "by all odds the most beautiful member of this famed genus in Wisconsin and at its best compares favorably with the species from the high Himalayas that are so prized by rock gardeners."

Fringed Gentian (Gentiana crinita)

John and Kitty Kohout

Grass of Parnassus (Parnassia glauca)

Turtlehead (Chelone glabra)

❀ **Grass of Parnassus** *(Parnassia glauca)*
Saxifrage Family (Saxifragaceae)

The common name is misleading—it is not found on the Grecian Mount Parnassus, and it is not a grass. It blooms late, often in October, in limy springy areas, consistently associating with the bog lobelia. The petals possess greenish-gold veins, and the flowers have false stamens (or staminodia), which are divided into three parts but do not shed pollen. In addition, there are true stamens and a very interesting pistil in the center.

❀ **Turtlehead** *(Chelone glabra)*
Figwort Family (Scrophulariaceae)

Because the Chicago area is largely underlain with Niagaran dolomitic limestone, there are lots of springy areas with alkaline water. Some of these areas are called fens. In this type of habitat occurs this flower, which, with a little imagination, looks like the head of a turtle. Interestingly, the species in our area has flowers which are usually tipped with green, but the same species in the east often has pink tips to the flowers. Wherever this plant is found, look in the vicinity for the beautiful Baltimore butterfly.

❀ **Nodding Wild Onion** *(Allium cernuum)*
Lily Family (Liliaceae)

Legend has it that the Chicago River got its name from the Indian name for this plant, which apparently grew commonly in the area. It does have the strong odor similar to that of many cultivated vegetables in the genus *Allium*—leek, onion, garlic, shallot, Welsh onion, chives, etc. We have a number of local *Allium* species, including the rank-smelling wild leek, which plant is responsible for the "ramp" festivals in the Great [illegible] Mountains.

Nodding Wild Onion (Allium cernuum)

❀ **Ladies' Tresses** *(Spiranthes cernua)*
Orchid Family (Orchidaceae)

While most orchids bloom in our area in spring and summer, this is one that is often seen still flowering in autumn. In many areas it is also our commonest orchid, sometimes being observed in prairie remnants along railroad tracks. It is especially beautiful at the Illinois Beach State Park near Zion. See the April issue of the *Bulletin* for the locations of this park and some of our other interesting botanical areas.

Ladies' Tresses (Spiranthes cernua)

Slender Ladies' Tresses (Spiranthes lacera)

John and Kitty Kohout

John and Kitty Kohout

Winged Pigweed (Cycloloma atriplicifolium)

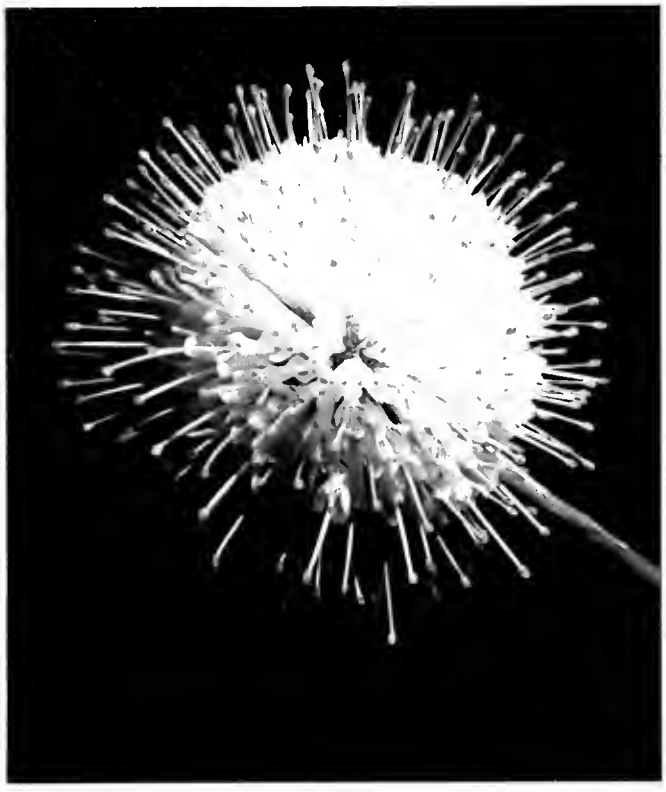
❀ **Slender Ladies' Tresses** *(Spiranthes lacera)*
Orchid Family (Orchidaceae)

A distinguished botanist has pointed out that these are ladies' tresses which happen to be slender, rather than tresses which belong to slender ladies. A glance at the photographs will show the marked difference between these two *Spiranthes* species.

❀ **Winged Pigweed** *(Cycloloma atriplicifolium)*
Goosefoot Family (Chenopodiaceae)

Out on the Great Plains, where tumbleweeds are common, there are great open spaces where tumbleweeds can travel for great distances. This introduction from the west has its movements quite limited here due to fences and many other barriers. However, it fulfills the tumbleweed image because of its globular shape and shallow root system. It is included here, however, primarily because of its beautiful autumn color. The plant can be best sought in the Hammond-Gary area of Indiana, in sandy areas of very recent disturbance. October 15 is an ideal date to see it at its best.

Buttonbush (Cephalanthus occidentalis)



❀ **Buttonbush** *(Cephalanthus occidentalis)*
Madder Family (Rubiaceae)

Normally an article of this type would consider only herbaceous plants, but the shrubby buttonbush has beautiful flowers in its own right. They are often called "honey-balls" because of the attractiveness of the white flower clusters to honeybees. The plant often dominates to the point where local areas are known as buttonbush marshes.

David M. Walsten

Cardinal Flower (Lobelia cardinalis)

❀ Cardinal Flower *(Lobelia cardinalis)*
Lobelia Family (Lobeliaceae)

This is one of the most brilliant wildflowers of America. A color-film photo cannot really do justice to the shining brilliance of this red flower. A good place to look for it is in late summer, in the Kankakee River valley of northern Indiana, where many drainage ditches have been constructed along the roads; the plant delights to grow in these ditches.

❀ Orange Fringed Orchid *(Habenaria ciliaris)*
Orchid Family (Orchidaceae)

It would be hard to find a native wildflower more bizarre (and e beautiful) than this plant. Its brilliant orange blossoms le witches' heads to a remarkable degree. Pepoon, in his *Flora of the Chicago Region,* alluded to this fact with pictures and text on pages 235, 236, and 237. Unfortunately, the plant is now extremely rare in the Chicago region; it reaches its peak of bloom the first week of August.

Literary-minded readers will want the other verses of Helen Hunt Jackson's poem "September":

The goldenrod is yellow, the corn is turning brown,
The trees in apple orchards with fruit are bending down.

From dewy lanes at morning the grapes' sweet odors rise,
At noon the roads all flutter with yellow butterflies.

By all these lovely tokens September days are here,
With summer's best of weather and autumn's best of cheer.

Orange-Fringed Orchid (Habenaria ciliaris)

Miner W. Bruce

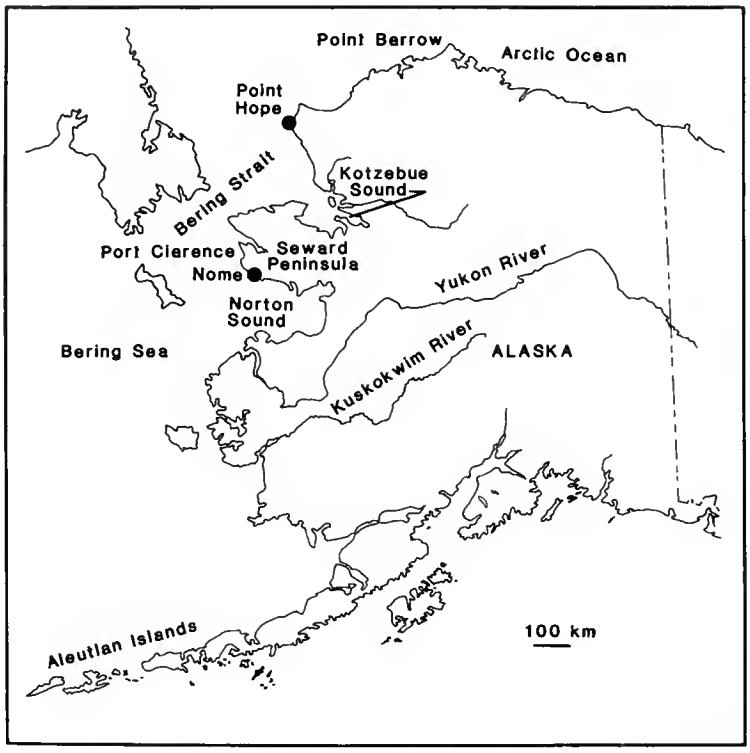
Reindeer Herder, Showman, and Collector For the Field Columbian Museum

by James W. VanStone
Curator of North American Archaeology and Ethnology

In 1892 DOMESTICATED REINDEER were brought from northeastern Siberia to the Port Clarence area on Seward Peninsula, Alaska (see map) through the joint efforts of the Rev. Sheldon Jackson, first General Agent of Education in Alaska and a Presbyterian missionary, and Captain Michael A. Healy of the U.S. Revenue Marine Service. This program, supported by the U.S. Bureau of Education, was intended to provide Alaskan Eskimos with a new source of food. During the second half of the nineteenth century, commercial interests had indulged in unrestricted killing of whales, walrus, and seals, so these traditional food sources had suffered a serious decline. There was also a small market for the meat and skins of the reindeer and it was hoped that the Eskimos could derive a cash income from their sale.

The first deer were landed by the U.S. Revenue

Reindeer herders at Port Clarence. The man at the right may be Miner Bruce. 17013



Rev. Sheldon Jackson

Cutter *Bear* in July, 1982 on the north shore of Port Clarence at a place which Jackson had named the Teller Reindeer Station after Henry M. Teller. A U.S. senator, Teller had helped steer appropriations for the project through Congress. Chukchi herders were brought from Siberia to teach Eskimos the techniques of close herding and the proper methods of caring for the animals.

At the opening of the station, Miner W. Bruce, a former journalist from Nebraska, was appointed superintendent. He and one assistant had charge of four Chukchi herders, an equal number of Eskimo apprentices, and approximately 175 deer. The two men were also expected to double as schoolteachers. Bruce's job was a formidable one since he had no training for either position and his inability to speak either the Eskimo or Chukchi language made communication with those he was supposed to teach extremely difficult and uncertain.

Bruce's first annual report to Jackson seems to indicate that the initial year went smoothly enough and all concerned learned a great deal about the care and maintenance of reindeer. Apparently, however, the superintendent, who had been recommended for the job by Healy, did not get along well with him. Therefore, Healy made the accusation that Bruce, through the captain of a chartered ship sent to the coast of Siberia to obtain deer, had traded five gallons of whiskey for some animals in July, 1893 at the beginning of the second season. Although these charges were denied, Healy was successful in persuading Jackson to fire both Bruce and his assistant.

Bruce had made matters worse for himself by taking 11 Port Clarence Eskimos and a collection of sleds, dogs, kayaks, and other artifacts to Chicago for exhibition at the World's Columbian Exposition in the summer of 1893. Healy wrote to Sheldon Jackson on July 30, 1893:

> Had I been in Port Clarence when [Bruce] left there I never would have allowed him to take those natives away, and I hope someone will be thoughtful enough to make him file a bond for their keep while away and to return them to their homes. To have the reindeer project become the father of a Dime Museum is to me a cause of mortification.

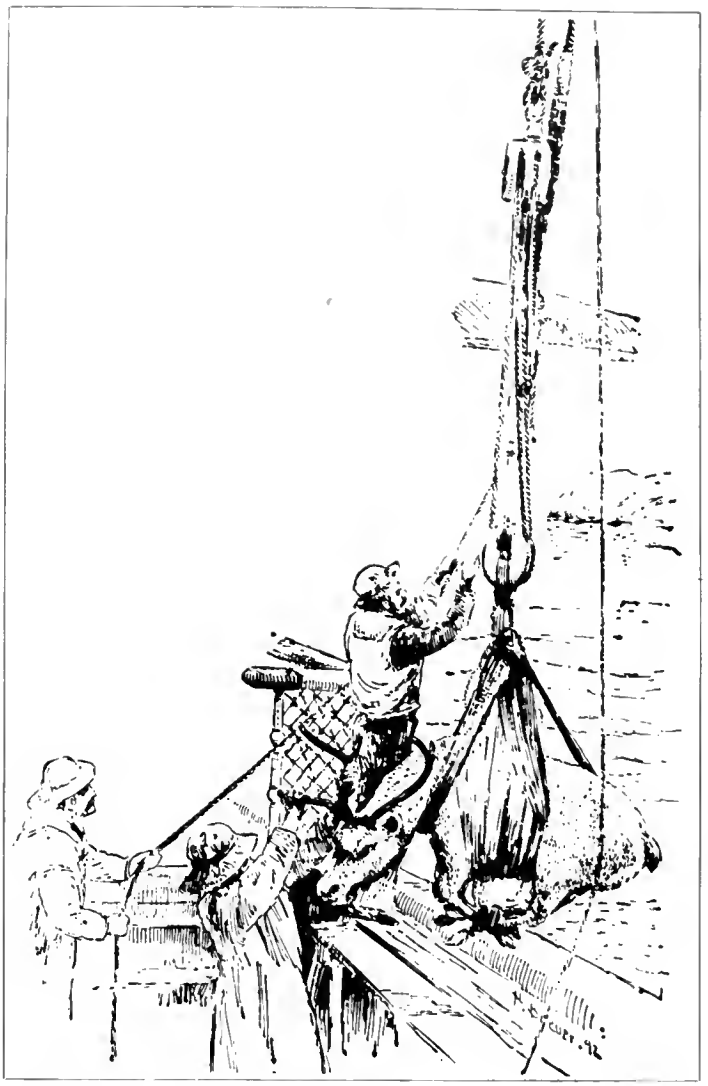
When the world's fair closed, Bruce took his collection and Eskimo entourage to New York City, where they performed for two weeks at Madison Square Garden, and to Washington, D.C., where they appeared before the House of Representatives, had tea at the White House with Mrs. Grover Cleveland, and were the object of considerable interest at the Smithsonian Institution.

The Field Columbian Museum, subsequently renamed Field Museum of Natural History, had been established in 1893 to house the natural history collec-

tions exhibited at the World's Columbian Exposition. Franz Boas was the first curator of anthropology, and F.J.V. Skiff the first director. Bruce called at the Museum early in 1894 before taking his Eskimo show on the road and, since Skiff was away, met with Boas. He offered to sell the Museum an ethnographic collection from Port Clarence. Boas considered the collection an excellent one and recommended it be purchased for the asking price, $550. The collection was acquired on October 31, 1894 and cataloged as accession 96.

Meanwhile, William H. Holmes had replaced Boas as curator, and on May 21, 1894, Holmes received a letter from Bruce indicating that the latter expected to sail from Puget Sound or San Francisco about June 10 for a second trip to Alaska. He hoped to spend some time on the Siberian shore before crossing the Bering Sea to Kotzebue Sound and perhaps proceeding as far north as Point Barrow. Bruce mentioned that he had written Boas about making a collection for the Museum and presumed that Skiff and Boas had conferred about the matter. He inquired if Holmes had made up his mind about what material he wanted.

Captain Michael A. Healy



Hoisting a reindeer aboard the Bear.

Less than a month later, apparently receiving no reply from Holmes, Bruce wrote directly to Skiff, expanding in some detail on his proposal to collect for the Museum.

> I propose chartering a sailing vessel for a four month cruise, stopping first at a point on the Siberian side near Bering Straits, following along the coast and into the interior, spending probably, two months in that territory, then, crossing over to the Alaska side and spending a month there, the ship returning to San Francisco and I remaining in the country, leaving a point near Port Clarence about the 1st of March and trading up the Yukon River, and coming out near Juno [sic] Alaska in the fall of 1895.
>
> I have examined your collection from the Arctic Country very closely and find that you have nothing from Siberia or the Interior of Arctic Alaska. All of this territory I propose to cover has not, as yet, been visited

with a view to making a collection and I believe I will be able to secure for you such a collection that will be prised [sic] by the Museum and a credit to myself.

I will furnish you with the collection if you will advance me a certain amount of money which I will invest in such goods as will be best adapted to trading for such articles as you want which sum shall be one third of the amount I am to receive, the balance to be paid to me when you receive my shipment. Or, in other words, I am to receive twice the amount I pay for the same.

I may, perhaps, be pardoned for suggesting that my knowledge of the Eskimo language and a pretty good knowledge of the country I expect to visit obtained from nearly five years traveling in Alaska pretty well equips me for the work.

Bruce exaggerated his Alaskan experience and gave little indication that he understood the problems of travel in the interior. Nevertheless, four days later, perhaps after some prodding by Skiff, Holmes informed the director that he considered the opportunity provided by Bruce's proposed trip to be a good one and went on to outline the type of material he desired: specifically, objects for "two museum groups, one illustrating the peoples of Arctic Siberia and the other those of Arctic North America."

As a result of this communication, Skiff wrote to Bruce with a formal proposal to retain the latter's services as a collector for the Field Columbian Museum.

Upon the recommendation of Prof. Holmes, Director of the Department of Anthropology, the Executive Committee of the Board of Trustees of this Museum has authorized me to enter into a contract with you as follows: You are to represent the Museum in the collection of certain objects, articles, and materials generally illustrating the peoples of Arctic Siberia and Arctic North America. For this purpose, the Museum remits to you herewith exchange for the sum of Five Hundred Dollars ($500), which amount you are to expend in the purchase of articles attractive and interesting to the tribes of the North, and which you will employ in exchange for those objects, articles, and services which constitute the result of your mission. Having secured such ethnological collections and material, the same is to be delivered into the possession of the Museum, and upon the receipt, examination and approval of the same by Prof. Holmes, the Museum will then pay you in cash or by exchange, the further sum of One Thousand Dollars ($1,000).

Four days later Holmes himself wrote to Bruce, noting that his approval to collect for the Museum had been approved and going on to provide Bruce with detailed instructions concerning the kinds of materials he desired the latter to obtain.

Two central ideas are to be kept in view: I wish to set up two Ethnic Groups, one representing the Eskimo of North Eastern Siberia and the other the Eskimos of Northern Alaska. they are intended primarily to illustrate the peoples. I hope you will observe the people as they live and act and group themselves so as to select some episode that will give a somewhat comprehensive idea of their appearance, character, habits, etc.

For the Siberian Group—supposing you select the one mentioned by me—there ought to be two mature reindeer and one young one, a man, a woman, one young girl, a young man or both, and two children. The costumes of all should be perfect and each should have about him such articles, utensils, weapons, playthings, pets, etc., as would be appropriate and tend to make the group interesting. The episode illustrated might be the departure for a journey, welcoming or saying farewell to a guest; the arrival of a hunter with game—a bear, seal or deer—on his sledge. We want enough of some animated scene to fill a case, say 10 x 16 feet in horizontal dimensions.

The Alaskan group should represent a different episode worked out in a similar way, a full team of dogs being necessary to the production of a striking presentation of the subject discussed here. We need especially photographs of groups and full figures as well as faces for detail. Nothing should be missing from harness or costume. Possibly a Kyak [sic] scene might be made effective.

Beside the material for these groups we want all that you may be able to get to illustrate the people and their arts and industries. Take such topics as the domestic arts, firemaking, wood and ivory-carving, hunting, fishing, skin dressing, basket-making, sewing, the toilet, etc. Perhaps I can set up the figure of a man making fire with a drill, a woman carrying her child, etc.

Full notes or a fully elaborated article ought to be furnished. Boats and sledges are always interesting.

Bruce was unable to reach Siberia because of bad weather, and, not surprisingly, he was also forced to abandon his proposed trip into the interior. It is clear that, having only limited experience in one location in Alaska, he greatly underestimated the distances he would have to travel to fulfill his original plan as well as the difficulties of obtaining transportation. It is not clear where Bruce spent the winter of 1894-95, but on November 16, 1894, he wrote Skiff indicating his intention of extending his collecting activities through the following summer. Presumably he expended much of the summer of 1894 attempting to reach the Siberian mainland.

It was a year before Skiff heard from Bruce again, but then he learned that a collection had been made for the Museum primarily, if not entirely, in the Kotzebue

Diorama in the old Hall 10 utilizing Eskimo artifacts and dogs collected by Miner Bruce. 73545

Sound region and that it was in storage in Atlanta. Bruce expected to use the artifacts in connection with another exhibition of Eskimos he had brought south with him and then deliver them to the Museum in Chicago. He also brought five dogs with him for the exhibit, and they were being held temporarily at the zoo in Washington, D.C. Bruce also spoke of organizing another trip the following year, at which time he would have "a ship of my own" and would visit northeastern Siberia. He seemed particularly anxious to justify his traveling exhibition to Skiff who, in fact, had expressed no particular interest in it.

> I suppose you know that my object in bringing the Eskimo to the United States was not for exhibition purposes but to assist me in my effort with the Congress to secure an appropriation for the purchase of reindeer in Siberia and bring them among our Eskimo, thus furnishing them food and clothing. Two years ago I was able to secure an appropriation for this purpose and I expect to be as successful this time.

It is noteworthy that Bruce makes no mention of Sheldon Jackson and obviously wished to leave the impression that the reindeer program was his own responsibility. Not surprisingly, perhaps, there is no mention anywhere in the Museum's correspondence with Bruce referring to his service as superintendent of the Teller Reindeer Station or to the fact that he was dismissed by Jackson.

Bruce believed that the collection he had made for Field Museum was an intergral part of his exhibition and hoped that Skiff would have no objections. None were raised, and through the winter and spring of 1896 the exhibition proceeded from Atlanta to Louisville and then to New Albany, Indiana, from which place Bruce expected to bring the collection to Chicago in early May, along with the five dogs that were to be installed in the new exhibit as proposed by Holmes (two of the dogs can still be seen in the Maritime Peoples hall).

The Kotzebue Sound collection was apparently received by Field Museum on May 6, 1896 (accession 259), and in a letter to Skiff written the same day, Bruce made excuses for his failure to collect in Siberia, stressing his intention of reaching that area during the coming summer. Concerning the collection he did make, however, he was extremely enthusiastic.

> In the matter of the collection made in Arctic Alaska which I have this day delivered to your Museum, I believe I am safe in saying it embraces a large number of articles and materials illustrating the people of that region and embraces many objects not heretofore obtained by you, and in number it is about four times greater than that which I turned over to your Museum in 1894.

Woman's summer parka made from skins of the ground squirrel; collected by Miner Bruce in Kotzebue Sound. 106614

Actually, the Kotzebue Sound collection is slightly less than twice as large as the one obtained at Port Clarence.

In spite of the collector's enthusiasm for his own collection, the Museum appears to have been less than completely satisfied. Holmes felt that he had received only about one-third of the artifacts necessary for his proposed exhibit, and he was particularly concerned about the absence of material from Siberia. Although he believed Bruce had done his best and "as much as any man could have done," the collection as received was worth "not more than half the sum mentioned in the original agreement." Since Bruce—who, it will be recalled, had already received an advance of $500—proposed another expedition to secure the rest of the material agreed upon, Holmes recommended a second advance of $500, with the remaining $500 to be paid when the agreement was fulfilled to the Museum's satisfaction. The director agreed to this arrangement and informed Bruce.

Miner Bruce returned in the summers of 1896 and 1897 to Alaska, where he made collections for the Smithsonian Institution, the Carnegie Museum of Natural History in Pittsburgh, and perhaps other institutions. There was no further correspondence with Field Museum for almost two years. Meanwhile, Holmes resigned the curatorship in late 1896, and his successor was George A. Dorsey, who had been appointed assistant curator the previous year. In 1897 Bruce made another collection for the Museum consisting of approximately 200 items from various locations in Alaska and Siberia (accession 546), which Dorsey considered to be "of great ethnological interest." In addition, he provided Eskimos who served as models for plaster molds sufficient for seven manikins and helped Dorsey identify many objects in the Museum's Eskimo collections. For these services, Dorsey recommended that Bruce be paid the remaining $500 called for in the old contract, a recommendation the Museum's administration approved. FM

NOTE

This article is adapted from J. VanStone, "The Bruce Collection of Eskimo Material Culture from Port Clarence, Alaska," *Fieldiana: Anthropology*, vol. 67, 1976 and "The Bruce Collection of Eskimo Material Culture from Kotzebue Sound, Alaska," *Fieldiana: Anthropology*, new series no. 1, 1980. Most of the information was obtained from the archives and correspondence files of the Department of Anthropology. For additional details concerning the importation of domesticated reindeer to Alaska from Siberia, see D.J. Ray, *The Eskimos of Bering Strait, 1650-1898*, University of Washington Press, 1975.

Tours for Members

English Homes and Country Tour

July 1—15

price $2,725 (double occupancy)

The "treasure houses" of Britain are best experienced within their architectural context and amidst their natural landscapes. Here we travel the paths of history and culture in the most immediate sense. But unlike most tours that rush you around for a cursory introduction, Field Museum is offering the discriminating traveler an opportunity to get to the heart of the English people and live in the English countryside as they do. The English are a thoroughly hospitable people, making you feel truly welcome as they take you into their comfortable homes as a guest of special importance. Past travelers have made lasting friendships with their hosts, returning again and again, even reciprocating the welcome as their English friends visited here. This view of a remarkable country is rare indeed, and especially relaxing since you stay several days in one home instead of spending your time on a bus. We stay in the south-eastern counties where charming thatched villages complement vast cathedrals and living hedgerows set off lush royal gardens. Your hosts and hostesses include baronets, generals, company directors, doctors, members of Parliament, and landowners. Their homes range from mansions to more modest yet extremely comfortable cottages. Accommodations include use of a private bathroom.

Come and visit this 'tied to the past' yet forward-looking and charming country. Inquire into the customs and foibles of the people as you tour with not only a local guide, but with a scholar from Field Museum, who was born and raised in this remarkable country. Dr. Peter Crane got his Ph.D. in botany at the University of Reading. He is an associate curator in the Department of Geology at Field Museum and was recognized as one of ten "Outstanding Young Citizens" by the Chicago Junior Association of Commerce and Industry in 1985. He is excited about this unusual travel opportunity in his native country and invites you to join him and his countrymen in an exploration of English Homes and Country.

July 1. Depart Chicago O'Hare for Heathrow.

July 2. Arrive Heathrow. Met by tour director; board luxury coach for drive to Canterbury. Meet hostesses and drive to their homes to unpack and freshen up before lunch. At leisure for the rest of the day. In the evening dinner with hostesses.

July 3. Canterbury. A day in and around Canterbury. First a tour of the cathedral personally introduced by a canon from the cathedral staff, followed by a wander in Canterbury before lunch. After lunch further time to wander in Canterbury before visiting the village of Fordwich, which has the oldest town hall in England. Dinner in a private house.

July 4. South Kent. Drive south to the Cinque Port of Rye with its steep cobbled streets and period houses, and the world famous Mermaid Pub. A short drive to Bodiam Castle, built in 1386 to defend the Rother Valley from incursions by the French, followed by lunch at the Castle Pub. Another short drive to Great Dixter, a house built about 1450 (not long after Chaucer) and which now has a lovely garden containing a wide variety of unusual and interesting plants. Dinner in a private house.

July 5. Mid-Kent. After breakfast a leisurely drive to Leeds Castle for a private tour of what was described by Lord Conway as the "loveliest castle in the world." On through typical Kent countryside to Sissinghurst Castle, with its well-known and very beautiful garden. After lunch in the Castle restaurant, a short drive to Godinton Park for a private visit to this mansion with its fine Stuart panelling, carving, and magnificent furniture and porcelain. Dinner with hostesses.

July 6. Travel To Cambridge. Goodbye to the Canterbury hostesses. A short drive to the great Norman cathedral at Rochester in the heart of Dickens country where those who wish may attend a service. Then by tunnel under the River Thames northward into the county of Essex for lunch in a Tudor pub. After lunch a drive through the changing East Anglian countryside to meet and dine with Cambridge hostesses.

July 7. Suffolk. A day in Suffolk countryside immortalized by artist John Constable. First to Newmarket, home of the Sport of Kings, and center of the racing industry for a private tour of the Gallops, Tattersalls Selling Ring and Jockey Club for sherry. Lunch in Newmarket before driving to the medieval town of Bury St. Edmunds with its beautiful cathedral. In the late afternoon a short drive to Lavenham with time to explore the Guildhall dating from the 1520s, and the most splendid of all "Wool" churches before dining in one of the oldest buildings in Lavenham, the famous Swan Hotel.

July 8. Cambridge. A day in and around Cambridge, first visiting historic colleges and churches including Kings College Chapel, followed by a visit to the American Military Cemetery at Madingley which commemorates those Americans who died in northwest Europe in World War II. Lunch at a private house close to Cambridge. The afternoon in Cambridge exploring the city before dining with hostesses.

July 9. Travel To Chichester. After bidding farewell to Cambridge hostesses a drive south to West Sussex bypassing London to the west, and stopping for a pub lunch on the way. In the afternoon visit the Royal Horticultural Society Gardens at Wisley. These world-famous gardens contain an extraordinary collection of plants, flowers, trees, and shrubs, and attract visits by horticulturists from all over the world. A further journey to meet and later dine with hostesses.

July 10. Chichester. First to Bosham to visit Trinity Church of King Canute fame before going to Chichester for a stroll through the Pallants to the Hospice of St. Mary, then lunch in the Dolphin and Anchor. A Private tour of the Cathedral and free time to explore before having supper at the Festival Theatre Restaurant and attending a performance at the theatre.

July 11. Winchester. A drive west, skirting Portsmouth and Southampton, to Broadlands, home of the late Lord Mountbatten. A short drive to Winchester for lunch in the

Wessex Hotel before visiting the cathedral and wandering in its environs. Return to Chichester through the rolling countryside of West Sussex. Dinner with Hostesses.

July 12. Mid-Sussex. Visit Boxgrove Priory which dates from the 12th century. A short drive to the thatched village of Amberley which nestles at the foot of the Downs. A pub lunch. Then to Petworth, a magnificent late 17th-century house which includes among its treasures works by Van Dyke and Turner, and a Grinling Gibbons room. A private dinner at Goodwood House followed by a tour of this historic home of the Dukes of Richmond and Gordon.

July 13. Travel to London. Goodbye to Chichester hostesses, and drive to London for an orientation tour through the West End and City before arriving at the Mandeville Hotel and settling in there before lunch. Free afternoon and evening.

July 14. London. Free day and evening in London. The booklet on London in the personal folders given to each guest on arrival in England lists places of interest, how to get there and times of opening. A private tour of the Palace of Westminster, provided the Houses of Parliament are not in recess, will be arranged for those who wish.

July 15. Tour Ends. Those returning home will be escorted to London Heathrow by our tour director. Arrive Chicago O'Hare.

Alaska

$4,885
July 2-16

Experience the Great Land. Descriptions of Alaska are filled with superlatives—a state more than twice the size of Texas with a population less than that of Denver, 33,000 miles of coastline, 119 million acres of forest, 14 of the highest peaks in the United States culminating in Mt. Denali (formerly Mt. McKinley), at 20,320 feet.

Our travels will be by plane, train, bus, boat, and foot—whatever best enhances our experience. Emphasis will be on the land, its history, its wildlife. Interpretation combined with direct observation will provide an enjoyment and quality of experience unavailable to the casual visitor. Whatever your interest in natural history—marine mammals, birding, mountains, photography, flowers, forests, glaciers, rivers—this tour will show you Alaska in all its diversity and splendor.

Dr. David Willard, manager of Field Museum's bird and mammal collections, will be tour leader. He received his Ph.D. in Biology at Princeton University, where he was acting curator of Princeton Museum of Ornithology. He has been on a number of research expeditions for Field Museum.

July 2. Fly Chicago to Sitka; welcome dinner; overnight Sitka Sheffield Hotel.

July 3. Breakfast at hotel; morning city tour with stop at Raptor Center; lunch; late afternoon marine wildlife trip on private yacht *Taku Queen;* weather permitting, cruise to St. Lazaria National Wildlife Refuge; dinner on board; overnight Sitka Sheffield Hotel.

July 4. Breakfast at hotel; morning flight to Juneau; Mendenhall River Float Trip with lunch along the river; tour Mendenhall Wetlands; late afternoon options available: flightseeing, helicopter onto Mendenhall Glacier or a guided hike; evening outdoor salmon bake; overnight Sheffield Hotel Juneau.

July 5. Breakfast at hotel; morning flight to Glacier Bay; Glacier Bay cruise aboard the MV *Glacier Bay Explorer;* overnight on board the *Explorer;* lunch and dinner on board *Explorer.*

July 6. Cruising Glacier Bay in morning; return to Glacier Bay Lodge for lunch; afternoon flight to Juneau and on to Fairbanks. Dinner and overnight at Fairbanks Inn.

July 7. Breakfast at hotel; Alaska Railroad to Denali National Park; lunch at the Park entrance; afternoon free to see park service exhibits, slide shows and films; salmon bake dinner; overnight McKinley Chalets.

July 8. Early morning breakfast at the chalets; 6 a.m. departure by private bus through Denali National Park for wildlife viewing; arrive Kantishna Roadhouse and Bushcamp for lunch; tour of Kantishna by local homesteaders; wildlife tour exiting the park; return to chalets in early evening for dinner and overnight.

July 9. Breakfast and lunch at the chalets; chance to sleep in after long prior day; afternoon Alaska Railroad to Anchorage; dinner and overnight Sheraton Hotel.

July 10. Breakfast at hotel; late morning departure for Potters Marsh birding and on to Portage Glacier; Portage River Float Trip; lunch at the Portage Glacier Lodge; return to Anchorage for overnight at the Sheraton.

July 11. Breakfast and lunch on own; morning free for optional activities, shopping, visit to the museum, etc.; afternoon Eagle River Float Trip with dinner and fireworks along the river; overnight Sheraton.

July 12. Breakfast at the hotel; fly Anchorage to St. George Island, with lunch en route; dinner and overnight at St. George Hotel.

July 13, 14. At St. George rookeries; breakfast and dinner at the hotel; lunch in the field. An evening gathering in the home of one of the Aleut community leaders.

July 15. Breakfast at St. George Hotel; fly St. George to Anchorage, arriving late afternoon; final group dinner and slide show; overnight Sheraton Hotel.

July 16. Breakfast at hotel; fly Anchorage to Chicago.

For reservations, call or write Dorothy Roder (322-8862), Tours Manager, Field Museum, Roosevelt Rd. at Lake Shore Dr., Chicago, Il 60605

Field Museum of Natural History
Membership Department
Roosevelt Road at Lake Shore Drive
Chicago, IL 60605-2499

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FIELD MUSEUM OF NATURAL HISTORY BULLETIN

September 1986

Music for Homemade Instruments
September 20, 21

Steven Ivcich, the Fantastic Mime
September 27

See pages 3, 4

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of Natural History
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CONTENTS

September 1986
Volume 57, Number 8

COVER

Indiana Dunes State Park, little more than an hour from Chicago's Loop by train, is a superb hiking area for naturalists. Lush deciduous and evergreen forests, bogs, dune-land, and a breathtaking sweep of sandy beach are to be found in this well-maintained park along Lake Michigan's southern tip. Photo by Dave Walsten.

Field Museum offers three different environmental field trips this fall to the Indiana Dunes. Check your Fall Field Trip brochure for trip descriptions and dates, or call (312) 322-8855 for more information.

VOLUNTEER OPPORTUNITY

Do you find fossils fascinating? Are you interested in invertebrates? Or is plant care more pleasing? If you can give one day a week for a year, you can expand your knowledge and share your skills as a volunteer in one of Field Museum's "behind-the-scenes" departments. Are you more of a "people" person? Our Education volunteers help schoolchildren and the general public learn about natural history through tours and programs. Weekend Education volunteers give two weekend days per month. For more information, please contact Ellen Zebrun, Volunteer Coordinator, at (312) 922-9410, extension 360.

Field Museum of Natural History Bulletin (USPS 898-940) is published monthly, except combined July/August issue, by Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, Chicago, IL 60605-2496. Subscriptions: $6.00 annually, $3.00 for schools. Museum membership includes *Bulletin* subscription. Opinions expressed by authors are their own and do not necessarily reflect the policy of Field Museum. Unsolicited manuscripts are welcome. Museum phone: (312) 922-9410. Notification of address change should include address label and be sent to Membership Department. Postmaster: Please send form 3579 to Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, Chicago, IL 60605-2496.
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September 27, 1:00-3:00 pm

Explore the world at the tip of your nose. Smell your way through a display of fragrant plants. Play a "smelly" game using only your sense of smell to identify hidden objects. Discover why some animals have such unusual noses and make a distinctive animal nose to wear home.

—communication through body movements and facial expressions. Through your sense of sight explore all the senses with "Mr. Blank," one of the characters you will meet through mime Steven Ivcich. Learn to create the mime illusions of "the wall," "leaning on a fence," and "pulling a rope."

Steven Ivcich is presented through Young Audiences of Chicago.

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Events

Come to Your Senses Weekends in September

A month-long celebration of your senses. Each week a different sense is explored through performance, demonstration, and participatory activities. Call (312) 322-8854 for details. All activities are free with Museum admission.

Eye-See

Saturday, Sept. 6, 2:00 pm
Stanley Field Hall

What is our most important organ for finding out about the world around us?—our eyes! Discover how humans see using color, line, pattern, shape, and form. Find out how many different kinds of animals see and make your own color spectrum with giant bubbles.

Please Touch!

Saturday, Sept. 13, 1:00–3:00 pm
Stanley Field Hall

How often have you longed to touch the skin of an elephant or feel the petal of an orchid? Elegant Indian beadwork takes on a whole new meaning when you have the opportunity to explore the object with your hands. Spend some time going around the Museum and visiting some of our touchable objects. Then using sandpaper, velvet, styrofoam, and other interesting textured materials, create your own tactile object that feels as good as it looks.

Now You Hear It, Now You Don't

Saturday, Sept. 20, 2:00 pm
Stanley Field Hall

"Peter Piper picked a peck of pickled peppers. . . " Enjoy children's tongue twisters, riddles, and limericks; find out about melody, timbre, and rhythm. Make your own rhythm blocks, chimes, or *shekere*.

The Nose Knows

September 27, 1:00–3:00 pm

Explore the world at the tip of your nose. Smell your way through a display of fragrant plants. Play a "smelly" game using only your sense of smell to identify hidden objects. Discover why some animals have such unusual noses and make a distinctive animal nose to wear home.

Steven Ivcich, Mime

September 27, 2:00 pm
Stanley Field Hall

Enjoy the silent and imaginative art form of miming —communication through body movements and facial expressions. Through your sense of sight explore all the senses with "Mr. Blank," one of the characters you will meet through mime Steven Ivcich. Learn to create the mime illusions of "the wall," "leaning on a fence," and "pulling a rope."

Steven Ivcich is presented through Young Audiences of Chicago.

CONTINUED →

Events

World Music Program

Saturdays and Sundays in September

Music communicates many different things to many different people. It is something that can be shared by all of us, whether or not we have common lifestyles, beliefs, or even languages. From the rhythmic sounds of the talking drum to the melodic strains of the shakuhachi flute, experience with us the music of Africa, Japan, India, and China.

The World Music Program is supported by Kenneth and Harle Montgomery in honor of E. Leland Webber, president emeritus of Field Museum.

Family Feature

Food Prints

September 27 and 28, 1:00-3:00 pm

Shiny red apples, bright oranges, and deep purple eggplants look beautiful in still life paintings. Cut these fruits and vegetables in half and find a whole new beauty. Roll an orange covered in purple paint across a page and see the design it leaves. Cut it open and create a different picture from the same piece of fruit. Using a garden full of artist's materials, print a picture that looks good enough to eat.

Music For Homemade Instruments Mini Concert and Street Fair

Saturday and Sunday, Sept. 20 and 21, 3:00 pm
Stanley Field Hall

Music for Homemade Instruments is an ensemble of classically trained musicians who invent, build, compose for and perform on musical instruments made of trash and found objects. Their collection of over 150 instruments features mupejas (multiple peanut butter jars), legimbas (table leg marimbas), cloud chamber bowls (tuned gallon wine jugs), test tube pan pipes, boiler pan gongs, fork wind chimes, the bowery phone (tuned pint bottles), and the teflona-fun (a set of cooking pots). Join us for two days of action-packed musical experience. This exciting and inventive group of musicians assemble and play a world of new and unusual instruments. After their performance, families are invited to take part in group concert—"Audience Oratorio."

September Weekend Programs

Each Saturday and Sunday you are invited to explore the world of natural history at Field Museum. Free tours, demonstrations, and films related to ongoing exhibits at the Museum are designed for families and adults. Listed below are only a few of the numerous activities each weekend. Check the *Weekend Programs* sheet upon arrival for the complete schedule and program locations. The programs are partially supported by a grant from the Illinois Arts Council.

September

6 1:30pm. *Himalayan Journey* (slide lecture). See Bhutan, "Land of the Thunder Dragon."

13 11:30am. *Ancient Egypt* (tour). Explore the traditions of ancient Egypt from everyday life to myths and mummies.

12:30pm. *Museum Safari* (tour). Seek out big game from Africa and mummies from ancient Egypt as you travel through Field Museum exhibits.

14 2:00pm. *Malvina Hoffman: Portraits in Bronze* (slide lecture). Examine the life and works of Malvina Hoffman, concentrating on the Portraits of Mankind collection commissioned by Field Museum.

20 12:30pm. *Museum Safari* (tour). Seek out big game from Africa and mummies from ancient Egypt as you travel through Field Museum exhibits.

27 12:20pm. *A Walk with China's Animals* (tour). Meet Su Lin, the panda, and other real and imaginary beasts through Field Museum exhibits.

28 12:30pm. *Treasures from the Totem Forest* (tour). A walk through Museum exhibits introduces the Indians of southeast Alaska and British Columbia, their totem poles and masks.

These programs are free with Museum admission and no tickets are required.

DISCOVERING CHICAGO'S DIALECTS

A Field Museum Experiment in Adult Education

by Michael I. Miller

Writing in 1904, an eminent University of Chicago linguist, Professor Carl Darling Buck, described Chicago as "an unparalleled babel," whose linguistic diversity surpassed other American immigrant centers such as New York and transcended even the Byzantine variety of ancient and great cultural crossroads — like Constantinople itself.

The fact that forty languages were spoken in Chicago did not make it unique in America, but that fourteen of those languages were spoken by more than 10,000 persons each was unprecedented in the history of human civilization. The Chicago of 1904 supported daily and weekly newspapers in at least ten languages and regularly provided church services in at least twenty. Though multilingualism and multidialectism are commonplace facts of urbanism — no doubt constants of urban life since the earliest cities appeared in Mesopotamia—no other civilized place had harbored such a broad variety of tongues on such a large scale.

If this were not enough to make Chicago's speech interesting to linguists, we confront the parallel and apparently contradictory fact that English as spoken here has become a kind of *de facto* American national standard, partly because it forms the basis for the "network standard" heard on radio and TV. Since this may be horrifyingly true to graduates of Oxbridge and to genteel Londoners, it seems worthwhile to ask about the effects on our language of over a century of constant immigration.

What changes have been brought by urbanization, technological change, and marketing to the traditional folk dialects we would expect to find transported here from New England (and ultimately from England itself)? What Chicago localisms — Chicagoanisms — have developed over the last 150 years of European settlement at the southwestern end of Lake Michigan? To what extent have loanwords, loanshifts (words whose meaning has changed under the influence of another language) and loanblends (word hybrids) taken root in Chicago's urban culture? What has been the influence of Southern and South Midland immigrants, particularly Southern blacks and Appalachian whites? What have been the effects of mass education — itself an unprecedented social experiment from a European point of view? What are the continuing effects of social stratification and of other forms of social organization, such as national parishes or red-lined housing areas? Most importantly, what dynamic changes continue to develop in Chicago's speech?

The Checklist Technique

"Discovering Chicago's Dialects," a creative experiment in adult education sponsored by the Field Museum, engaged fifteen Chicagoans in attempts at answering these and similar questions. We did not find all the answers we sought; but most of us felt that the search itself was worth our time and effort.

The course began with a brief overview of Chicago's settlement history and a thumbnail sketch of the materials and methods of dialectology as an academic discipline, beginning with the very first scientific attempts at dialect collection along the Rhine River in western Germany in 1876. This part of the course was considerably enriched by the contributions of Virginia McDavid, a former fieldworker for the Linguistic Atlas of the United States and Canada. Then we set to work on a concentrated study of Chicago's vocabulary and pronunciation, using a checklist technique pioneered by Alva M. Davis, formerly of the Illinois Institute of Technology, and following out several lines of investigation suggested by the brilliant work of Lee Pederson, conducted here between 1964 and 1966.

Though course participants drew heavily on previ-

Dr. Miller is assistant professor, Department of English and Speech, Chicago State University, and has been an instructor for Field Museum's Adult Education Program.

ous scholarly work, we did not confine ourselves to a study of lifeless documents. Instead, we used five or six different checklists to explore the language of our families, friends, co-workers, and anyone else we could get to cooperate. As this implies, we did not attempt a replicable sociolinguistic sampling of Chicago speech. Our results nevertheless suggest some features of Chicago's language that a more scientific sampling survey might look for—and find. For readers who would like to try it out on themselves, one of our checklists is reproduced on page 8.

Chicago's Dialectical Structure

A map created by Roger Shuy, author of *The Northern-Midland Dialect Boundary in Illinois* (1962), indicates the major dialect boundary that runs through northern Illinois, a relatively sharp and stable Northern-North Midland *isogloss bundle.* An isogloss bundle is an imaginary geographical line where the dialect boundaries formed by individual words, pronunciations, and grammatical usages run more or less parallel, though in real life they always intertwine like strands of spaghetti.

Shuy worked from detailed field records of pronunciation, grammar, and vocabulary of carefully selected, long-time residents of northern Illinois. He concluded that "we have a major dialect division in northern Illinois which clearly marks off the Lead Region [around Galena] and southern half of our area as Midland and the northeast quadrant of our territory as Northern.... Our dialect boundaries in northern Illinois correspond roughly to the area bounded to the west by the Rock River and to the south by the east-west flow of the Illinois River." Chicago sits squarely in the northeast quadrant of Shuy's map. And since most of Chicago's first English-speaking settlers came from New England and New York, we would expect to find more distinctive features in common with New York City than with, say, Philadelphia or Atlanta.

Within the city, the Chicago River presents Chicago's most distinctive physical feature, bisecting the area north of the Loop and then fanning out in northern and southern branches. This shape determines Chicago's social and cultural geography. The Irish workers attracted here to dig the Illinois-Michigan canal settled east of the south branch and established the basis for both the speech and the political traditions of Bridgeport, home turf of the Daley clan. Germans tended to settle east of the north branch, where they cultivated the language known as "Lincoln Avenue Dutch" throughout the nineteenth and early twentieth centuries, and the later Poles, Italians, Bohemians, and other ethnic groups generally fanned out west of the two river branches. Chicago's language, which began from the same linguistic base as Boston's and New York's, differs from the speech of the East today because of the immigration patterns begun in the 1840s and shaped by the river.

Three major population groups comprise present-day Chicago: blacks, Hispanics, and the descendants of the earlier European immigrants. Blacks have brought various forms of Southern speech to the south and west sides. Hispanics have brought Mexican Spanish to settlements along the south branch of the river and Puerto Rican Spanish to settlements along the north branch. Since the nineteenth century, the European populations have steadily migrated northwest and southwest, following the paths of old Indian trails that later became avenues like Lincoln, Milwaukee, Ogden, and Archer. As a result of this constant population movement and neighborhood resettlement, distinctive neighborhood dialects have not developed on a large scale. There are, however, conservative, long-established neighborhoods and parishes with distinctive speech forms, such as Alderman Edward Vrdolyak's Tenth Ward. On the other hand, the influences of Southern black and white speech and of Spanish tend to break up the essential unity of Chicago's speech roughly along the geographical lines established by the river and creating the social and ethnic organization of the city.

New England Sources

New England nevertheless remains the essential starting point of Chicago's speech. We might think, for example, that urbanization would cause traditional New England farming terms to disappear, but the evidence doesn't always bear out this assumption. One semantic field, or area of meaning, that we investigated is represented by the characteristic Yankee word for a small collection of hay in the field, *hay cock.* We found that *hay cock* survives vigorously in Chicago use, even though few of us have occasion to gather, or even see, hay. However, many Chicagoans replace the traditional word with an ad hoc urban innovation, *hay pile.* Other Chicagoans use the Southern term, *hay shock.* Still others, probably because their acquaintance with farming activities is slight, mistake the small collections made before baling with a *bale* itself. Since none of these variants were suggested by the question itself and seem unlikely to be learned in school, they must survive through word-of-mouth transmission, through the generations. Interestingly, some Chicagoans use the word *rick* for a small

collection of hay, a word more commonly applied to the rectangular hay stacks of the upper Chesapeake Bay and inland parts of Virginia.

In any case, we found a process of innovation and replacement rather than loss. This leads not to a disappearance of the traditional folk vocabulary but to a phenomenon perhaps better called *urban fragmentation.* Urban fragmentation can be observed for many different kinds of farm terms. For example, the traditional Northern-North Midland distinction between *stone wall* (New England) and *stone fence* (Pennsylvania) for a fence built of loose stones gets fragmented in Chicago use to include *cobble fence, cobblestone fence, brick wall, barrier, drywall fence, rock fence, rock abutment,* and *rubble.* A shelter for hogs and pigs in Chicago usage is known not only with the traditional eastern New England terms *sty* and *pig sty* but also by terms imported from elsewhere and still others apparently invented on the spot, like *pig pen, hog shed, hog barn, pig barn, barn pen, hog pen,* and even *hog stable,* which is perhaps a calque, or loan translation, from German *Schweinestall.*

Though we found no convincing proof, our study group speculated that *pig sty* is relatively stable in Chicago because it has become an element of urban folk culture and vocabulary. Several participants, for example, found that *pig sty* appears as a term of reproach—"Your room looks like a pig sty!"—by urban mothers who had never seen a live pig, much less a sty.

Words like these helped us identify at least three ways in which urbanization affects the farm vocabulary: innovation, as in *hay pile;* lexical importation, as in *rick* or *shock;* and semantic shift or transference, as in *bale* or *sty.* All of these processes produce the types of urban fragmentation we often observed and prevent the obsolescence of rural terms that naive observers might expect. This does not mean that rural words never disappear. For example, when asked how to call a cow, most Chicagoans simply don't know. And those who think they do know tend to come up with probably ineffective tries like "hey, cow!"

Technological Change

Technological change, on the other hand, with or without urbanization, effectively makes words obsolete. *Dashboard,* for example, is a word that has survived but with completely changed meaning due to technological change. And during the course, Mrs. McDavid observed that Henry Ford probably had more to do with breaking down dialect barriers than any other single individual in American history. Mass-produced cars of course promoted transportation across dialect barriers. But even more importantly, the language of horse-drawn machinery and transportation is no longer the reliable index of dialect differences that it was as recently as two generations ago.

When asked what they would call a crossbar on a wagon for an individual draft animal—an everyday, indeed indispensable feature of urban life in 1904—only eight of about one hundred people ventured any response at all, and several of these responses were nonce formations; that is, words that occurred only once and were apparently invented on the spot. But the *whippletree* or *whiffletree* was such a common object in the horse-drawn days of living memory that Einar Haugen, a famous scholar of bilingualism, observed the word used in common interlingual jokes in daily newspapers as recently as World War II. Similarly, however, the parallel harness poles on a buggy, called *shafts, fills,* or *thills* in older usage, are virtually without a name in current Chicago speech. The thick sour milk that used to be called *clabber* has all but disappeared due to changes in milk-processing. These instances of lexical obsolescence, sometimes sudden lexical obsolescence, are all due to technological change, not urbanization as such.

Trade

Sociologist-economist Max Weber's famous dictum that "the city is a market" also applies to urban vocabulary. The classic example in the Midwest is the word for cheese made with curds from sour milk, discussed in detail by the editor of the *Linguistic Atlas of the Upper Midwest,* Professor Harold B. Allen. In Chicago, Lee Pederson found several words borrowed from other languages, such as German *Schmierkäse,* Czech *smetlak,* and even a Swiss-German dialectal form *Bibelikäse.* But in our pilot study, we found that 98 percent of those we interviewed used *cottage cheese,* a word that began its life in American English as a Northern dialectical form but has become "standard" in cities. This happened partly because technological change has rendered obsolete the need to make cottage cheese in the home. But why has *cottage cheese* become the dominant term rather than the equally plausible and historic British term *curds?* Why don't we use other Americanisms such as *Dutch cheese, pot cheese,* or even *smearcase?* The answer seems to be that the large dairy firms responsible for packaging, distributing, and marketing the product happened to adopt this particular variant. *Cottage cheese* is thus a trade word, like *xerox* when used as a verb meaning "copy."

A similar process has influenced the adoption of northern *kerosene* over midland and southern *coal oil.*

Preliminary Chicago Checklist

The Regional Vocabulary

DIRECTIONS:

1. Please put a circle around the word in each group you ordinarily use.
2. If you ordinarily use more than one word in a group, put a circle around each of the words you use.
3. Don't put a circle around any word you don't actually use, even though you may be familiar with it.
4. If the word you ordinarily use is not listed in the group, please write it in the space below the item.
5. If you never use any word in the group, because you never need to refer to the thing described, don't mark the word.
6. The material in italics is explanatory only.

Example: *Town Officer:* alderman, selectman, trustee, councilman.

1. *Small front porch:* porch, front porch, stoop, step, front steps, landing.
2. *Protective boarded covering on the sides (not the roof) of a house:* clapboards, siding, shingles, facerboards, brick siding.
3. *Suspended, or built-in horizontal open piping for draining rain from a roof:* eaves trough, gutters, drain pipe, rain pipe, rain trough.
4. *Small collection of hay in the field at harvest:* hay cock, pile of hay, hay pile, bale, bale of hay, shock, hay shock, bundle of hay, bundle, hay mound, small stack, small hay stack, bunch, rick.
5. *Shelter and enclosure for hogs and pigs:* pig sty, sty, pig pen, pen, hog shed, shed, hog barn, pig barn, barn, barn pen, hog pen, hog stable.
6. *Fence or wall made of loose rock or stone:* stone fence, stone wall, cobble fence, cobblestone fence, brick wall, barrier, drywall fence, rock abutment, rubble, rock fence.
7. *Wooden container for carrying liquid:* bucket, pail.
8. *Metal or plastic container for carrying liquid:* pail, bucket.
9. *Table scraps as refuse:* garbage, slop, swill.
10. *Utensil for frying eggs:* frying pan, skillet, spider.
11. *Water outlet at the kitchen sink:* faucet, tap.
12. *Similar device on a barrel:* spigot, tap, faucet, spout, bung, bunghole, spicket, pipe.
13. *Outdoor water outlet at the side of a house:* faucet, sprinkling faucet, hose cock, sill cock, square cock, water cock, cock, hydrant, spicket, water line.
14. *Bag or sack made of rough, loosely woven cloth:* burlap, burlap bag, burlap sack, gunny sack, crocker sack, jute bag.
15. *Small, reed wind-instrument:* mouth organ, harmonica, harp, mouth harp.
16. *Parallel harness poles on a buggy:* fills, thills, shafts.
17. *Crossbar on a wagon for an individual draft animal:* whippletree, whiffletree.
18. *Vehicle without wheels for transporting rocks and stones from a field:* dray, sled, stoneboat, cart, wheelbarrow.
19. *Cultivating implement used after plowing:* harrow, farrow, disc, drag, cultivator, tiller, tractor.
20. *Small container for coal near a stove:* coal scuttle, scuttle, coal bucket, bucket, coal hod, basket, pail.
21. *Balanced plank on which two children ride up and down:* teeter totter, teeter, teeters, see saw, see horse.
22. *Liquid burned in lamps:* kerosene, oil, coal oil, lamp oil.
23. *Thick, cotton-padded cover for a bed:* quilt, comforter, comfort.
24. *Makeshift bed on a floor:* cot, pallet, bunk, bed roll, pad, floor bed, mattress.
25. *Small freshwater stream:* creek, brook, stream, rill, inlet, riverlet.
26. *Game with metal rings which are tossed at a stake or peg:* horseshoes, quoits.
27. *Call to a cow at feeding time:* boss, bossie, hey, cow, woo-ah.
28. *Gentle, contented noise made by a horse, especially at feeding time:* neigh, whinny, bray, sigh, snort.
29. *Forked chicken bone which children like to pull:* wishbone, pulley bone.
30. *Wheatbread made of bleached flour and baked in loaves:* white bread, bread, wheat bread, bakery bread, light bread, loaf of bread, Weissbrot.
31. *Bread made of corn meal:* corn bread, johnnycake, cornmeal bread.
32. *Round fried cake with hole in the center, made of soda-leavened dough:* doughnut, fried cake, sinker.
33. *Loaf of jellied pressed-meat made of flesh from the head of a hog:* headcheese, souse, hogsouse, hog head cheese, hog's head cheese, Sulze, sylte, sylteflesk, sulc.
34. *Thick, sour milk:* lobbered milk, loppered milk, sour milk, sour cream, curdled milk, clabbered milk, clabber.

35. *Cheese made with the curds from sour milk:* cottage cheese, Schmierkase, curds, Bibbelkase, cook-cheese, smetlak.
36. *Hard center of a cherry:* pit, seed, stone, heart.
37. *Hard center of a peach:* stone, pit, seed.
38. *Beans that are snapped and cooked in the pods:* string beans, green beans, pole beans, beans.
39. *Outer covering of an ear of corn:* husks, shucks, sheafs, shells.
40. *Small, land-bound squirrel-like animal:* gopher, chipmunk, ground squirrel.
41. *Worm used for bait:* worms, angleworms, earthworms, rainworms, redworms.
42. *Insect with four long and narrow, transparent wings, often found near ponds:* dragonfly, darning needle, stinger, snake doctor.
43. *Small insect that gives off light:* firefly, lightning bug, fire bug, light bug, glow worm, June bug.
44. *A number of maple trees standing together:* maple grove, grove, cluster, orchard, arbor, clump, sugar bush.
45. *Vehicle with four wheels and a cowl for a small baby—a crib, not a chair, on wheels:* baby buggy, buggy, carriage, baby carriage, perambulator, stroller.
46. *Noisy, burlesque serenade after a wedding:* shivaree, reception, charivari, shindig, hullabaloo.

Fieldworker's Name:
Please answer the following questions without identifying yourself:
Sex ____ Race ____ Age ____ Highest grade reached in school _____
Languages other than English _____
Ethnic background _____
Neighborhood name _____
How long have you lived here? _____
Birthplace _____
Other towns, states, or countries you have lived in (please give approximate dates):
_____

_____
Have you traveled much outside Chicago? Yes or No
If so, where? _____
Parents' birthplace

	Grandfather _____
Father _____	Grandmother _____
	Grandfather _____
Mother _____	Grandmother _____

Occupation _____

But perhaps the most striking example in the realm of everyday, non-commercial folk speech is the replacement of the northern dialectal term *mouth organ* by the commercial term *harmonica* in the speech of most native Chicagoans. The fact that *harmonica* is an international word (*cf.*, German *Mundharmonika*) may have influenced this development. But an even more powerful influence has undoubtedly been the distribution of the famous and widely used Höhner harmonica, particularly through the medium of the Sears catalog. Indeed, the Sears catalog has had such a powerful impact on the American vocabulary for everyday objects that it deserves a separate study by itself.

People often think that urbanism obliterates or diminishes dialectal variation in language, but our investigation at the Field Museum demonstrates that this is an oversimplification. Many farm terms associated with dialect boundaries survive in urban speech, even when the people using them have long since lost precise referents or are unclear about exact meanings. Furthermore, technological change and the accompanying commercialism of formerly folk terms seem far more important than urbanization itself. Rather than obliterating the folk vocabulary, urbanization seems to fragment it. Then, the technological change and commercialization associated with urban culture add additional layers of vocabulary. In addition, however, urban cultures create their own, sometimes highly localized, folk vocabulary.

Chicagoanisms

There are many Chicago localisms—Chicagoanisms—but most Chicagoans don't notice them because they

seem "normal." Perhaps the most commonly cited Chicagoanisms are *prairie* "vacant lot," *ganguay* "passageway between buildings," *clout* "political influence or power," and *snorkel* "firefighting equipment." Others that might be added to the list are *parkway* "grass strip between street and sidewalk," *gaper's block* or *gaper's delay* "traffic obstruction," and *American fries* "sliced, fried potatoes." Many of these words, like *clout* and *American fries*, have spread beyond their origins in Chicago, but others remain local and still others ought to be considered as characteristic of Chicago use, even though they may have originated elsewhere and are commonly used in other restricted areas.

For example, German-speaking people have influenced the vocabulary and pronunciation of American English in several places where they have settled in large numbers, including Pennsylvania, Texas, the "Dutch Fork" of South Carolina, Wisconsin, and several large cities, such as Louisville, Milwaukee, Cincinnati, and Chicago. Some characteristic Germanisms that occur in Chicago (and in other German settlement areas) include *ach ja* "oh yes" (also a children's game), *ainna* as a question tag, probably a loan translation, or calque, of German *nicht wahr* "isn't it so?," *all* "consumed, used up, gone, dead," *already* "yet" (*cf.* German *schon*), *apple-kuchen* "apple cake," *apple-snitzen* "apple slices," and *ausgespielt* "tired out." These examples all come from the letter A in the recently published *Dictionary of American Regional English*. They supplement common German words in American English (like *flak*), and they are all cited from Chicago sources. DARE also indicates that another German-based language, Yiddish, has influenced Chicago speech, citing for example *Abie Kabibble* "person of Jewish ancestry," and *alter kocker* "old fogy," with an acronym built on *alter kocker, AK*.

It seems obvious, however, that Yiddish has not influenced Chicago's speech as much as New York's, and German has perhaps had less influence here than in Milwaukee or Cincinnati. The dominant contact language today in Chicago is of course Spanish, but even the influence of Spanish on Chicago English is open to question. For example, though knowing Spanish is a political requisite in at least four of Chicago's fifty wards, Chicagoans in general have not adopted anything equivalent to the common southern California word *pachuco* "a young tough." For another example, signs for *cerveza fria* "cold beer" appear commonly in mixed Polish-Puerto Rican neighborhoods, but one wonders how many Chicagoans of Polish descent would know how to order a cold beer in Spanish. Can we really consider *cerveza fria* a Chicagoanism within American English?

Multilingualism

As questions such as these imply, the word lists that we can derive from sources like DARE do not give us a completely accurate picture of the impact of multilingualism in Chicago. We need detailed studies of contact and of use frequency. And here, as with so many other aspects of the study of Chicago speech, Lee Pederson has provided us with a clear outline and a useful model.

Pederson distinguished at least three levels of acculturation in the migration of words from other languages to Chicago English. For example, he classified *Weissbrot* "white bread" as a poorly acculturated term because even though he had recorded it in the speech of native Chicagoans, it occurred only in the use of German bilinguals and apparently had not spread to monolinguals or to people from other, non-German linguistic backgrounds. On the other hand, Pederson classified words like Czech *kolacky* "breakfast pastry" as well assimilated because they occurred in the speech not only of Czech bilinguals but also of monolinguals and others. However, there are degrees of acculturation, and it would be useful to know more about exactly how widespread these terms are and what have been their exact avenues of transmission. In any case, Pederson's third class includes words like *shivaree* "wedding celebration," classified as fully acculturated because even though the word seems to be dying out of use, few are aware of its French origins and its users consider it a strange but thoroughly English word.

From a linguistic point of view, the motto for political success in Chicago seems to be, "If you can't switch (from one language or dialect to another), you can't fight!"

Black Speech

Among the newer native English influences, black speech in Chicago is not uniform and also differs from the types of black speech heard in the South. Neverthe-

less, the Southern influence in Chicago's black community remains strong and often sets this group off from the Yankee-based speech of neighboring whites. The table shown here indicates a few vocabulary differences we found:

Black/White Lexical Heteroglosses in Chicago

Typical White Usage	Typical Black Usage
frying pan	skillet
faucet	spigot
teeter-totter	see-saw
cherry pit	cherry seed
firefly	lightning bug

To the naive observer, the differences between black and white speech seem numerous, fundamental, and sometimes overwhelming. But as this table may begin to suggest, most differences between black and white speech are superficial, even trivial, and they seldom interfere with communication. Furthermore, we found that the differences between black and white speech are statistical; that is, while more blacks than whites are likely to use *see-saw* rather than *teeter-totter* or to pronounce words like *father* without the final *-r*, there are nevertheless many whites who use the "black" forms and many blacks who use the "white" forms. We found no categorical differences between black and white speech.

Code-Switching

Each of the subjects we touched on during the course—geography and settlement, urbanization, technological change, marketing, localisms, contact languages, and contact dialects—demands much more study than we were able to give during the brief six weeks we had available. But course participants had little doubt of the value of what they had learned. And to underscore that importance as we watched, the 26th Ward decided its runoff election largely on linguistic grounds when Manuel Torres appeared unable to debate Luis Gutierrez in Spanish on a citywide TV hookup. But the key to Gutierrez's success was not merely his ability to speak Spanish; far more importantly, Gutierrez could switch with ease and express himself with facility in *both* languages. Similarly, observers of Chicago Mayor Harold Washington were struck by his ability to switch, not languages, but dialects, depending on the audience he addresses. Linguists call this process *code-switching.*

The ability to switch from one language or dialect to another has always been a feature of Chicago politics, as suggested by comic dialect books like the Mr. Dooley series or *Gemixte Pickles.* More seriously, one student pointed out that the broadside published in 1886 which spurred the famous Haymarket riot was printed in both English and German. To be effective, the political leaders of 1886 had to appeal to their followers in both languages at once. Today, Gutierrez's facility in English and Spanish and Mayor Washington's abilities at several dialect levels provide exact contemporary parallels. From a linguistic point of view, the motto for political success in Chicago seems to be, "If you can't switch, you can't fight!"

While Chicago has developed a distinctive political and social geography, the structure of its culture is not readily apparent, and the pieces of the puzzle are easily lost track of in the mass sensory bombardment that characterizes contemporary urban life. However, we found that urban dialectology, a kind of urban anthropology, can provide useful clues for grasping some sense of the meaning of the city. Most participants in the course were not expert in phonology, but we learned the truth of Lee Pederson's observation that the local vocabulary represents "the most philologically productive component of the linguistic system, the most accessible approach to the study of representative monuments of both the oral and literary traditions in their cultural setting." As we continued to study Chicago's speech, we hope to identify even more of the strands that make up the "unparalleled babel" that Professor Buck discovered and celebrated back in 1904. FM

Further Reading

By far the most enjoyable, comprehensive, and scholarly book about American English in general is H.L. Mencken's *The American Language* in the one-volume abridged edition by Raven I. McDavid, Jr. (1963). The best book about Chicago speech, but somewhat daunting to non-phonologists, is Lee Pederson's *The Pronunciation of English in Metropolitan Chicago,* published in 1965 by the American Dialect Society. McDavid also published a shorter and very readable comparison of Chicago speech with the speech of Greenville, South Carolina (his home town) in "Dialect Differences and Social Differences in an Urban Society," printed in *Sociolinguistics,* edited by William Bright (1966). The American Dialect Society published Roger Shuy's *The Northern-Midland Dialect Boundary in Illinois* in 1962.

The basis for studying regional variation in American English words is Hans Kurath's *A Word Geography of the Eastern United States* (1949), but for Chicago we relied primarily on Pederson's "An Approach to Urban Word Geography" and "Chicago Words: The Regional Vocabulary," both published in volume 46 (1971) of the journal *American Speech.* For studying language and dialect contact, the best guide is Einar Haugen's *Bilingualism in the Americas: A Bibliography and Research Guide* (1956). Buck's "A Sketch of the Linguistic Conditions of Chicago" appeared in *The Decennial Publications of the University of Chicago,* first series (1904).

A SYLVAN RETREAT

The Wooded Island of Jackson Park, Chicago's Premier Birding Area

Dava Walsten

by Jerry Sullivan

The black rail hung out in the bushes at the south end of Wooded Island. He stayed for a whole week while birders from all over the Midwest rushed to see him. Sometimes he was hidden in the shrubbery, but often he was as visible as a robin on your lawn.

Understand that the black rail is probably the most elusive bird in North America, a will-o'-the-wisp rarely glimpsed by even the most dedicated birders. The whole tribe of rails tends toward the shy and reclusive. They are birds of marsh and wet meadow who lurk in the cattails and sedges. They fly only under extreme duress, preferring to escape observation by slipping off through the weeds. The ornithologists call them laterally compressed; common folk call them skinny as rails, and their svelte forms allow them to steal away without rustling a stem.

Jerry Sullivan edited *Chicago Area Birds,* published recently by Chicago Review Press; writes a column, "Field and Street," for the *Chicago Reader;* and has written extensively on birds of the Chicago area.

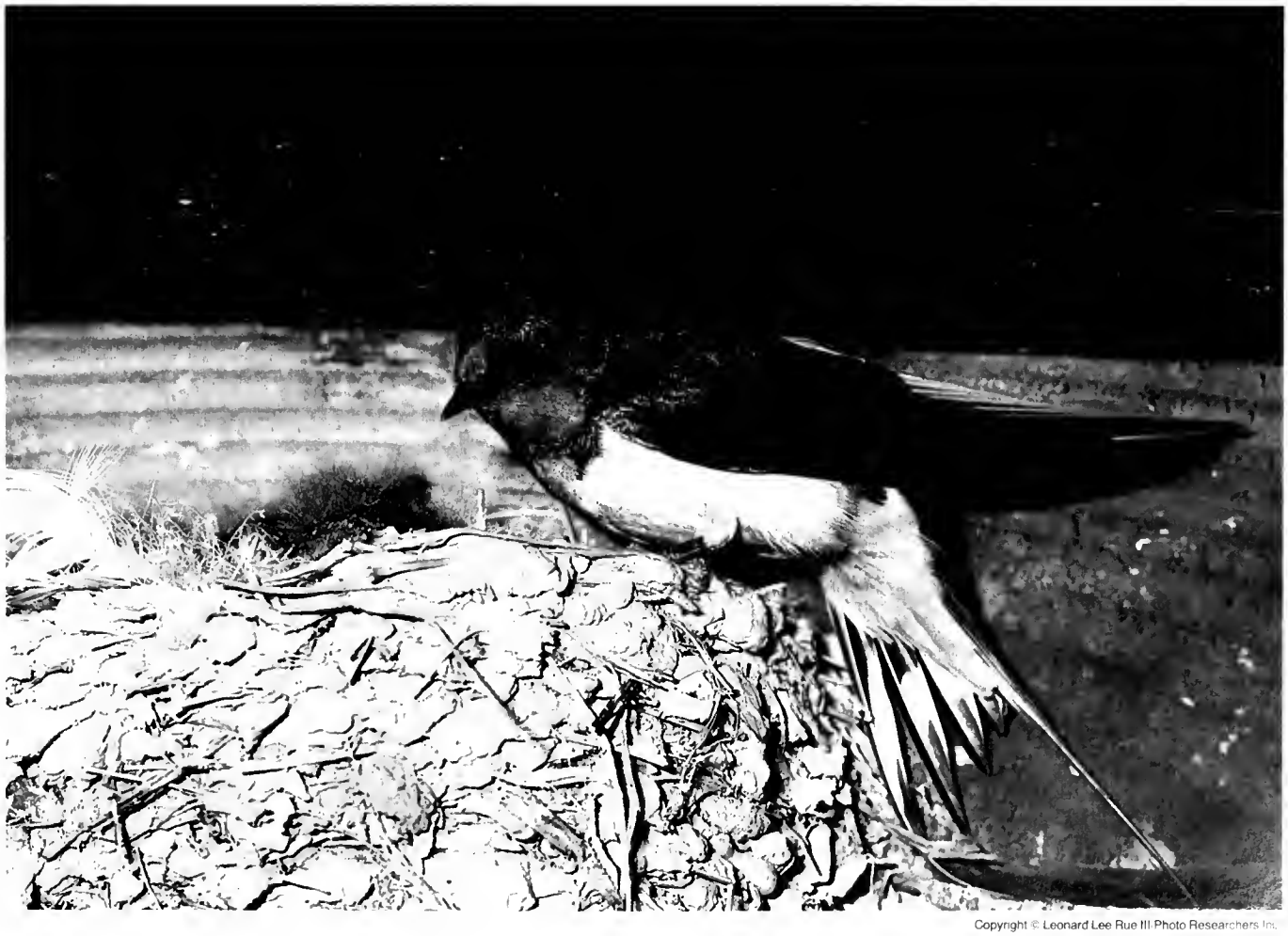
And of all this mysterious family, the black rail, a bird the size of a sparrow, is the most difficult to see. Birders have been known to drag chains across marshes to force them into flight. As a sporting act, this ranks on about the same level as dynamiting fish, but it gives you an idea of how desperate birders can get for a look at a black rail.

So the black rail who spent a week under the shrubs on Wooded Island in Jackson Park was a major event. He was there in 1972. I didn't bird the island until two years later, but when we passed the place where the bird had appeared, my guide pointed it out to me. "That's where the black rail was," she said. "It stayed a whole week." Since then, several other birders have told me the same thing.

That black rail, most anonymous of birds, has, by

Norman Owen Tomalin Bruce Coleman Inc. New York

Left: *A glimpse across Jackson Park Lagoon to Wooded Island, a neighborhood "fixture" since the 1893 World's Fair, when it was created by landscape architect Frederick Law Olmsted.* Right: *The black rail* (Laterallus jamaicensis), *probably North America's most elusive bird, was sighted on Wooded Island in 1972 and again in 1986.* Below: *A profusion of barn swallow* (Hirundo rustica) *nests occupy the girders supporting bridges to the island.*



The Japanese garden, despite vandalism, manages to survive and embellish the north end of Wooded Island. In the background is the Museum of Science and Industry, and directly in line with the museum's south portico is the Clarence Darrow Bridge, named for the famed lawyer who frequently strolled the island's peaceful grounds.

Dava Walsten

lingering for a week on Wooded Island, made himself not just famous, but immortal. Now when I take new people to the island, I point out the place to them, even though I never saw the bird. This is oral tradition in the making, and I feel an obligation not to break the chain.

Wooded Island is the one place in Chicago where a black rail in search of enduring fame could have landed and got what he was after. As a North Sider, I do most of my birding at Montrose Harbor or the Lincoln Park Bird Sanctuary. We get some birders at these places in April and May or September and October, but we are always just a small group surrounded by fishermen, joggers, dog walkers, frisbee players, drug dealers, picnickers, and unfortunate souls whose worldly goods will fit in a shopping cart.

At Wooded Island on weekend mornings in spring and fall, the birders are plainly in charge. You can't turn around without seeing somebody staring through binoculars patiently waiting for a warbler to come out from behind a leaf or for a woodpecker to come out from behind a tree trunk.

The biggest group will usually be following Doug Anderson. Doug is the current president of the Chicago Audubon Society, and he has been leading bird walks on Wooded Island for 12 years. Every Monday, Wednesday, and Friday at 7 a.m. and every Saturday at 8 a.m., from the first of March through the end of May and from the first of September until the end of November, Doug leads a party on a birding tour of the island, starting from the Clarence Darrow Bridge at the north end.

The birders circle the island on the paved walk and cross the bridge at the south end to look at the "meadow," an open grassy area. A few years ago a large portion of the meadow was converted to a golf driving range, a move

Barth Schorre/Bruce Coleman Inc. New York

The yellow warbler (Dendroica petechia), *a common Illinois resident, adds its canary brightness to the island's verdant scene.* ◊

not calculated to please the nesting bobolinks and savannah sparrows.

Some mornings, Doug will collect 50 birders for the outing. His will be the largest group, but by no means the only one. Small groups of friends and lone individuals are also about.

They are attracted by some of the best birding in the Chicago area. Doug's groups have, during the 12 years, compiled an aggregate list of 266 species. Included in that total are the first Illinois record for Townsend's warbler, a western bird that you would not expect to see east of Wyoming; a lesser black-backed gull, a bird that does not breed in the Western Hemisphere.

And there is a long list of somewhat less remarkable but nonetheless very interesting species, like the goshawk that spent a good part of the 1984-85 winter on the island, the peregrine falcon that could be found perched at the top of a tall, dead cottonwood for two weeks, or the bald eagle that occupied another tree.

We owe some of these records to the sheer numbers of birders who visit the island. All those eyes make a difference. A rare bird has only a slim chance of slipping through unnoticed at Wooded Island.

We owe the others to the fact that Wooded Island, while it is not actually a woods, is more thickly planted with trees and shrubs than any other Chicago Park District property. It still remains much of the "secluded, natural, sylvan aspect" that the great landscape architect Frederick Law Olmsted wanted.

Jackson Park was created for the 1893 World's Columbian Exposition, the great fair organized to celebrate the 500th anniversary of Columbus's discovery of America. The architectural firm of Burnham and Root conceived the overall design for the fairgrounds, and Olmsted, the man who designed New York's Central Park and the Capitol grounds in Washington, had the responsibility for landscaping. Given the state of Jackson Park, his was a very large job.

Olmsted thought so little of the Jackson Park site that he tried to convince the fair's organizers to select a

Observant visitors may glimpse the handsome wood duck (Aix sponsa) *feeding in the quiet lagoon waters.*

Kenneth W. Fink/Bruce Coleman Inc. New York

Dave Walsten

In winter, the island's snow-covered meadows are popular with cross-country skiers as well as with bird-watchers. The northern cardinal (Cardinalis cardinalis), *a year-round resident, adds scarlet touches to the white landscape.*

place farther south. That did not work out because the railroads, particularly the Illinois Central, which would carry most of the visitors to and from the fair, balked at extending their tracks. Olmsted had to make a choice between Jackson Park or Washington Park, about a mile to the west. He chose Jackson because the lake provided, in his view, a more scenic setting than could be had inland. It should be said that Olmsted was an Easterner who did not think much of our generally treeless landscape.

Jackson Park was totally wild land. Three sand ridges, beaches left over from earlier and higher stages of Lake Michigan, ran from north to south through the site, and between them were marshes. The only trees grew on the two ridges farthest from the lake. They were oaks, none more than 40 feet tall, and they all showed the effects of growing in poor, sandy soil in a situation where their roots were likely to be under water much of the time. Olmsted thought them scraggly and unthrifty looking, but he figured they were worth saving given the brief span of time he had to prepare for the fair. They are still green and thriving today.

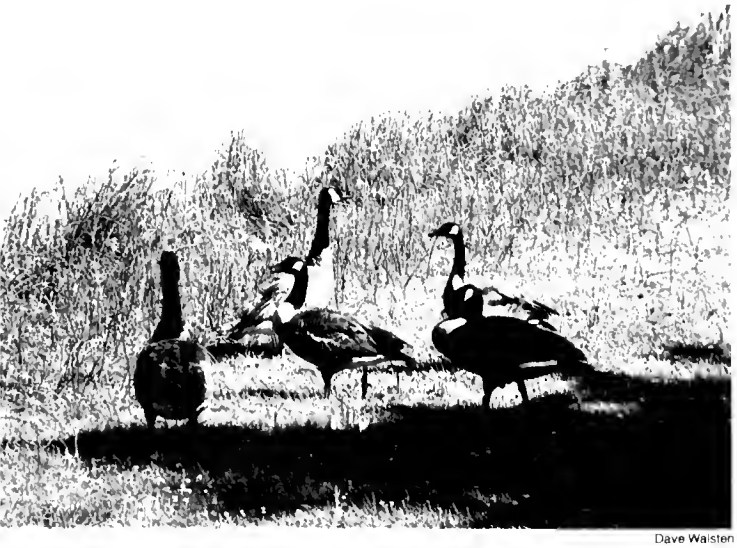
In these overdeveloped times, we would get very excited about a piece of natural shoreline along Lake Michigan, but Olmsted thought the place looked "forbidding," and he remarked, in an article written for *Inland Architect* magazine, on the tendency of "town governments, when they find bodies of land . . . not favorable to the ends of dealers in building lots, to regard them as natural reservations for pleasure grounds." Nothing else about this desolate place, he thought, would recommend it for a park.

Working with Burnham and Root, Olmsted conceived a design for Jackson Park that built on the natural shape of the landscape. He would dredge the marshes and heap the spoil on the old beach ridges, creating a system of lagoons separated by islands and peninsulas where the fair's buildings would stand.

Burnham and Root created the buildings, working in the then popular Beaux Arts style. They have been criticized, then and now, for making such a conservative choice, especially here in Chicago where Louis Sullivan and others were, at the time, busy creating an entirely new and distinctively American architectural style. Some critics claim that Burnham and Root's designs set American architecture back 50 years.

The Canada goose (Branta canadensis) *has been a visitor to Wooded Island for many years, but only recently has it been known to breed there. This summer, two pairs of the fairly tame birds raised a total of five young.*

The green heron (Butorides virescens), *though still a common sighting, is not as abundant on the island as in previous years. Its cousin, the stately great blue heron* (Ardea herodias), *North America's largest heron, may often be seen during the warmer months perched on dead limbs along the water's edge.*



Dave Walsten

Nearly all the fair buildings were temporary structures that were torn down when the fair closed. The one major building that remains is the Palace of Fine Arts, which housed the Field Museum for its first 28 years and now houses the Museum of Science and Industry. Wooded Island is immediately south of the museum, separated from it by one of the lagoons.

The fair buildings faced on both land and water, and Olmsted specified that people should be able to enter on foot or by boat. He chose the styles of boats to be used, thinking of them in aesthetic terms as elements in his landscape composition, just like the flocks of domestic ducks and geese that were released in the waters.

Olmsted faced a serious problem in deciding what plants to use to decorate the shores of his lagoons. Since the lagoons connected with the lake, they would be subject to the same variations in water levels as Lake Michigan. He solved his problem by sending gangs of men out to scour the marshes and ponds of Illinois and Wisconsin to collect cattails, flags, rushes, irises, and pond lilies. The men gathered several million plants, enough to fill 75 boxcars, and Olmsted's crews replanted them at the new site.

The Wooded Island was to be a refuge from the noise and crowds of the fair, a quiet place where visitors could feel close to nature and whence they could look out over the shimmering waters of the lagoons at the fair's pavilions.

Olmsted knew that there would be tremendous pressures put on him to allow exhibits on Wooded Island. He fought all of them, but was finally forced to yield. A small Japanese exhibit, including a teahouse, was placed at the north end of the island, and some horticultural exhibits were placed amidst the sylvan retreat he had planned.

Some parts of the Japanese exhibit remained after the closing of the fair, and in 1935, the teahouse reopened. Young girls in kimonos served visitors.

According to Doug Anderson, who is a sort of unofficial historian of Wooded Island, the teahouse was a big attraction, and the late thirties probably saw more visitors to Wooded Island than any time since the fair. Unfortunately, December 7, 1941, put a temporary end to the exotic charm of things Japanese, and during World War II, vandals burned down the teahouse.

Other people were using the island too. Clarence Darrow used to come there often. He had little interest in nature, although he had learned something about birds while defending Leopold and Loeb. The two brilliant, twisted young men were active birders who had managed to publish in ornithological journals while they were still teenagers.

Darrow apparently came to Wooded Island for the peace that surrounds the place, and when he died in 1938, his ashes—at his request—were scattered in the lagoon from the bridge that connects the north end of the island to the mainland. Every year on the anniversary of his death, people gather for a memorial service on the Clarence Darrow Bridge.

Senator Paul Douglas loved the island too. He came there frequently in his years as a University of Chicago economics professor and alderman from the Fifth Ward. After his election to the Senate he was in Washington most of the time, but upon his retirement in 1966, he again became a regular visitor. His ashes were scattered in the formal Japanese garden recently restored by the Park District on the site of the long ago teahouse.

After the Senator's death in 1978, Doug Anderson asked the Park District board to designate Wooded Island as the Paul Douglas Nature Sanctuary, and the board complied.

The lesser black-backed gull (Larus fuscus), *which breeds in Europe, has been sighted just across the lagoon from Wooded Island.*

Doug often discusses the island with the Park District, mainly in an effort to restrain their zeal with the chain saw. He remembers playing on the island as a child and thinking of the place as a jungle, so to his eye, even the rather lush vegetation of today looks rather sparse.

About 10 years ago, shortly after Doug Anderson began leading bird walks on the island, Harriet Rylaarsdam began to join his morning gathering. She had had some experience with birding in college, but the pressures of child rearing had kept her away from it for a number of years. Wooded Island brought her back into it, especially after she met Paul Clyne. Clyne was then a graduate student in linguistics at the University of Chicago, and he birded Wooded Island every morning. Under his influence, she began to do the same. He helped sharpen her skills and showed her how to keep careful records of what she saw.

Together, they found that Townsend's warbler, and Clyne left her with the nerve-wracking job of keeping an eye on the bird while he ran to a phone to spread the word about the sighting.

Right now, she is helping Clyne complete a manuscript that would provide a complete bird list for Jackson Park, combining both recent sightings and historical records, some going back to 1918. The list includes 266 species, a number of them rarities like the Brewer's sparrow that visited the nearby Lake Michigan shore in May, 1982, providing the first sighting east of the Mississippi for this southwestern species since 1872.

The manuscript will also list the more than 40 species that have been discovered breeding on or around Wooded Island in the past decade. The breeding list is amazing for a city park, including wood duck, hooded merganser, green heron, warbling vireo, yellow warbler, Canada goose, and tree swallow. The nesting species make Wooded Island the only lakefront location in the city where the birding is interesting year around.

Drawing on Clyne's manuscript, Harriet can provide real historical perspective. Consider the Bohemian waxwing seen in 1919 and not again until 1985, or the Bachman's sparrow seen in 1918 and not at all since.

A yellow rail, a slightly less elusive cousin of the black rail, was recorded in October, 1980, and this past spring, lo! a black rail was sighted by Bob Lewis, a University of Chicago graduate student, along the lagoon just north of the island. The bird allowed Lewis to get so close he could study it without binoculars, but this individual was less bold than his conspecific of 1972. Despite diligent search, no one else ever saw it. We may have to wait 14 years for another chance.

Dave Walsten

Perhaps an eyesore to some, the dead cottonwood shown here has recently provided a convenient perch for a peregrine falcon (Falco peregrinus).

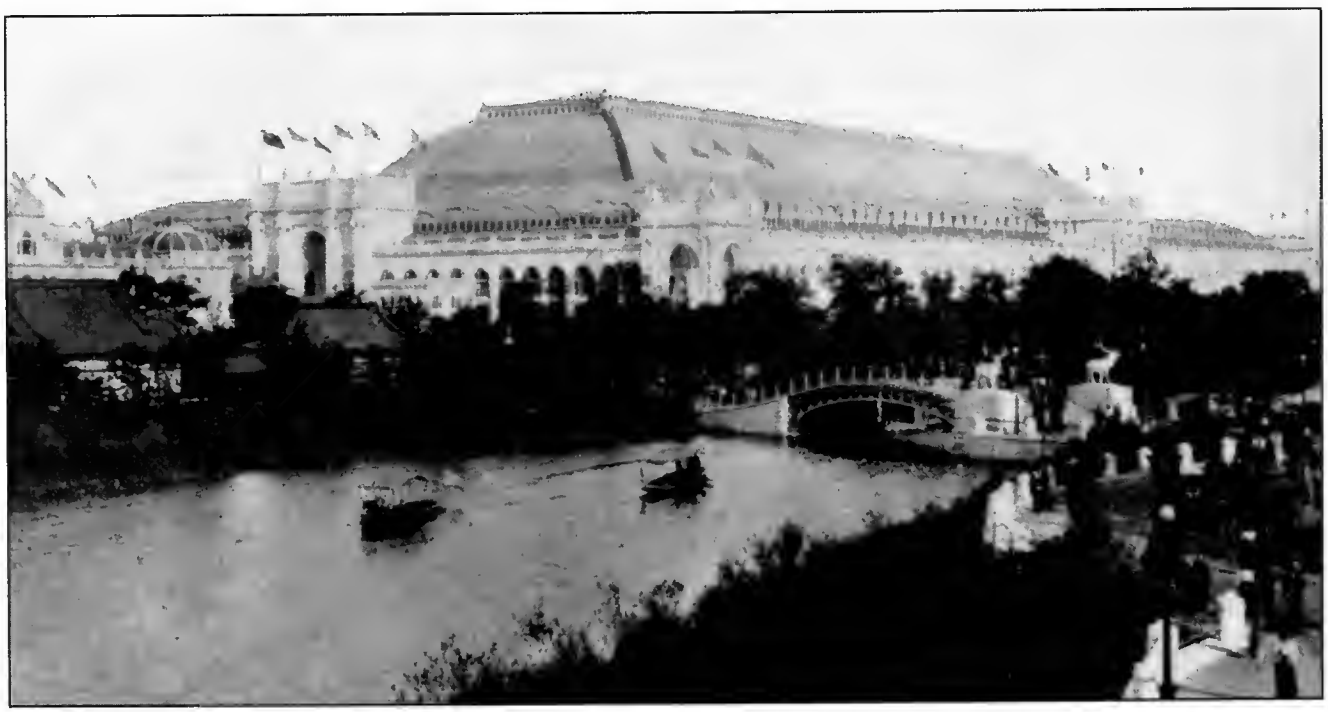
The northern goshawk (Accipiter gentilis), *an occasional visitor, was last seen on the island during the winter of 1984-85, when it spent several weeks dining on rabbit.* ◊

Birds Sighted in Chicago's Jackson Park in Recent Years

(Wooded Island is located in Jackson Park)

Red-throated Loon*
Common Loon
Pied-billed Grebe
Horned Grebe
Eared Grebe
Double-crested Cormorant
American Bittern
Least Bittern
Great Blue Heron
Great Egret
Tricolored Heron
Cattle Egret
Green-backed Heron
Black-crowned Night Heron
Yellow-crowned Night Heron
Tundra Swan*
Mute Swan
Snow Goose
Canada Goose
Wood Duck
Green-winged Teal
American Black Duck
Mallard
Northern Pintail
Blue-winged Teal
Northern Shoveler
Gadwall
American Wigeon
Canvasback
Redhead
Ring-necked Duck
Greater Scaup
Lesser Scaup
Harlequin Duck
Oldsquaw
Black Scoter*
Surf Scoter*
White-winged Scoter*
Common Goldeneye
Bufflehead
Hooded Merganser
Common Merganser
Red-breasted Merganser
Ruddy Duck
Turkey Vulture
Osprey
Bald Eagle
Northern Harrier
Sharp-shinned Hawk
Cooper's Hawk
Northern Goshawk
Red-shouldered Hawk
Broad-winged Hawk
Red-tailed Hawk
Rough-legged Hawk
American Kestrel
Merlin
Peregrine Falcon
Ring-necked Pheasant
Black Rail
Virginia Rail
Sora
Common Moorhen
American Coot
Sandhill Crane
Black-bellied Plover
Lesser Golden Plover
Semipalmated Plover*
Piping Plover*
Killdeer
American Avocet*
Greater Yellowlegs
Lesser Yellowlegs
Solitary Sandpiper
Willet*
Spotted Sandpiper
Upland Sandpiper
Whimbrel*
Marbled Godwit*
Ruddy Turnstone*
Red Knot*
Sanderling*
Semipalmated Sandpiper*
Western Sandpiper*
Least Sandpiper
White-rumped Sandpiper*
Baird's Sandpiper*
Pectoral Sandpiper
Dunlin
Stilt Sandpiper*
Buff-breasted Sandpiper*
Short-billed Dowitcher*
Common Snipe
American Woodcock
Laughing Gull*
Franklin's Gull
Common Black-headed Gull*
Bonaparte's Gull*
California Gull*
Herring Gull
Thayer's Gull*
Iceland Gull*
Lesser Black-backed Gull
Glaucous Gull*
Black-legged Kittiwake
Caspian Tern
Common Tern
Forster's Tern
Black Tern
Rock Dove
Mourning Dove
Monk Parakeet
Black-billed Cuckoo
Yellow-billed Cuckoo
Eastern Screech Owl
Great Horned Owl
Snowy Owl*
Long-eared Owl
Short-eared Owl
Northern Saw-whet Owl

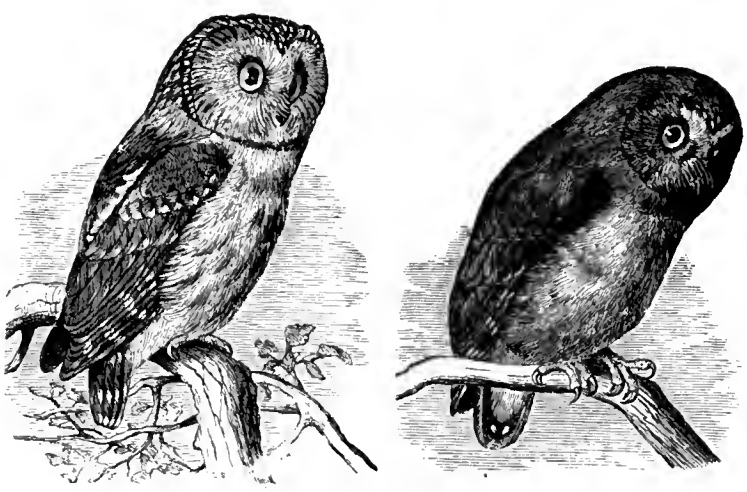
View of Wooded Island and lagoon during the 1893 World's Columbian Exposition. The Japanese buildings (the island's only structures), at the north end, have been replaced by a garden.



Broad-winged Hawk

Common Nighthawk
Whip-poor-will
Chimney Swift
Ruby-throated Hummingbird
Belted Kingfisher
Red-headed Woodpecker
Red-bellied Woodpecker
Yellow-bellied Sapsucker
Downy Woodpecker
Northern Flicker
Olive-sided Flycatcher
Eastern Wood-Pewee
Yellow-bellied Flycatcher
Acadian Flycatcher
Alder Flycatcher
Willow Flycatcher
Least Flycatcher
Eastern Phoebe
Great Crested Flycatcher
Western Kingbird
Eastern Kingbird
Horned Lark
Purple Martin
Tree Swallow
Northern Rough-winged Swallow
Bank Swallow
Cliff Swallow
Barn Swallow
Blue Jay
American Crow
Black-capped Chickadee
Red-breasted Nuthatch
White-breasted Nuthatch
Brown Creeper
Carolina Wren
House Wren
Winter Wren
Sedge Wren
Marsh Wren
Golden-crowned Kinglet
Ruby-crowned Kinglet
Blue-gray Gnatcatcher
Eastern Kingbird
Veery
Gray-cheeked Thrush
Swainson's Thrush
Hermit Thrush
Wood Thrush
American Robin
Gray Catbird
Northern Mockingbird
Brown Thrasher
Water Pipit
Bohemian Waxwing
Cedar Waxwing
Northern Shrike
European Starling
White-eyed Vireo
Bell's Vireo
Solitary Vireo
Yellow-throated Vireo
Warbling Vireo
Philadelphia Vireo
Red-eyed Vireo
Blue-winged Warbler
Golden-winged Warbler
Tennessee Warbler
Orange-crowned Warbler
Nashville Warbler
Northern Parula
Yellow Warbler
Chestnut-sided Warbler
Magnolia Warbler
Cape May Warbler
Black-throated Blue Warbler
Yellow-rumped Warbler
Townsend's Warbler
Black-throated Green Warbler
Blackburnian Warbler
Pine Warbler
Prairie Warbler
Palm Warbler
Bay-breasted Warbler
Blackpoll Warbler
Cerulean Warbler
Black-and-white Warbler
American Redstart
Prothonotary Warbler
Worm-eating Warbler
Ovenbird
Northern Waterthrush
Louisiana Waterthrush
Kentucky Warbler
Connecticut Warbler
Mourning Warbler
Common Yellowthroat
Hooded Warbler
Wilson's Warbler •
Canada Warbler
Yellow-breasted Chat
Summer Tanager
Scarlet Tanager
Northern Cardinal
Rose-breasted Grosbeak
Indigo Bunting
Dickcissel
Rufous-sided Towhee
American Tree Sparrow
Chipping Sparrow
Clay-colored Sparrow
Brewer's Sparrow •
Field Sparrow
Vesper Sparrow
Savannah Sparrow
Grasshopper Sparrow
Henslow's Sparrow
Le Conte's Sparrow
Sharp-tailed Sparrow
Fox Sparrow
Song Sparrow
Lincoln's Sparrow
Swamp Sparrow
White-throated Sparrow
White-crowned Sparrow
Harris' Sparrow
Dark-eyed Junco
Oregon Junco
Snow Bunting
Bobolink
Red-winged Blackbird
Eastern Meadowlark
Western Meadowlark
Yellow-headed Blackbird
Rusty Blackbird
Brewer's Blackbird
Common Grackle
Brown-headed Cowbird
Orchard Oriole
Northern Oriole
Pine Grosbeak
Purple Finch
House Finch
Common Redpoll
Pine Siskin
American Goldfinch
House Sparrow

• *Sighted along Jackson Park's Lake Michigan shoreline*



Adult. Northern Saw-whet Owl Immature

The above list is based on the observations of many persons, but the editor is particularly indebted to Harriet Rylaarsdam and Doug Anderson for its preparation here.

Millipede Hording

A Curious Phenomenon of Nature

by Joseph Hannibal *and* Cassandra Talerico

"I Recall Very Clearly the afternoon when our small field party chanced upon this striking mass of millipeds,*" wrote Rainer Zangerl, curator emeritus of fossil fishes at Field Museum and former chairman of the Department of Geology. "We approached a small valley in the eastern bluffs of Indiana's Pleistocene Wabash Valley northeast of Montezuma. An old, rotten barn stood at the mouth of this valley in a pasture. When we got close to the barn we noticed a large number of millipeds in the grass; as we entered the valley, which is wooded with the typical forest of this area, the millipeds markedly increased in number.

"They were all over the floor of the valley, in many places so thick that one had to look for vacant places to step. The milliped density decreased up the slopes (where it was distinctly drier than on the valley floor). The smell of hydrogen cyanide [exuded by some millipedes as a defense mechanism] in the bottom of the valley was so potent that we did not linger there very long. All millipeds seemed to be adult and of uniform size. There was no way we could have estimated their numbers since many were probably beneath leaf litter and many of those visible were in clumps."

Zangerl's curious observation, made while leading a paleontological field trip in June, 1959, though not unique, was highly unusual. Similar instances of millipedes gathering in enormous hordes have been recorded in other parts of the world, but no fully satisfactory explanation of this truly awesome—even intimidating—sight has been put forth.

Millipedes are multi-segmented arthropods comprising the class Diplopoda. Worldwide in distribution, they include some 10,000 species and range in size from less than 4mm (about 1/6") long to about 28cm (7"). They differ from their close relatives the centipedes in having two pairs of legs on most body segments; centipedes have one pair per segment. Millipedes (unlike some centipedes) are also quite harmless and they spend most of their time out of sight in dark, damp habitats, such as leaf litter and garden compost piles. Millipede hordes—sometimes called "migrating armies"—have been reported in all the continents except Antarctica. In North America they have been seen in a number of areas, including Illinois and nearby states.

Hording by the same species seen by Zangerl (*Pleuroloma flavipes***) has been documented a number of times. Frank Young, of Indiana University, reported a June 1957 sighting in the *Proceedings* of the Indiana Academy of Sciences. His observations were similar to Zangerl's: "When the dead leaves on the forest floor were lifted, hundreds [of millipedes] were uncovered feeding and moving about at every point examined over an area about 30 feet long by 20 feet wide. In places in which the leaf mat was intact one could hear the millipedes feeding below, and the whole area had a distinct odor of crushed cherry leaves due to the HCN gas released from the repugnatorial glands of the millipeds."

Millipede hordes encountered in woodlands create no problem other than possible revulsion or fear—which is not warranted since the creatures are completely harmless, but in areas of human traffic they have sometimes been disruptive. Large aggregations on railroads halted trains in Hungary in 1878, in France in 1900, and in Germany in 1906 and 1938.

Millipede swarms overran residential areas north of Dayton, Ohio, in 1963 and 1964—events documented by J.M. Ramsey of the University of Dayton in the *Ohio Journal of Science*. He identified the millipedes as *Pseudopolydesmus serratus* (like *Pleuroloma flavipes*, a "flat-backed" species). The millipedes traveled at night and sought cover during the day, Ramsey reported, and their swarms were "a source of aggravation and alarm to a number of property owners."

In August and September of 1902 an invasion of the Ohio State University area, in Columbus, was reported

Joseph Hannibal is associate curator of invertebrate paleontology at the Cleveland Museum of Natural History. Cassandra Talerico, at the time this article was prepared, was an assistant in invertebrate paleontology at the Cleveland Museum of Natural History.

*"Milliped" is an alternate spelling of "millipede."

**formerly named Zinaria butleri and Fontaria virginiensis.

by Max Morse in *Science*: "Complaints were made by residents along adjacent avenues of the numbers of these 'worms,' as they were called, which covered the sidewalks and terraces and even entered the residences. Often in passing along the paths running in the campus it was found to be difficult, if not impossible, to avoid crushing numbers at every step."

Millipede hordes are usually short-lived, but they can be persistent, as the residents of Streamwood, a Chicago suburb, discovered in 1962. The villagers tried lime, muriatic acid, ammonia, DDT, various chemical sprays, and even gasoline, with little effect against the army.

Most instances of hording are apparently one-time events where they have been observed, but recurrences are known. Beginning in the spring of 1958 and continuing every spring for several years thereafter, large aggregations of millipedes appeared on a farm near Paintsville, Kentucky, apparently feeding on rotting vegetables and animal fodder. One year the horde was so overwhelming that the farmer resorted to a propane blowtorch to burn them from the walls of his house.

Cedar Point, Ohio, now the site of an amusement park, has also been the chosen spot for recurring aggregations. In the early years of this century, *Pleuroloma* hordes were observed there on several occasions.

Moisture is one of the factors to consider in trying to explain millipede hording. Frank Young found that *Pleuroloma flavipes* moved more slowly under humid conditions, aggregating in damper parts of the woodland floor. Rainer Zangerl observed the same species aggregating in particularly large numbers in a dry stream bed — a relatively moist habitat. Many aggregations appear to correlate with rainfall activity. A sighting in an arid region of New Mexico was recorded during that region's rainy season. Periodic mass appearances in India occur during the annual rains. In the Midwest, millipedes have been reported crawling up telephone poles just before rainfall. Swarming before a rain has also been observed in Louisiana.

Additional factors may be the availability of preferred food and habitat. A number of invasions have been reported in the east central states, where dense forests, with abundant leaf litter and other organic material, provide shelter, moisture, and food — an ideal millipede habitat.

Some specialists, including the noted English biologist J.L. Cloudsley-Thompson, believe that aggregating may be stimulated by a complex of environmental factors, such as the effects of soil humidity and texture on the hatching of millipede eggs.

While the causes of hording remain elusive, there are steps one can take to control them. Charles T. Behnke, Ohio Agricultural Cooperative Extension agent, recommends the removal of organic material, such as grass clippings, from areas near the house. Home invasions may be prevented by such basic measures as sealing basement doors and other openings. A variety of insecticides are also now recommended. But since the aggregations are usually short-lived, and millipedes pose no physical threat to man, insecticides may not always be warranted.

A useful course of action, in any case, may be to take photos of the horde, as Zangerl did, and collect a number of specimens to pass on to a specialist. It may also be productive to contact the specialist immediately, so that he may have the opportunity to observe and record this curious event. **FM**

Photo made by Rainer Zangerl in 1959 of hording millipedes in Indiana's Wabash Valley. Courtesy Rainer Zangerl.

The authors are indebted to several colleagues for aid in preparing this article: Rainer Zangerl allowed us to quote from his unpublished account of his discovery of the mass aggregation in Parke County, Indiana. Richard L. Miller, of the Ohio State Cooperative Extension Service, supplied us with information about hording events at Streamwood, Illinois, and Paintsville, Kentucky. Rowland M. Shelley, of the North Carolina State Museum of Natural History, provided many helpful comments on an earlier draft, substantially improving this article.

FIELD MUSEUM TOURS

Dear Field Museum Member,

Have you ever considered a Field Museum tour?

I'd like to tell you about our tours—from "Bon Voyage!" to "Welcome Home!" We feel our tours are exceptional because each has one of the Museum's curators as a tour leader, and this individual takes an active part in tour preparation.

There are many things to see and do before you're really on your way. Before any tour departs, we plan an Orientation Meeting for all the tour participants. This gives everyone the opportunity to meet the curator who will lead the tour, and also to hear an informative lecture, illustrated with slides. It also gives the travellers a chance to ask questions pertaining to the natural and/or social history of the tour. We go over the itinerary, and I am always there to answer questions about logistics.

In March/April of this year we featured a New Zealand tour, which coincided with the Museum's "Te Maori" exhibition. The exhibit provided an informative lecture series, as well as the opportunity to view outstanding artifacts—an exciting introduction to the New Zealand trip!

If you see an announced tour which particularly appeals to you, just send an advance deposit of $50 per person to the Field Museum's Tours office, to ensure your place. You will be notified about all upcoming activities related to the tour, and the deposit is completely refundable should you change your mind prior to the first installment payment.

Advanced planning assures a successful and memorable trip. Passports, visas, inoculations, insurance and currency rates must be taken into consideration. What's the mean temperature and average rainfall? The age-old questions of what to pack and who else is going? Is there a detailed itinerary, and can you find a reading list to find out what you'd really like to see? How can you be reached during an emergency? Window or aisle? All these arrangements are completed for you by our office.

When you travel with Field Museum, you travel with a purpose. Your Tour Leader is a constant source of information about the country's flora, fauna, and cultural heritage. Someone is always there to regulate or adjust transportation, lodging, and meals.

Tours projected for 1987 include Peru, China, the Galapagos, Hawaii, Canada's Queen Charlotte Islands, New Zealand, and—aboard the *Sea Cloud*—the western Caribbean, Tikal, and the Yucatan.

For reservations, call or write Dorothy Roder (322-8862), Tours Manager, Field Museum, Roosevelt Rd. at Lake Shore Dr., Chicago, Il 60605

Stanton Cook, courtesy The Chicago Tribune

hen the tour is completed, it's still not really over, because we n touch. We also arrange for a reunion party, to relive the ence and share photographs and stories. Besides, we find that r participants' suggestions and comments are extremely help- d ensure that we continue to plan tours which reflect what you o see and experience.

look over the list opposite, which presents some of the 1987 ow under consideration. If you'd like more information, contact me. One of the nicest things about my position at Museum is the joy of sharing your expectations for a never-to- otten trip, so I'd love to hear from you.

ely yours,

Dorothy S. Roder

y S. Roder

Field Museum of Natural History
Membership Department
Roosevelt Road at Lake Shore Drive
Chicago, IL 60605-2499

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7411 NORTH GREENVIEW
CHICAGO IL 60626

FIELD MUSEUM OF NATURAL HISTORY BULLETIN

October 1986

CENTENNIAL DIRECTIONS

Field Museum Looks to Its 2nd Century

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Events

Dinosaur Days—A Month of Fun

Saturdays and Sundays in October
11:00 am-4:00 pm.

DINOSAURS may have vanished 65 million years ago, but you can find them again at Field Museum. All junior paleontologists are welcome weekends in October for our annual Dinosaur Days celebration. Help create a giant dinosaur or design and build a smaller replica of your own. Recognize different types of dinosaurs by creating a dinosaur hat. Make tracks to a display of dinosaur footprints, listen to stories, enter the Dinosaur Olympics, and much much more.

Have fun while examining our prehistoric earth. All programs are free with Museum admission and tickets are not required. A complete schedule of activities is available at the Museum entrances on Dinosaur Days. For more information, call (312) 322-8854.

Child's Play Touring Theatre

Saturday and Sunday, October 18 and 19
2:00 pm.
Stanley Field Hall

JOIN IN Child's Play Touring Theatre's "Drama of the Dinosaurs." You might meet some of the lesser known dinosaurs, such as the Sillyosaurus—a very silly dinosaur, the Leanosaurus who cannot seem to stand up straight, and the Triceratops Dentist who takes care of them all. This unique theatre company transforms the stories and poems of Chicago area children into plays and songs for the delight of all ages. Still, they will need your help in the prehistoric production, so come and play with Child's Play Touring Theatre.

This program is free with Museum admission and tickets are not required.

Family Feature

Time Marches On

October 11 and 12
1:00-3:00 pm.

SCIENTISTS BELIEVE the earth celebrated its 4 billionth birthday before dinosaurs appeared. What was walking, swimming, crawling, or flying around before that? What did our planet look like? Draw your ideas on our giant time line and take a look at our world of long ago.

Family features are free with museum admission and tickets are not required.

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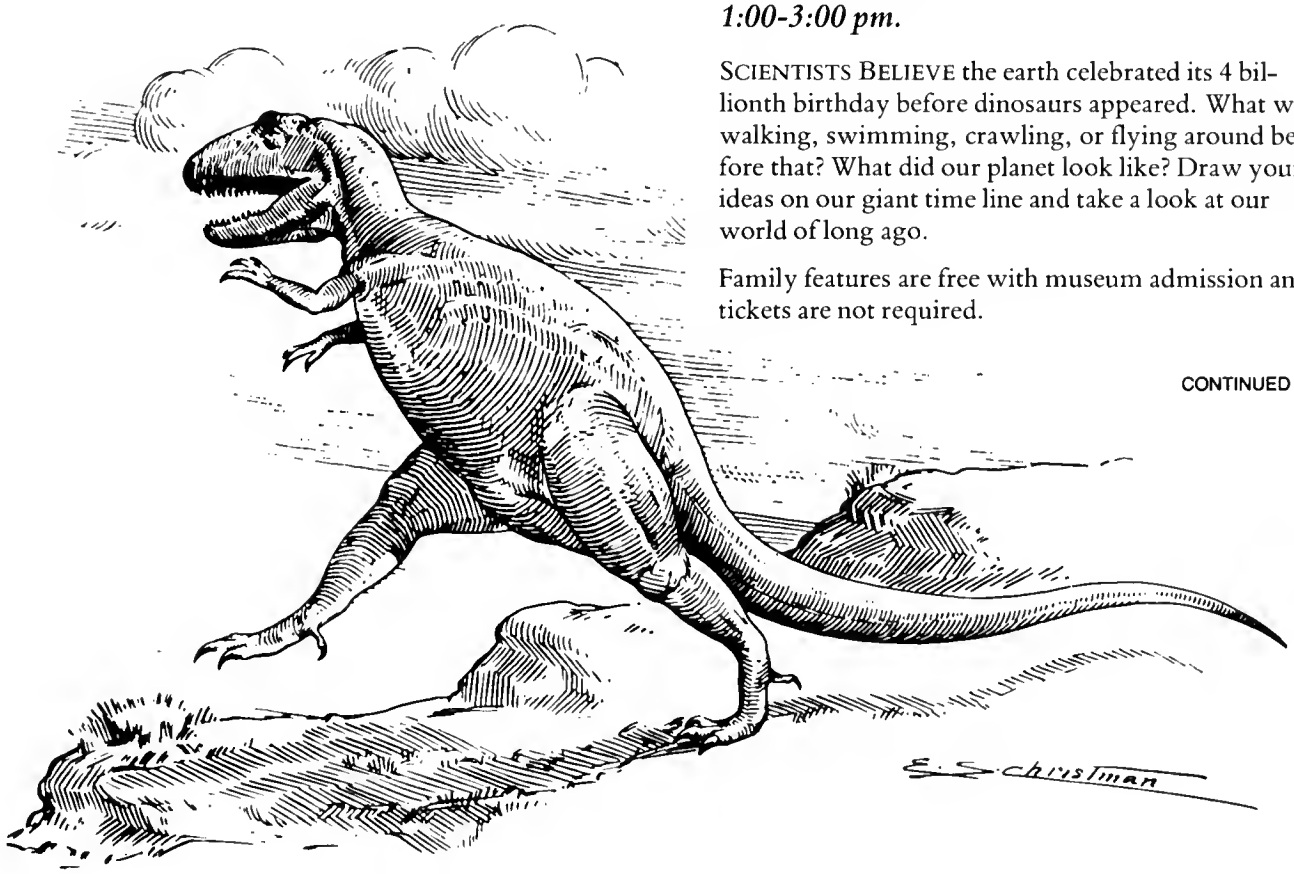


Events

Continental Drift: An Update

Saturday, October 25, 2:00 p.m.
James Simpson Theatre
Tickets $5.00 (Members: $3.00)

THE THEORY OF CONTINENTAL DRIFT explains the development of earthquakes, volcanoes, mountains, and oceans. Still, this theory was not accepted until the 1960s. Join three leading scientists in a panel discussion on our drifting continents.

Panel members include:

Dr. Ursula Marvin
Smithsonian Astrophysical Observatory
Cambridge, Massachusetts

Dr. L.W. Morley
Adjunct Professor in the Center for Research in Experimental Space Science and The Department of Earth and Atmospheric Science
York University; Ontario, Canada

Dr. Jack Oliver
Professor and Director of the Consortium for Continental Reflection Profiling
Cornell University; Ithaca, New York

Moderator:

Mr. Paul Sipiera
Associate Professor of Earth Sciences
Harper College; Palatine, Illinois

October Weekend Programs

EACH SATURDAY AND SUNDAY you are invited to explore the world of natural history at Field Museum. Free tours, demonstrations, and films related to ongoing exhibits at the Museum are designed for families and adults. Listed below are only a few of the numerous activities each weekend. Check the Weekend Programs sheet upon arrival for the complete schedule and program locations. The programs are partially supported by a grant from the Illinois Arts Council.

October

4 11:30am. *Ancient Egypt* (tour). Explore the traditions of ancient Egypt from everyday life to myths and mummies.

5 1:00pm. *Welcome to the Field* (tour). Enjoy a sampling of our most significant exhibits as you explore the scope of Field Museum.

These programs are free with Museum admission and no tickets are required.

Registration

Be sure to complete all requested information on the ticket application. If your request is received less than one week before the program, tickets will be held in your name at the West Entrance box office. Please make check payable to Field Museum. Tickets will be mailed upon receipt of check. Refunds will be made only if the program is sold out.

☐ Member ☐ Nonmember

American Express/Visa/MasterCard

Card Number

Signature Expiration Date

Return complete ticket application with a self-addressed stamped envelope to:

Field Museum of Natural History
Public Programs: Department of Education
Roosevelt Road at Lake Shore Drive
Chicago, IL 60605-2497

Have you enclosed your self-addressed stamped envelope?

Name

Address

City State Zip

Telephone: Daytime Evening

"Continental Drift: An Update"

Member Tickets # Requested	Nonmember Tickets # Requested	Total Tickets Requested	Amount

Ron Testa 83127

The Field Museum of Natural History, south aspect

Centennial Directions

Field Museum Looks to Its Second Century

CENTENNIAL DIRECTIONS

SUMMARY

Envisioned as the permanent legacy of the Columbian Exposition, Field Museum was created as a repository of encyclopedic collections reflecting the diversity of the earth's environments and cultures. The Museum was also to discover and disseminate knowledge based on these collections. Over time the Museum has become one of the four major natural history museums in the world.

Looking to its centennial in 1993, Field Museum of Natural History has engaged in a comprehensive self examination of how best to serve as a collections based center of research and public understanding in its second century.

The challenge to such a center is unprecedented. The world has become a more congested place generating intense pressures on nature and society. The scope of natural history research has broadened dramatically with the proliferation of new methods and technologies. Public interest and understanding are difficult to secure, given the array of media and leisure activities competing for attention.

In confronting this challenge, the Museum has recognized that it has two distinct missions requiring distinctly different approaches. The research institute focuses on scholarship and the nation's research needs; the public museum serves diverse public needs for education and entertainment. To pursue these two missions, the Museum has reorganized itself into a research institute and a public museum, with a set of institutional support systems underpinning the dual mission.

The Research Institute

The research institute is responsible for the care of—and addition to—collections as well as the conduct of active research.

Natural science and anthropology collections are a key element in the nation's research infrastructure. Field Museum collections exceed 16 million specimens and are of international significance in their breadth, depth, and quality. We will selectively add to these collections in our areas of strength in anthropology, biology, and geology. We will make the collections more accessible through improved conservation, adequate storage, computerization and inter-institutional loans.

Natural science and anthropological collections based research is fundamental to the life, environmental, and social sciences as well as to the arts and humanities. Field Museum staff and research associates will continue to engage in fundamental research in anthropology, geology, and biology. We will focus our research efforts on two principal areas:

* *Evolutionary Biology,*
* *Anthropology*, with particular emphasis on the nature of socio-cultural change and stability in the evolution of ethnic diversity.

We will also be an active participant in graduate and undergraduate education in Chicago and the nation.

The Public Museum

With one of the largest public museum spaces in the United States, Field Museum serves a large and diverse visitor constituency with a wide range of exhibits and programs. To provide even more varied experiences to its visitors, the Museum has adopted a new approach to exhibits and programs which involves three different but interrelated formats:

* *Informal, interactive exhibits and programs* which will be directly accessible to virtually any visitor.
* *Major thematic exhibits* which will provide broad overviews of natural history subjects and will highlight the Museum's collections.
* *Study halls* which will make available in depth resources on specific subjects for the visitor seeking a more comprehensive treatment of the subject matter and collections.

To enhance visitor use of the Museum, we will also build on our strong program of school services and initiate a community outreach effort to help the Museum better reach the broadest spectrum of Chicago's people. In addition a major marketing initiative will be undertaken to increase awareness of the Museum and to foster the perception of Field Museum as human, approachable, and fun.

Institutional Support

To fulfill its dual mission the Museum requires support from a range of human and financial resources within and outside the Museum.

Herpetologist Robert F. Inger (standing) and visiting scientist Yang Datong, of the People's Republic of China, view frog specimens in collection storeroom. The Department of Zoology hosted nearly 1,500 professional visitors from 1981 to 1985. William Burlingham photo.

* *Private support:* In addition to strengthening its support from the business community and foundations, Field Museum must dramatically increase the number of individual givers to the Museum. To increase individual support of the Museum, we will institute a more active membership program to involve more people in the Museum and interest groups to build their commitment.
* *Public support:* Continued support from the Park District is essential, along with support from the State of Illinois.
* *Earned Income:* We will increase earned income by increasing the number of visitors, our charges, and by improving the museum services for which we charge.
* *Endowment:* We will maintain the endowment's current percentage of our support through capital contributions and investment management.
* *Joint programs:* Because Field Museum's financial resources for research are limited, we must strengthen our relationships through joint programs with universities, national laboratories and related governmental research agencies.

To marshall these resources the Museum has embarked on an ambitious capital campaign—Time Future from Time Past.

These Centennial Directions require dedicated staff, volunteers and friends who are committed to being the best. Armed with a vision and a realistic plan, Field Museum will meet the challenge of its second century.

INTRODUCTION

In 1993 Field Museum of Natural History will celebrate its hundredth anniversary. In this first century, the vision and commitment of its founders and their successors have made Field Museum one of the four great natural history museums. To ensure that the Museum will continue to build on its accomplishments in its second century, Museum staff and trustees undertook a centennial planning process, with the assistance of McKinsey & Company, Inc.

That participatory process focused on what the Museum must do to achieve excellence in its two basic missions—as a research institute for the study of natural history and as a public museum devoted to stimulating interest in and building knowledge of natural history. Specific programmatic and financial goals have been formulated, and the Museum's Board of Trustees has begun a capital funding campaign designed to bring those goals within reach and to help the Museum achieve a leadership role in research and public education.

This Centennial Directions statement reports on the present state of the Museum and sets forth the actions the Museum must take to:

* Build its position as an excellent research institution in the mainstream of basic research in the United States
* Extend its influence as a public museum committed to public understanding of natural history
* Provide the full range of institutional support required to carry out these two major missions

The following sections of this report discuss each of these challenges in turn.

An Excellent Research Institution of Natural History

Field Museum of Natural History holds a major place in natural science research in the United States. Its collections are renowned nationally and internationally for their breadth, depth, and quality. Collection-based research is vital to the nation's research effort and makes scholarship a thriving force in the life of the Museum.

Maintaining and building on its excellence as a research institution will require major ongoing efforts by the Museum. Simply maintaining the existing collections is in itself an enormous undertaking; building the collections and associated research efforts are particular challenges in view of the limited funding now available for basic research. To advance its position as a leading research institution, Field Museum must work to:

* Maintain and build selected collections
* Position its research programs as key contributors to the mainstream of basic research.

Maintain and Build Collections

Natural science and anthropological collections are a key element in the nation's research infrastructure. These cataloged specimens and artifacts provide primary source material for exploring the history, variety, limits, and possibilities of the world's flora, fauna, and people. With more than sixteen million artifacts and biological specimens, Field Museum's collections are an irreplaceable international resource.

They rank third in the nation in size, surpassed only by the National Museum of Natural History of the Smithsonian Institution and the American Museum of Natural History. Field Museum's collections rank second in breadth. They are grouped into three major categories: anthropology, biology (including paleontology), and physical geology (Exhibit 1, page 10). Although Field Museum rarely holds the largest major collection of a particular type, its holdings almost always rank among the top three or four in the nation. The anthropological holdings number over 600,000 items and are the fourth largest collection in the nation. Plant specimens numbering over two million constitute the fifth largest collection nationwide. Our animal and plant fossil collections are among the top three or four nationally, and our zoological specimens number more than twelve million and rank third or fourth in the United States.

The Museum's large, in-depth collections are recognized by our national and international peers through their use of the collections and support of our grant proposals. For both research and exhibition, the Museum is

a net lender nationally and internationally, loaning many more objects than it borrows. In the past five years, the Museum has hosted professional visits by 4,904 scientists (Exhibit 2, page 11). In addition, the Biological Research Resources Program of the National Science Foundation (NSF) recognizes Field Museum as a major scientific resource. Field Museum ranked fourth in the nation with NSF dollar awards in recent years, with collection grants totaling more than $2.8 million, or 8.1 percent of the NSF budget for systematic collections (Exhibits 3, 4, page 11). Scholars at universities and other museums—the primary users of museum collections—constitute the grant proposal review community.

The quality of a collection is a function of its depth, the amount and quality of the data base associated with the objects, the accessibility of the objects and the data base, the conservation of the objects, and their storage environment. By these criteria, Field Museum's collections are of world stature. Our staff has provided national leadership in collection preservation and management. We were among the first to use computers and data base software for collection management; we have established modern conservation facilities for anthropological material; and we have increased and upgraded collection storage space.

Moving into the Museum's second century, we must continue to strengthen our leadership in collection preservation and management. Caring for specimens and related data bases is a significant challenge essential to maintaining the Museum's collection strength. In addition, we must make the collections as accessible for scholarly research and educational use as possible. Just as important, we must add selectively to our collections in areas of particular strength, taking into account not only our own long-term institutional collection objectives but national and regional objectives as well.

To meet these challenges we plan to:

* Work with peer research institutions, government agencies, and the national scientific community to develop a plan for national and regional centers of collection excellence in natural science and anthropology. The focus of these centers will guide us in adding to Field Museum's collections.
* Add selectively to collections in Field Museum's clearly established areas of strength through fieldwork, purchases, and gifts in kind.
* Provide adequate staffing for conservation and management of the collections.
* Provide modern computer and research equipment and adequate storage facilities for collection conservation, management, and research.
* Maintain and add selectively to our library—one of the premier natural science and anthropological libraries in the Western Hemisphere.

Position Research Programs in Mainstream

Natural science and anthropological collection-based research is fundamental to the life, environmental, and social sciences as well as to the arts and humanities. In addition to its contribution to pure science, basic collections research helps lay the foundation for advances in agriculture, medicine, environmental control, and natural resource development.

Field Museum staff and research associates engage in fundamental research in anthropology, geology, and biology. The Museum is a basic research institution in its own right and a vital participant in graduate and undergraduate education in Chicago and the nation. Our research is primarily collection-oriented and observa-

Anthropologist John Terrell studies why the people of the Pacific islands are so diverse in biology, customs, and language. William Burlingham photo.

Exhibit 1

Collection Size

Collection, January 1, 1986	Number of Specimens	National Rank in Size
ANTHROPOLOGY		
Central American Archaeology	11,724	5
Central American Ethnology	2,633	3
South American Archaeology	16,882	4
South American Ethnology	7,867	4
North American Archaeology	134,681	3
North American Ethnology	99,462	3
Human Skeletal Collection	4,750	4
Polynesian Ethnology/Archaeology	5,265	4
Micronesian Ethnology/Archaeology	11,263	4
Asian Archaeology	1,196	10
Asian Ethnology	50,927	6
Sumerian Archaeology	25,202	3
Near Eastern Ethnology	665	6
Old World Prehistory	161,255	2
Classical Archaeology	11,780	4
African and Madagascar Ethnology	16,423	3
Australian Ethnology	2,126	2
Melanesian Ethnology	36,012	1
Subtotal	600,113	
BOTANY		
Algae	77,631	3
Fungi	79,734	12
Lichens	51,780	8
Bryophytes (Mosses)	150,286	4
Ferns	92,000	4
Seed Plants	1,865,402	5
Subtotal	2,316,833	
GEOLOGY		
Physical Geology	62,227	3
Invertebrate and Plant Paleontology	380,784	3
Vertebrate Paleontology	129,781	4
Subtotal	572,792	
ZOOLOGY		
Invertebrates	3,235,000	6
Insects	7,050,000	10
Fishes	1,600,000	7
Amphibians and Reptiles	234,924	4
Birds	373,000	3
Mammals	126,680	7
Subtotal	12,619,604	
GRAND TOTAL	16,109,342	

Exhibit 2

Scholarly Use of Field Museum Collections 1981-1985

Department	Number of Loans	Number of Specimens Loaned	Professional Visitors
Anthropology	127	4,974	1,429
Botany	1,180	135,567	973
Geology	912	10,133	1,010
Zoology	1,516	200,427	1,492
Totals (5 yrs)	3,735	351,101	4,904

Exhibit 3

National Science Foundation Biological Research Resources Program Summary of Awards 1972-1984

		Award
1.	Harvard University	$5,260,000
2.	American Museum of Natural History	$3,869,000
3.	California Academy of Sciences	$3,173,000
4.	FIELD MUSEUM OF NATURAL HISTORY	$2,882,000
5.	Academy of Natural Sciences of Philadelphia	$2,704,000
6.	New York Botanical Garden	$2,484,000
7.	University of Michigan	$2,481,000
8.	Missouri Botanical Garden	$2,112,000
9.	Bernice P. Bishop Museum	$1,890,000
10.	Los Angeles County Museum	$1,636,000
	Total	$28,491,000

Exhibit 4

National Science Foundation Biological Research Resources Program 1972-1984 Support for Field Museum Biological Collections

Collection	National Rank*	Dollar Amount
Botany	6	$537,000
Mollusks	-	—
Insects	4	$808,000
Fishes	5	$370,900
Reptiles	6	$141,400
Birds	6	$165,000
Mammals	2	$548,200
Fossil Invertebrates	-	—
Fossil Vertebrates	4	$311,800
	Total	$2,882,300

**rank by total dollars awarded*

Exhibit 5

National Science Foundation Systematic Biology Program Awardees Top Ten Recipients 1975-1979

(in order of total amount awarded)

1. University of California, Berkeley
2. University of Texas
3. Harvard University
4. Missouri Botanical Garden
5. University of Michigan
6. New York Botanical Garden
7. University of Kansas
8. Academy of Natural Sciences of Philadelphia
9. FIELD MUSEUM OF NATURAL HISTORY
10. University of Connecticut

Note: The rank of institutions is based on the total dollars awarded to individual researchers at the institutions.

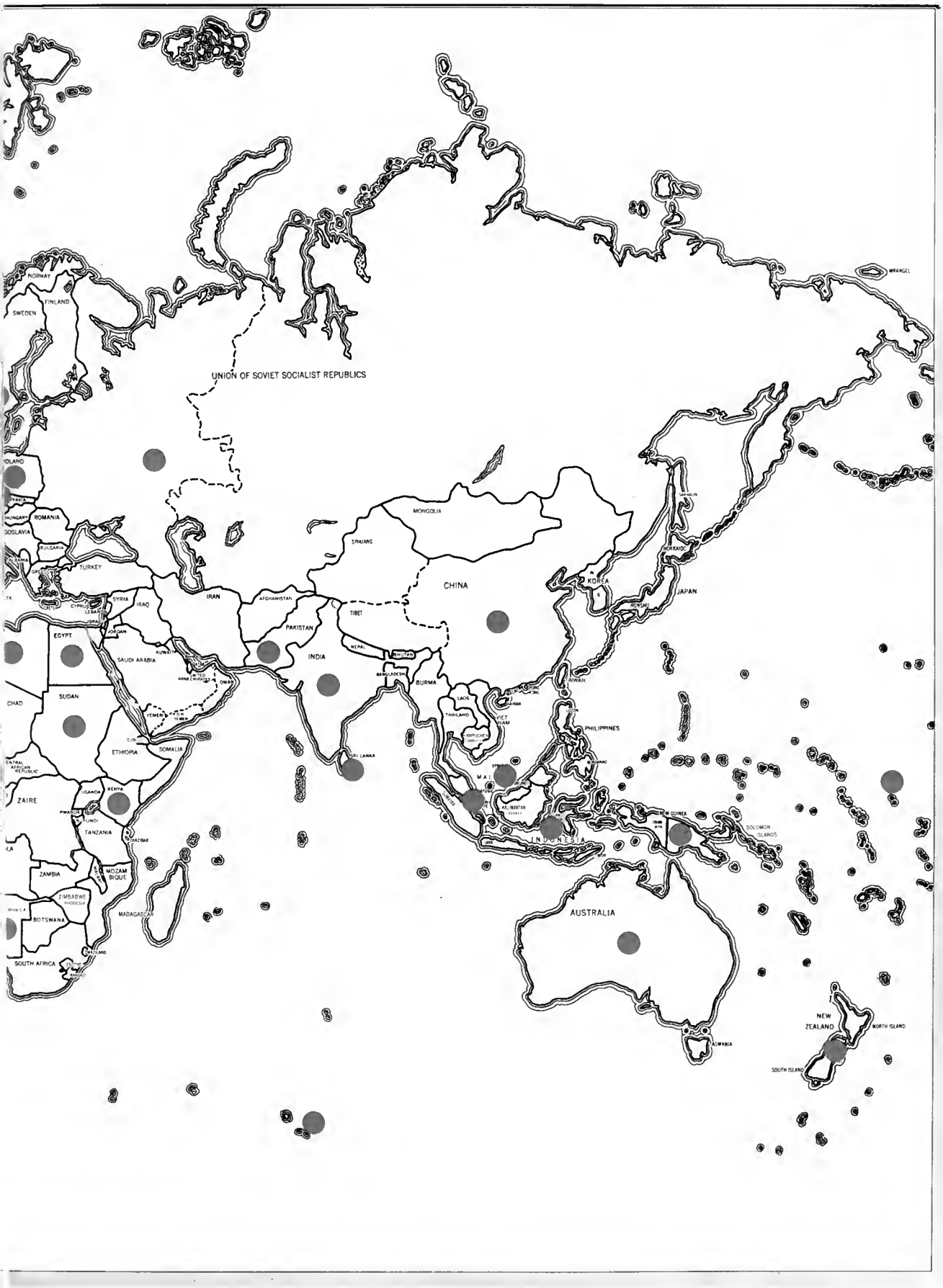
Exhibit 6

Grants Awarded to the Museum's Curatorial Departments 1979-1985

	Anthropology	Botany	Geology	Zoology	Total
RESEARCH					
Government	5	15	9	20	49
Private	0	2	2	20	24
COLLECTION					
Government	13	3	3	6	25
PUBLICATIONS/ SYMPOSIA					
Government	2	0	5	0	7

Exhibit 7


ALASKA
CANADA
UNITED STATES
MEXICO
CUBA
BELIZE
NICARAGUA
VENEZUELA
COLOMBIA
ECUADOR
PERU
BRAZIL
BOLIVIA
CHILE
PARA-GUAY
ARGENTINA
URU-GUAY
ICELAND
UNITED KINGDOM
FRANCE
SPAIN
PORTUGAL
ALGERIA
MOROCCO
MAURITANIA
MALI
UPPER VOLTA
IVORY COAST
GHANA
NIGERIA
Countries Visited
for Research Purposes
by Field Museum Scientists
1975-1985


NORWAY
SWEDEN
FINLAND
UNION OF SOVIET SOCIALIST REPUBLICS
WRANGEL
POLAND
ROMANIA
BULGARIA
TURKEY
SYRIA
IRAQ
IRAN
AFGHANISTAN
PAKISTAN
MONGOLIA
CHINA
TIBET
NEPAL
BHUTAN
INDIA
BANGLADESH
BURMA
KOREA
JAPAN
HOKKAIDO
TAIWAN
LAOS
THAILAND
PHILIPPINES
EGYPT
SAUDI ARABIA
SUDAN
CHAD
ETHIOPIA
SOMALIA
YEMEN
OMAN
SRI LANKA
ZAIRE
KENYA
UGANDA
TANZANIA
ZAMBIA
MOZAMBIQUE
ZIMBABWE
BOTSWANA
SOUTH AFRICA
MADAGASCAR
INDONESIA
NEW GUINEA
SOLOMON ISLANDS
AUSTRALIA
NEW ZEALAND
NORTH ISLAND
SOUTH ISLAND

tional or theoretical in nature. Consequently, most of our research programs are either active field studies (expeditions), which add to the Museum's collections, or studies of museum holdings. In addition, in support of exhibitions and education, we do review research for exhibit outlines, catalogs, and public lectures.

Field Museum has a significant record of expeditions world-wide. In the past ten years alone, 68 Field Museum researchers have conducted 216 field studies in 54 countries (Exhibit 7, page 12). These field efforts have been the basis of major ongoing research programs and have been instrumental in building the collections and their associated data bases.

In scholarly publication—an indicator of achievement in basic research—our record is similarly impressive. Our research staff have reported on their findings in 487 journal articles, monographs, and books over the past seven years. The quality of the research is evidenced by its publication in peer-reviewed journals and by the amount of reference it receives. Papers by Field Museum curators were published in 90 different peer-reviewed journals over the last nine years. In addition requests for back issues of *Fieldiana* (Field Museum's research journal) and citations indicate that many of our major monographic works are heavily used.

Over the past five years, Field Museum curators have served on more than 60 doctoral thesis committees, and 53 graduate students have worked in residence at the Museum.

Grants are another form of recognition of research quality. Field Museum scholars received 73 research grants in a six-year period (Exhibit 6, page 11). As a group, Field Museum biologists were ranked ninth in the nation (out of 352 groups) in funding received between 1975 and 1979 from the Systematic Biology Program of the National Science Foundation (Exhibit 5, page 11).

Field Museum's collection resources and strong reputation among its peers are tremendous assets. To achieve its potential in research, the Museum needs to stand squarely in the mainstream of the American research and academic communities. Field Museum faces a significant challenge in sustaining a strong mainstream position in research, because research funding is usually geared to degree-granting institutions. With a small professional staff, the Museum must have clear research objectives and must collaborate with other scholars and institutions to strengthen, expand, and finance collection-based research.

To ensure that its limited research resources are used to maximum benefit, Field Museum will focus research efforts on two principal areas:

* *Evolutionary Biology.* Our collections and research, together with the University of Chicago and the University of Illinois (Chicago), make our city one of the world's premier research centers in evolutionary biology. The field encompasses some 20 million organisms and a half billion extinct species. Basic research in evolutionary biology involves: recognizing, describing, and naming each of these organisms; discovering its specific place and function in the diversity of life forms; investigating the causes and consequences of that diversity; and understanding the interdependence of living things with each other and their physical environment.
* *Anthropology.* Within anthropology, Field Museum places particular emphasis on the nature of sociocultural change and stability and the evolution of ethnic diversity. The anthropological collections provide material evidence of humankind's societies and technologies, and thereby shed light on the mechanisms of transmission, evolution, and change in culture and society.

In addition to defining these two areas as a focus for its research programs, the Museum has established a detailed agenda for its research effort:

* To attract and retain staff of the highest caliber, and to provide for them an environment that stimulates commitment to excellence.
* To close the gap between available research funds and program needs.
* To collaborate, formally and informally, with comparable institutions and Illinois colleges and universities on research and educational efforts, including joint appointments and programs, adjunct research and teaching relationships, postdoctoral fellowships, and sharing of equipment. Such collaboration has a significant role to play in positioning the Museum as a major research institution.
* To encourage research on—and exhibition of—underutilized collections through research associates and visiting curators. Doing so will help advance knowledge on topics that are not necessarily in vogue at present and will provide exposure for the collections.
* To encourage student use of collections through graduate dissertation fellowships and graduate and undergraduate research projects. The resulting links to

academic institutions will help keep the Museum in touch with major currents in research.

* To enable exceptional visiting scholars to study and work at Field Museum.
* To provide for the publication of major works based on Field Museum collections and research.

* * *

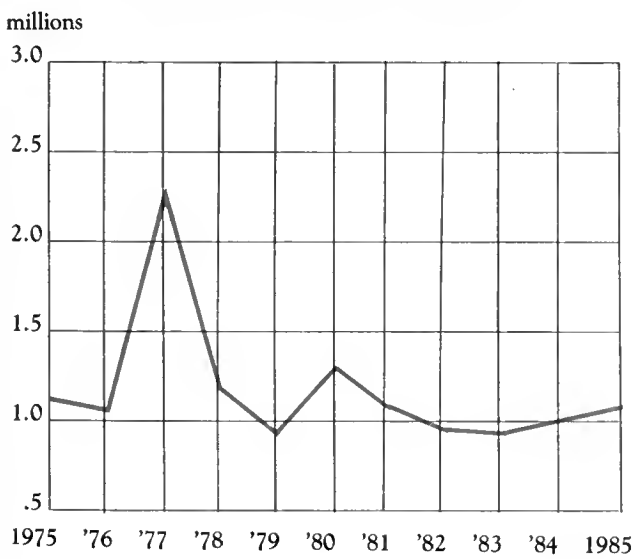
Field Museum looks forward to its second century with a drive to continue to expand its contribution to natural history research. Maintaining its excellence in collections and standing in the mainstream of natural history research will help Field Museum make a major research contribution while helping us better serve the people of Chicago and the Midwest.

A Dynamic Public Museum

Field Museum is one of the largest public museums in the United States and serves a large and diverse public with a wide range of programs. Approximately half of the Museum's 870,000 square feet is utilized for exhibits, public programming, and assembly space. The Museum's exhibits and public programs deal with the world's cultures and physical environments. A full 54 percent of the Museum's current exhibits are focused on anthropology, and nearly all special exhibits have been arts and humanities-oriented. The Museum also offers a broad range of festivals, tours, workshops, performances, lectures, and courses for preschool through adult audiences. During 1985, 270,619 of our visitors participated in 720 special public programs. Since 1927, more than one million people annually have visited Field Museum—far more in 1933-34, during the Century of Progress Exposition, and in 1977, during the showing of "Treasures of Tutankhamen" (Exhibit 8).

Exhibit 8

Field Museum Annual Attendance



Field Museum serves a wide variety of constituencies in and around Chicago:

* *Family visitors,* whether from the Chicago metropolitan area or tourists from the Midwest and beyond, are predominantly a well-educated audience coming to the Museum for a relatively undemanding and entertaining educational or cultural experience. Although they arrive at the Museum as a loosely organized group, family members have different interests, needs, and attention spans, which the Museum must address.
* *Schoolchildren and teachers* still see museums primarily as a place to break out of the classroom for the annual spring field trip. Yet the limited resources of the schools and the demands of the humanities, art, science, and social studies curricula suggest that the rich resources of the Museum can be an increasingly important educational complement and support to classroom work.
* *Underserved inner-city people* tend not to feel welcome at museums and do not see them as relating to their daily lives. However, Field Museum's resources could be organized to meet real community, family, and individual needs for education and recreation.
* *Serious students, collectors, and amateur scholars and scientists* could be the most focused users of the Museum's vast resources. But as presently organized, the Museum is difficult to grasp and penetrate and does not specifically address this vital constituency.

In serving these groups of people, Field Museum seeks both to entertain and to educate—much as does educational television, now the primary source of natural history information for most of the general public.

Demographic shifts in greater Chicago, combined with the increasing array of leisure options available, pose distinct challenges to Field Museum in serving the public. For example:

* Although most visitors view Field Museum positively, they do not see it as particularly distinct from other museums. This lack of a distinctive image is a problem, because Chicago's museum-going population is not

growing, and Field Museum must therefore compete with the city's other museums for a limited number of visitors.

* Many visitors see the Museum fairly narrowly, as the home of dinosaurs, mummies, cavemen, and North American Indians—suggesting that the Museum has not communicated the breadth of its collections and expertness.
* The suburban population of the collar counties is growing, but their visits to Field Museum may be declining as suburbanites increasingly spend their leisure time in their own communities. As the suburbs become more established, they develop institutions of their own. Suburbanites are discouraged from visiting the central city because of travel time, congestion, cost, and perceived lack of security.
* With the continued growth of the Hispanic community, the majority of Chicago's population is Black and Hispanic—two groups that have historically been underserved by the Museum and underrepresented among its visitors.
* The imposing scale and classical formality of the building, the established position of the institution in the community, and the solemn tone of the Museum create the impression of a somewhat aloof and unapproachable place—in direct contrast to the Museum's recent emphasis on informal and accessible programming.

Meeting these challenges is essential to tapping the vitality of Field Museum and making it both an excellent public museum of natural history and a wonderful place to visit.

Field Museum aspires to be the institution that defines "natural history" for the people of greater Chicago. To move toward this goal, the Museum will:

* Renew its major thematic exhibits; to build in-depth educational resources, and to offer informal exhibits and programs, providing direct, hands-on experiences with natural history materials and themes.
* Develop programs that address real community and individual needs, appealing to people of various levels of knowledge, from casual beginners to dedicated hobbyists, collectors, and amateur scholars and scientists.
* Organize the Museum's vast information and human resources to make them more understandable, accessible, and useable.
* Build an audience and staff that more closely reflect the economic and ethnic diversity of Chicago, reaching out to underserved communities.
* Lighten the public face of the Museum, making it more human and approachable.

Key to achieving these goals will be a flexible and dynamic approach to exhibits and public programs. During the next few years, the Museum will concentrate on implementing this approach rather than mounting major special exhibits. This approach will be supported and reinforced by a variety of other initiatives—school programs, community outreach efforts, and a more focused marketing approach. In the remainder of this section we outline the Museum's new approach to exhibits and then describe the supporting initiatives.

A New Approach to Exhibits and Public Programs

To be an effective complement to educational television in entertaining and educating the public on natural history, Field Museum needs to be an exciting place that offers a range of challenging experiences. While television can effectively overcome the limits imposed by geography and time, a museum offers a chance to see and interact with real materials—a direct experience rather than an observation via the camera. It is also one of the few user-paced, free-access learning and cultural experiences available in the modern world. A museum is truly a place of individual learning.

To reach the public with such experiences, exhibits and programs need to be:

* Adaptable to the changing needs of the public
* Interesting and useful to people with different backgrounds and levels of interest in the subject matter
* Useful as resource centers for the serious student, hobbyist, and collector, who seeks a more comprehensive treatment of the subject or theme
* Able to give an overview of subjects and themes to millions of people.

To meet these diverse and often conflicting requirements, Field Museum plans to organize its public space into three different but interrelated formats:

* *Informal, interactive exhibits and programs,* which will be directly accessible to virtually any visitor
* *Major thematic exhibits,* which will provide broad overviews of their subjects and highlight the Museum's collections

* *Study halls,* which will make available in-depth resources on specific subjects, for the visitor seeking a more comprehensive picture of the subject matter and collections.

In the remainder of this section we discuss each of these formats.

Informal Exhibits and Programs

Concentrated in the arcade spaces surrounding Stanley Field Hall and scattered throughout other exhibit areas, informal exhibits and programs will cover single concept, nonsequential themes. They are intended to be accessible to even the most casual visitor and to involve visitors in activities and direct experiences. They will use few labels, specimens, or artifacts, relying instead on interactive models, functional replicas, expendable materials, and staff to tell their story. They will be engaging, informal, playful, messy, noisy, and brightly lit.

Informal exhibits and programs can be quickly developed and revised at low cost. They will change, wear out, get used up, or simply be replaced by other, more exciting materials and activities. The Museum plans to begin putting some of these activities in place very soon. Examples include:

* Exploring issues of size and scale—why various living things are the sizes they are
* Stringing beads, weaving, scraping skins, making and using primitive tools
* Sorting and classifying bones, birds, leaves, and insects
* Handling live and preserved animal and plant materials
* Experiencing an earthquake and manipulating a plate tectonic model
* Building an adobe or wattle and daub wall
* Playing a seal-hunting simulation game
* Participating in an archaeological dig
* Playing moccasin, ring, and pin games
* Cooking and tasting foods from other cultures
* Watching and listening to informal presentations of music, theatre, dance, puppetry, and storytelling
* Looking at how parenting and nurturing take place in various parts of the plant and animal kingdoms. Such an exhibit could be part of a play area for preschool children, available as a service to family visitors.

Major Thematic Exhibits

These exhibits will be developed around major themes in natural history and provide a broad overview of those themes, drawing on materials from several subject areas or Museum departments. They are intended to present sequential topics in a dramatic and memorable way, appealing to the interested public. These exhibits will seek both to educate and entertain people with varying levels of prior knowledge and interest. The emphasis will be on displaying materials, conveying information, and asking penetrating questions. These exhibits will not carry the burden of providing the exhaustive detail needed by the more serious student.

Major thematic exhibits will be set in carefully designed environments that include controlled lighting, sound, and climate. They will reflect the strengths of Field Museum collections and will draw heavily on those collections. The exhibits will also make use of models, habitat groups, dioramas, media, simple interactive devices, and headline labels. These exhibits will require substantial development time and capital investment, but lifetime costs will be reasonable because the exhibits will be revised relatively infrequently. However, thematic exhibits can and should be revised and updated as new information becomes available and new public interests emerge.

Themes for major exhibits might include:

"Pacific Islands"
"Africa"
"Mexico and Central America"
"Adaptation and Evolution"
"Geologic Change"

Study Halls

Occupying the outermost ring of public spaces but immediately adjacent to the thematic exhibits, the study hall areas will afford the intrigued casual visitor, serious student, or hobbyist an opportunity for concentrated, in-depth and detailed exploration of collections, kits, books, periodicals, photo archives, videotapes, recordings, and computer data bases. In conjunction with the study hall, a staff member can facilitate access to other human, programmatic, informational, and material resources at Field Museum and other metropolitan Chicago institutions. By providing this in-depth resource,

study halls will free the thematic exhibits to focus on an introduction and overview of the subject rather than an exhaustive presentation. In addition, some curatorial activities, including packing and unpacking for expeditions, can be done in the study halls, so that the public can see and better understand the activities that go on behind the scenes at the Museum. These areas will be comfortable, informal, quiet, multi-leveled spaces with lots of seating and subdued natural lighting from reopened windows looking out onto the park.

Supporting Initiatives

While exhibits and general public programs are central to the vitality and appeal of Field Museum, several other initiatives are needed to reinforce and broaden its usefulness:

* School services that will help the Museum complement the formal educational system and further the students' interest in and understanding of natural history.
* Community outreach efforts, to help the Museum better serve the broadest spectrum of Chicago's people.
* Marketing initiatives to increase awareness of the Museum and to foster the perception of Field Museum as human, approachable, and fun.

More than 200,000 zoological specimens in the Field Museum collection were loaned to researchers at other institutions between 1981 and 1985. William Burlingham photo.

School Services

Illinois law mandates that all Illinois students and teachers be admitted free to museums located in public parks, and Field Museum welcomes them. The Museum operates a number of formal educational programs geared to Chicago-area schools. School attendance has ranged from a high of 384,944 in 1969 to a low of 176,352 in 1981. New initiatives have increased attendance. During 1985 over 4,500 school groups, composed of 219,607 students and teachers, visited Field Museum to augment their classroom studies. Free loans of dioramas and experience boxes were made to over 1,500 teachers and community organizations to prepare for their Museum visit or for in-school study.

To improve the school programs, the Museum must strengthen its relationships to elementary and secondary school curricula and to relevant programs of community and natural history organizations. Specifically, the Museum should:

* Increase Museum usage training programs for teachers and broaden them to include leaders of educational, community, and natural history organizations
* Work more closely with schools and with community and natural history organizations on joint curricular and program planning
* Develop more classroom kits and other educational materials for use away from the Museum.

Community Outreach

Although Field Museum serves a wide variety of constituencies, it has a special responsibility to the people of Chicago. We need to do a better job of serving all of Chicago's people, and the Museum therefore plans to establish an outreach program. This program will seek to introduce the Museum to non-users, increase their comfort with it, and get Museum resources out where they can be used to meet day-to-day community needs. The program's mission will be to build long-term links to community agencies, such as boys and girls clubs, Y's, branch libraries, preschool and after school day care centers, senior centers, settlement houses, day camps, recreation centers, playgrounds, and park programs.

The exact nature of the outreach programs will depend on the needs of each community. Programs might include:

* Offering agency staff training in the use of resources from Field Museum and other cultural institutions
* Circulating kits and other materials for use at those sites
* Conducting museum-staffed programs at the agencies
* Scheduling a separate family open house every year for each target community
* Building employment opportunities at the Museum for members of those communities
* Developing an advisory committee for each community.

Marketing

The primary goals of the Museum's marketing effort are to attract more visitors to Field Museum and to broaden their use of the Museum's resources. The first steps toward this goal are to make exhibits and programs more dynamic and to broaden their appeal. The role of marketing in meeting these goals is to build public awareness and recognition of the Museum and to create a positive perception of the Museum as very approachable. In seeking to build this perception, marketing efforts should:
* Present Field Museum as an exciting and contemporary center of natural history, focused on the world's cultures and physical and biological enviroment.
* Convey the excitement and learning that comes from a visit to or an association with the Museum.

While improvements in exhibits and programming will generate word-of-mouth support, achieving these goals requires coordination of all public information materials issued by Field Museum, so as to present a unified and consistent image to the public. The Museum should therefore develop a complete public communication program, including:
* A fresh, more coherent and welcoming Museum identity program, including logo, typography, and editorial style.
* Essential visitor communication tools:
  - √ Field Museum Guidebook (for sale at booths, store)
  - √ Exhibit guides
* Outside directional and informational signage and banners.
* Expanded media coverage:
  - √ Paid advertising (radio, TV and print)
  - √ Public service announcements (radio, TV, and print)
  - √ Print articles and features
  - √ Calendar listings and events listings
  - √ Special film and radio projects
  - √ More direct personal involvement of Chicago and national media personalities with the Museum.
* Direct mailings from the Bulletin, Education, Development, and Public Relations Departments. To be cost efficient, direct mail should be designed, where possible, to generate measurable results, *e.g.*, return replies, percentage response or return, tracking of phone call response to the mailing.
* Direct contact via letters, phone calls, telethons, and personal relationships.

In utilizing these marketing tools, we will focus on the needs of each market segment and the most appropriate and cost-efficient means of reaching that segment.

* * *

Field Museum enters its second century with many challenges ahead. By meeting these challenges we hope to offer the public a more exciting and accessible learning experience, drawing visitors at all levels into the Museum and reaching out to the people of Chicago and beyond.

Institutional Support

To fulfill its dual missions, the Museum requires support from a range of human and financial resources within and outside the Museum. Providing adequate institutional support poses several challenges:
* Field Museum's Development function needs to broaden its base of donor support, moving beyond fundraising to institutional advancement.
* Finance and Museum Services can greatly increase its contribution to the fundamental roles of the Museum by improving many of the services it offers—from food service to computer services.
* The entire Museum must continue to challenge itself to achieve fiscal soundness—increasing the institution's revenues while maintaining or reducing costs and setting priorities for expenditures.

* All departments within Field Museum must build their ability to work cooperatively in support of the Museum's dual mission, recognizing that people are the Museum's greatest organizational resource.

In the remainder of this section, each of these four points is discussed in turn.

Development as Institutional Advancement

The development effort needed at Field Museum is more than fundraising; it is institutional advancement—the process of repositioning Field Museum in the minds of its support constituencies as needing and deserving of increased support. Increasing understanding, involvement, and support are the objectives of this process. In addition, the Development staff must conduct a major capital campaign while maintaining current levels of annual giving.

If the development program is to adopt such a thrust, this new concept and attitude must extend beyond our Development staff to pervade the entire Museum. Everyone must be a fund raiser and friend raiser for Field Museum. Board members, staff, and volunteers must work together in identifying opportunities for improvement; in educating and involving various constituencies; and in seeking increased project support and funds for capital and operating support. In addition to broadening the staff's commitment to the Development function, the Museum must broaden its base of leaders, volunteers, members and donors.

To compete effectively for time, attention, and financial support, Field Museum must continue to shift its emphasis from general donor programming toward more targeted constituency development. Specifically, the Museum must:

* Define its support groups more clearly and create programs and activities more related to their special interests.
* Strengthen its communications with these groups and with the public at large, locally and nationally.

Targeted constituency development will require considerably more planning, testing, program development, and administrative organization than general donor programming. The shift to a more targeted effort will not happen overnight but such a shift is essential for Field Museum, given current constituent development patterns here and at other institutions.

As part of its effort to effect this shift in development, Field Museum has articulated several specific goals for its Development function:

* To expand the scope of Field Museum's constituency development efforts by:
  - √ Broadening business solicitation to include mediumsized commerce and industry prospects
  - √ Broadening solicitation to more individuals, using more effective telephone, personalized mail, and person-to- person contact to enlist donors and upgrade giving patterns.
  - √ Broadening membership to 40,000 and creating incentives for involvement and support by members.
* To personalize development efforts by:
  - √ Maintaining intensive personal contacts and communication with present, deferred, and prospective donors
  - √ Organizing and staffing Museum interest groups that can provide learning experiences for donors and staff and can play crucial advisory, advocacy, and support roles in specific areas. The Women's Board and Founders' Council are stellar examples.
  - √ Emphasizing Museum visits as well as instituting an outreach program to bring our message directly to selected groups.
  - √ Assisting Museum staff in applying for grant support
  - √ Maintaining government relations programs at all levels
  - √ Expanding research or project funding possibilities
  - √ Reporting regularly and comprehensively to grantors on funded projects
* To cultivate gifts in kind to the Museum collections as an essential complement to field trips in building collections

More supportive Finance and Museum Services

Finance and Museum Services includes:

* Income-generating visitor centers (the Museum Stores, Special Events, Food Services)

* Support Services (Facilities Planning and Operation, Visitor Services and Security, Archives)
* Budget and Control (General Services, Purchasing, and Finance)
* Human Resources.

Finance and Museum Services has several basic responsibilities which include:

* Providing the essential services necessary to operate and maintain the Museum—including heating, lighting, cooling, cleaning, maintaining, renovating, equipping, servicing, and protecting the Museum's nearly one million square feet of research and public space
* Providing hosts for the Museum's visitors, along with other services that should be appealing in their own right as well as complementary to the Museum's public programs
* Financial planning, budgeting, managing, and reporting
* Providing Museumwide administrative computer service.

To fulfill these responsibilities as effectively and efficiently as possible, Finance and Museum Services has set goals for providing services to Museum visitors and support to other Museum departments. To help attract visitors and donors to the Museum, Finance and Museum Services has formulated the following goals:

* To make Museum Stores more appealing to visitors by:
  - ✓ Expanding Museum Stores activities (*e.g.*, the Children's Store, special exhibit sales, outpost stores, catalog sales, store promotion campaigns)
  - ✓ Providing distinctive and appealing natural history merchandise and books
  - ✓ Providing visible, accessible, and adequate space to display merchandise attractively and to allow for comfortable visitor shopping.
* To improve the Museum's food service by:
  - ✓ Working actively and imaginatively with McDonald's food service and the Museum Public Programs departments
  - ✓ Improving the space, refreshments, and service in the vending area.
* To expand the Museum's special events program in order to:
  - ✓ Increase visits by encouraging conventions and business groups to hold events at the Museum
  - ✓ Attract groups from nearby areas and states to visit the Museum
  - ✓ Increase use of Museum facilities outside visiting hours so that the Museum serves fully as a citywide cultural center.
* To develop the vital visitor service role of the Visitor Services and Security Department, through training programs designed to enhance the staff's effectiveness as Museum hosts and guides.
* To develop training programs for Housekeeping and other departmental staff members who interact with the public, to make them more aware of their role in representing the Museum to the public.

In providing support for Museum operations and other departments, Finance and Museum Services has identified several improvements to be made. Their goals in providing support are:

* To improve planning and management of the Museum's physical plant by:
  - ✓ Reorganizing the Department of Facility Plan-

Botanist John Engel, specialist in liverworts (Hepaticae) of the Southern Hemisphere. As a group, Field Museum biologists were ranked ninth in the nation (out of 352 groups) in funding received between 1975 and 1979 from the Systematic Biology Program of the National Science Foundation. William Burlingham photo.

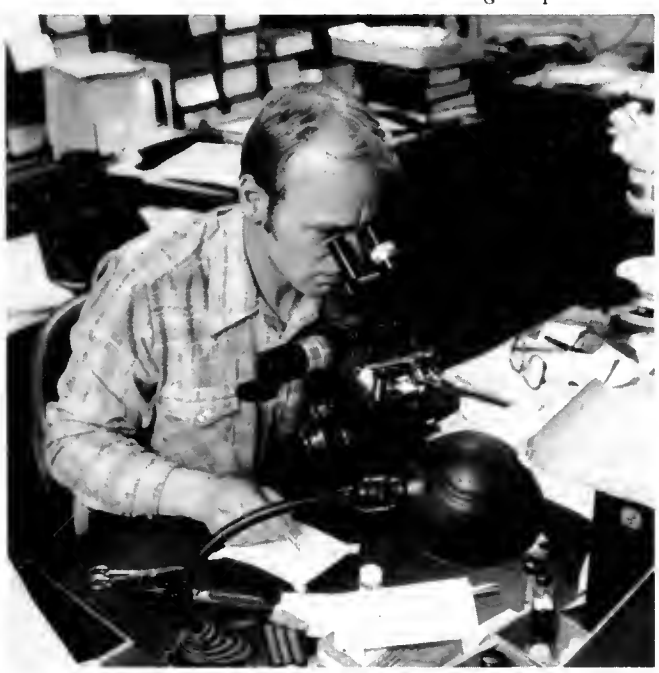
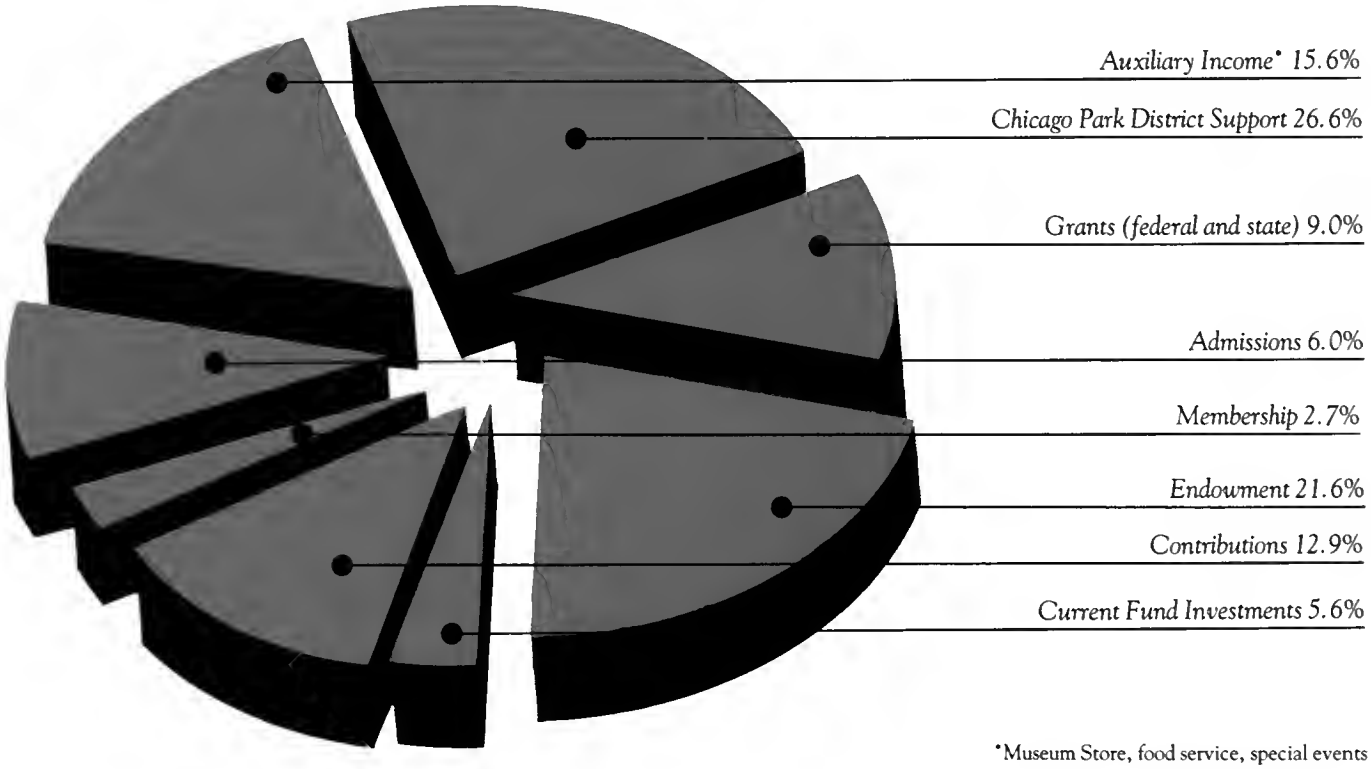


Exhibit 9

Sources of Support
For the Year Ended December 31, 1984



*Museum Store, food service, special events

ning and Operations to assume the additional responsibilities of capital campaign construction management while maintaining high standards of daily operation in its engineering, maintenance, and housekeeping sections

- √ Conducting studies of space needs and developing renovation and construction proposals and plans
- √ Preparing annual plans for energy utilization and Museum-wide capital expenditures.

* To work closely with Public Programs personnel to expedite completion of exhibits and to improve services to visitors.

* To develop and coordinate a risk management program to protect the Museum's assets and to minimize liability exposure, reviewing collections annually to ensure that security and insurance coverage are adequate, reviewing all public areas regularly to protect visitors against injury and the Museum against liability.

* To improve the overall safety and security of the Museum for everyone who visits or works there by:

- √ Monitoring Museum conditions that affect health and safety
- √ Continuing to improve security systems and security training programs.

* To improve equipment inventory control by implementing an effective identification system and a computerized equipment inventory system.

* To implement an improved equipment purchase approval system, including a special review for computer, word processing, and copy equipment.

* To improve the printing production process, includ-

ing defining project scope, developing budgets, and meeting schedules.

* To redefine the role of Museum archives to guarantee continued collection, maintenance, retrieval, and safeguarding of essential Museum records and to define conditions of access.
* To extend computer services selectively and manage them efficiently, with trained personnel and budget control of both computer equipment and programming.
* To improve and expedite financial planning, budgeting, managing, and reporting systems so that they provide accurate and timely information.

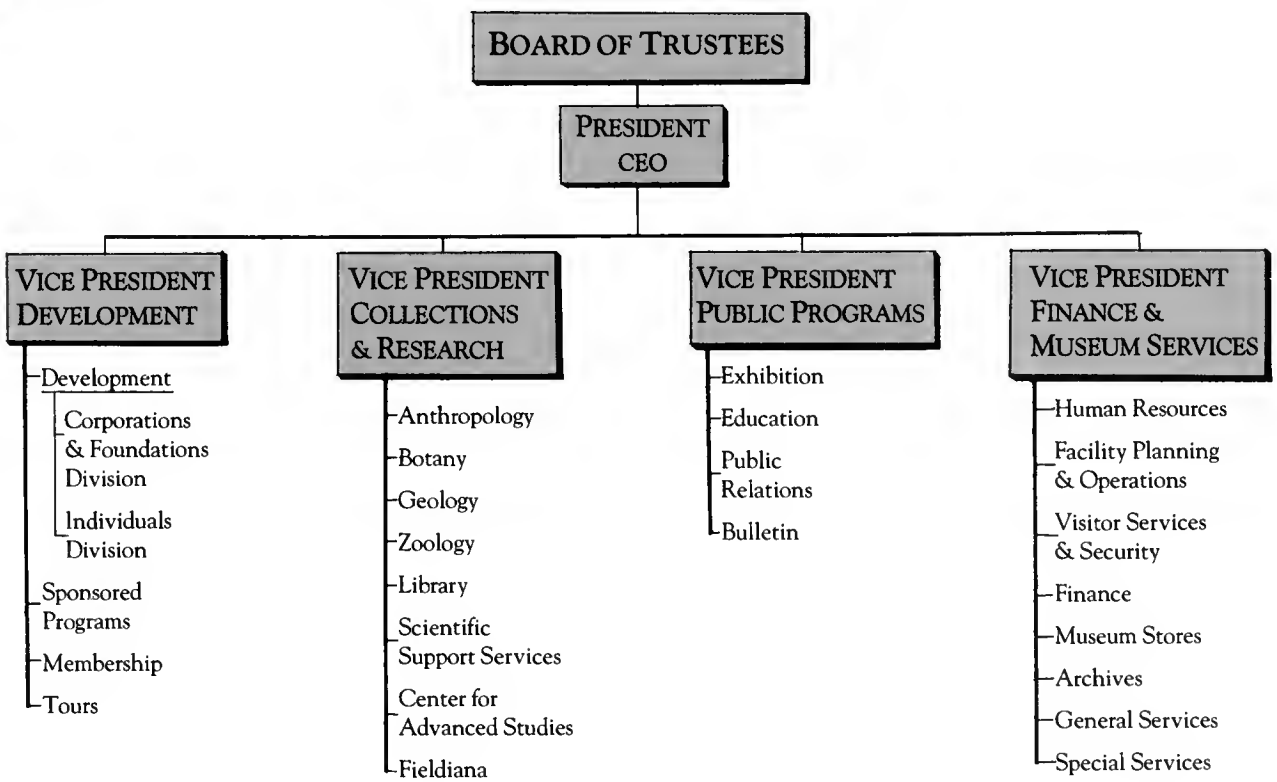
Fiscal Soundness

In comparison with other not-for-profit institutions, museums are fragilely financed—particularly the few natural history museums that maintain huge research collections and conduct active research. Most basic research in the United States is conducted in universities, health centers, and national laboratories and is financed through student tuition, patient fees, and major government grants and appropriations. Without students and patients, research museums cannot earn substantial income.

Moreover, because nongovernmental natural science research museums are committed to long-term basic research, they have not benefited from shorter term government research priorities. As a result, nongovernmental natural science research museums are not adequately funded. They have to rely more heavily on endowments and annual giving than do hospitals, universities, or national laboratories. To make major contributions to American science and increase public understanding of natural science, Field Museum must increase its income from existing sources and develop new resources.

Other trends deepen the fiscal challenge. Forty

Exhibit 10



Instructor Mary Ann Bloom with schoolchildren in the Pawnee Earth Lodge, Field Museum's full-size replica of an 1830s Indian dwelling. In 1985 more than 4,500 school groups visited the Museum to augment their studies. William Burlingham photo.

years ago the endowment accounted for 80 percent of our income; today it provides approximately 20 percent. And the costs of maintaining an excellent institution have risen. Thirty years ago computers and sophisticated equipment were not required for research, and exhibits were less complex. To meet this fiscal challenge, we must be imaginative in searching for income and in supporting appropriate programs. Even so, our resources will always be finite, and it will always be necessary to set expenditure priorities. As part of this effort, we must systematically project operating and capital budgets on a five-year basis.

To achieve fiscal soundness, Field Museum must maintain and increase its sources of support (Exhibit 9, page 22). Continued major support from the Chicago Park District is essential along with support from the State of Illinois. We must maintain the endowment's current percentage of our support through capital contributions and investment management, which will provide needed operating funds and long-term endowment growth.

Earned income must grow through increased attendance, expanded store and food sales, and enlarged special events activities. Also essential is imaginative and careful administration of the budget to permit maximum investment opportunities for current income.

In addition, to strengthen its financial stability Field Museum must form partnerships with comparable institutions so as to share staff and equipment and to reduce costs through pooling. In concert with peer institutions, Field Museum must make the case that natural science collections and research play a vital role in our nation in order to secure government and foundation support.

Notwithstanding the need to increase operating support from granting agencies, investments, and other earnings, Field Museum's future is dependent upon the private donor. We will continue to rely heavily on the private donor for annual support, and we will rely principally on the private donor for capital support.

To achieve the goals established for the future of Field Museum, the Board of Trustees has undertaken a three-year capital campaign to raise $40 million. This capital campaign is key to achieving the goals of our centennial planning process. The campaign has four crucial elements:

√ *Endowment:* to provide for collections and research and to maintain the current percentage of annual Museum support from endowment	$7,000,000
√ *Public exhibits and programs:* to provide new exhibits and programs in areas of the Museum that have not changed substantially in 60 years	$10,370,000
√ *Exterior and roof repair:* to repair the deteriorating exterior walls of the Museum and the leaking roof of the main hall	$12,630,000
√ *Operating support for 1984-1988:* to strengthen and carry forward the fundamental Museum programs	$10,000,000
Total	$40,000,000

The future of Field Museum depends on the success of this capital campaign. Every person concerned about this Museum must actively participate in this effort to secure its future.

Organizational Excellence

Field Museum is an institution with a lean staff and limited funds. The Museum has, nevertheless, committed itself to a very demanding mission: to be a national and international leader in research while serving the public directly as an exceptional natural history museum. In this era of limited funding, Field Museum cannot expect to fulfill its dual mission through financial resources alone. To reach its goals, the Museum must draw on its outstanding human resource—a staff and volunteer corps of extraordinary talent and dedication. The organizational challenge for the Museum will be to provide opportunities for these outstanding people to advance the Museum's mission.

The effort to meet this challenge will be fourfold:

1. *Unify the staff in support of the Museum's mission.* The Museum has recently adopted a new organization structure, with the objective of better focusing the organization on its basic missions (Exhibit 10, page 23). The departments that are most directly involved in the Museum's role as a research institution are grouped together into the area of Collections and Research. Public Programs staff are similarly grouped together. Finance/Museum Services and Development complete the new organization.

2. *Recognize explicitly the value of the Museum's staff.* People, not structures, make a great institution. And a great institution provides opportunities for people to achieve their professional goals. To that end, the Museum will endeavor to:
   - √ Provide training programs for staff development
   - √ Provide the staff with opportunities to express their ideas on Museum operations and to implement them whenever possible.
   - √ Provide clear information on employment opportunities and staff benefits.
   - √ Be an active equal opportunity employer

3. *Recognize the crucial role of the volunteer.* Field Museum's future depends on the gift of time by individuals. Collections are maintained, research carried on, programs conducted, funds raised, and the Museum governed by volunteers. Field Museum must strengthen its great tradition of volunteer leadership and responsibility. To that end the Museum will endeavor to:
   - √ Recruit additional volunteers from the Museum's diverse and expanding constituencies.
   - √ Provide orientation programs for respective volunteer responsibilities.
   - √ Provide volunteers with the opportunities to express their ideas on Museum operations and to implement them whenever possible.

4. *Look continuously beyond the Museum for ways to improve.* The role of the Museum and its staff and volunteers in conserving the past is well understood. Their ingenuity in doing so on limited budgets is legendary. We must build on that legacy to maintain a culture of innovation.

The Challenge We Face

Our challenge is to be the best natural history research institute and public museum. Best does not mean biggest. Best does require the most of each of us.

To accomplish much, we must be prepared to do much. *We* are the Field Museum. Its successes are our successes. Its failures are our failures. Continued vision and perseverance will be required of us if we are to lead among the world's great centers of natural history in 1993 and beyond. ■

FIELD MUSEUM TOURS

Dear Field Museum Member,

Have you ever considered a Field Museum tour?

I'd like to tell you about our tours—from "Bon Voyage!" to "Welcome Home!" We feel our tours are exceptional because each has one of the Museum's curators as a tour leader, and this individual takes an active part in tour preparation.

There are many things to see and do before you're really on your way. Before any tour departs, we plan an Orientation Meeting for all the tour participants. This gives everyone the opportunity to meet the curator who will lead the tour, and also to hear an informative lecture, illustrated with slides. It also gives the travellers a chance to ask questions pertaining to the natural and/or social history of the tour. We go over the itinerary, and I am always there to answer questions about logistics.

In March/April of this year we featured a New Zealand tour, which coincided with the Museum's "Te Maori" exhibition. The exhibit provided an informative lecture series, as well as the opportunity to view outstanding artifacts—an exciting introduction to the New Zealand trip!

If you see an announced tour which particularly appeals to you, just send an advance deposit of $50 per person to the Field Museum's Tours office, to ensure your place. You will be notified about all upcoming activities related to the tour, and the deposit is completely refundable should you change your mind prior to the first installment payment.

Advanced planning assures a successful and memorable trip. Passports, visas, inoculations, insurance and currency rates must be taken into consideration. What's the mean temperature and average rainfall? The age-old questions of what to pack and who else is going? Is there a detailed itinerary, and can you find a reading list to find out what you'd really like to see? How can you be reached during an emergency? Window or aisle? All these arrangements are completed for you by our office.

When you travel with Field Museum, you travel with a purpose. Your Tour Leader is a constant source of information about the country's flora, fauna, and cultural heritage. Someone is always there to regulate or adjust transportation, lodging, and meals.

Tours projected for 1987 include Peru, China, the Galapagos, Hawaii, Canada's Queen Charlotte Islands, New Zealand, and—aboard the *Sea Cloud*—the western Caribbean, Tikal, and the Yucatan.

For reservations, call or write Dorothy Roder (322-8862), Tours Manager, Field Museum, Roosevelt Rd. at Lake Shore Dr., Chicago, Il 60605

Hermann Bowersox

Stanton Cook, courtesy The *Chicago Tribune*

And when the tour is completed, it's still not really over, because we keep in touch. We also arrange for a reunion party, to relive the experience and share photographs and stories. Besides, we find that our tour participants' suggestions and comments are extremely helpful, and ensure that we continue to plan tours which reflect what you want to see and experience.

Please look over the list opposite, which presents some of the 1987 tours now under consideration. If you'd like more information, please contact me. One of the nicest things about my position at Field Museum is the joy of sharing your expectations for a never-to-be forgotten trip, so I'd love to hear from you.

Sincerely yours,

Dorothy S. Roder

Dorothy S. Roder

Field Museum of Natural History
Membership Department
Roosevelt Road at Lake Shore Drive
Chicago, IL 60605-2499

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CHICAGO IL 60626

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MUSEUM OF NATURAL HISTORY BULLETIN

November 1986

American Indian Celebration
28 & 29

Field Museum of Natural History Bulletin

Published by
Field Museum of Natural History
Founded 1893

President: Willard L. Boyd

Editor/Designer: David M. Walsten
Production Liaison: Pamela Stearns
Staff Photographer: Ron Testa

The Women's Board of Field Museum Presents The Treasures Ball

The Treasures Ball, a gala black tie dinner dance, will be held Friday, November 7, in Field Museum's Stanley Field Hall. Reception and exhibit at 6:30, dinner at 8:00. The evening will feature a special exhibition of rare objects from the Field Museum archives, selected by the Museum's curators. Mrs. Robert C. Ferris is chairman of the gala. Vice-chairman are Mrs. Donald C. Greaves and Mrs. John L. Hines. Mrs. Malcolm N. Smith is president of the Women's Board. Music for the party will be provided by the Bob Hardwick Orchestra.

The Treasures Ball is being underwritten by Sara Lee Corporation.

For further information, please call Margaret Ann Ratcliffe, Women's Board coordinator, at 322-8870.

CONTENTS

November 1986
Volume 57, Number 10

COVER

Barbara L. Clauson, field associate for the Division of Mammals and the Division of Birds, carries her share of the load during a recent expedition to Costa Rica. For more on the expedition see pages 11-18. Photo by Robert M. Timm.

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ISSN 0015-0703

A special invitation for Museum Members to

A FAMILY CHRISTMAS TEA AT FIELD MUSEUM

Thursday, December 11

1:00 - 3:00 p.m.
Stanley Field Hall

THE POTTERY, basketry, textiles, dance, and music of the American Indians embodies the heritage and values of these ancient cultures. The techniques for creating these arts, which have been handed down from generation to generation for hundreds of years, continue to be taught by the elders to the younger members of the tribes.

Join us in November as we celebrate this legacy of Chicago area Native Americans. Meet and talk with craftspeople as they demonstrate their fine artistic skills on Saturday, November 22, from 1:00 to 3:00pm. Experience the pageantry, rhythm, and athletic agility of tribal and fancy dancers and musicians during performances at 1:00pm and 3:00pm, on Friday and Saturday, November 28 and 29.

World Music Program

Saturdays and Sundays in November
1:00 and 3:00pm

MUSIC COMMUNICATES MANY DIFFERENT THINGS to many different people. It is something that can be shared by all of us, whether or not we have common lifestyles, beliefs, or even languages. From the rhythmic sounds of the talking drum to the melodic strains of a Native American flute, experience with us the music of Africa and Native American cultures.

The World Music Program is supported by Kenneth and Harle Montgomery in honor of E. Leland Webber, president emeritus of Field Museum.

CONTINUED →

Events

November and December Weekend Programs

EACH SATURDAY AND SUNDAY you are invited to explore the world of natural history at Field Museum. Free tours, demonstrations, and films related to ongoing exhibits at the museum are designed for families and adults. Listed below are just two of the numerous activities each weekend. Check the *Weekend Programs* sheet upon arrival for the complete schedule and program locations. The programs are partially supported by a grant from the Illinois Arts Council.

Saturday, November 1, 11:00am *Ancient Egypt* (tour). Explore the traditions of ancient Egypt from everyday life to myths and mummies.

Saturday, December 6, 1:30 pm: *Tibet Today* (slide lecture). See Lhasa and other towns recently opened to the public.

These programs are free with Museum admission and no tickets are required.

Family Feature

Hand Puppets!
December 13 and 14
1:00-3:00pm

YOU'VE MADE HAND AND FINGER SHADOWS of animals on the wall, now go one step further. Hands can easily look like octopuses but, with a little makeup, you can have an elephant, giraffe, or even a frog at the end of each arm. What incredible animals can you create? Come to Field Museum and try your hand at it!

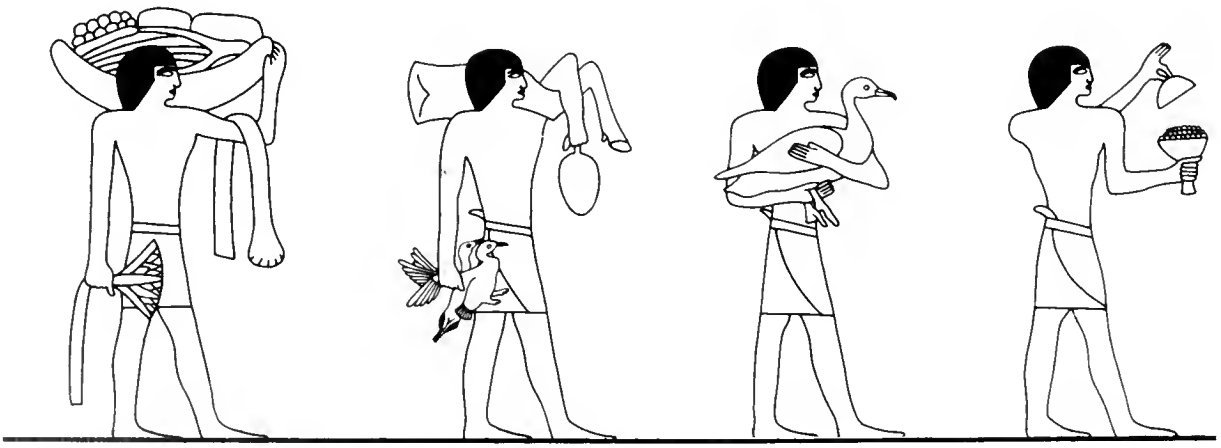
Family Features are free with Museum admission and tickets are not required.

Peter and the Wolf

Bob Kramer's Marionettes
Monday and Tuesday
December 29 and 30, 2:00pm
Stanley Field Hall

AN EVIL WOLF, a sly cat, a clever bird, and a very brave little boy are the stars of Prokofiev's famous symphonic fairy tale *Peter and the Wolf.* Bob Kramer's Marionettes bring a new life to this story and melody, known so well by children everywhere. Let this spectacular of music and marionettes be the finale to your family's holiday season—a treat to you from Field Museum.

This program is free with Museum admission and no tickets are required.



Books

THE NEMESIS AFFAIR:
A Story of the Death of Dinosaurs and the Ways of Science
by David M. Raup
W. W. Norton & Co., 212 pages, $14.95
Reviewed by David L. Hull

PROFESSIONS KEEP THEMSELVES WELL INSULATED from outsiders by several layers of hypocrisy. Those on the inside know how the profession actually functions but keep this knowledge to themselves either because they are too shy to speak up or because they fear the effect that such revelations might have on their profession. I suspect that most professionals are wise to participate in this conspiracy of silence. If the general public discovered what really was going on, there would be hell to pay.

David Raup thinks that science is an exception. Yes, scientists are as hypocritical about science as doctors are about the medical profession or professors are about teaching, but Raup thinks that they need not be. He seems confident that outsiders will value science just as much once they know how it actually operates as they did when they believed the Just-So Stories that are usually told about it, possibly more so. He presents science as being composed of very human beings who are fascinated by the world in which they live, who get great joy from being right and not infrequently perverse pleasure in showing others to be wrong, who speculate wildly and doggedly insist that sooner or later evidence must be brought to bear on their speculations. But most of all, this book is written to say a few good words for the mavericks of science, those frequently maligned scientists who challenge conventional wisdom and who are so difficult to tell from the lunatic fringe.

Raup's particular subject matter is a series of related hypotheses that gained the attention of scientists in various fields starting in 1980 about the mass extinctions which punctuate the fossil record. In the beginning Raup shared the conventional wisdom—the causes for groups of organisms going extinct are extremely varied and haphazard, changes in the environment, competition from other species, the evolution of new viruses, etc.—the sorts of causes that we see operating around us all the time. Following the great 19th-century geologist, Charles Lyell, geologists, paleontologists, and evolutionary biologists prefer to explain phenomena initially in terms of familiar causes acting at current rates. Only when these causes are exhausted is a scientist justified in postulating more drastic, though equally naturalistic causes.

Scientists are addicted to regularities, cycles and the like. Planets do revolve around stars in ellipses, organisms do go through life cycles, there are circadian rhythms, but so many of the cycles which scientists have postulated have turned out to be illusory that in certain areas of science, periodicity is highly suspect. As regular as rain some historian or other will suggest that societies go through life cycles or a biologist that species rise and fall as regularly as the Roman Empire or the Third Reich. In the case of biological evolution, these suggestions about cycles and periods are even more questionable because the causes which biologists acknowledge are so irregular and haphazard.

Mass extinctions have always proved an embarrassment to evolutionary biologists. If they are as abrupt and massive as they appear, then how can the sorts of causes acting today at current rates explain them? Conventional wisdom is that they are not as abrupt as they appear. The spotty, haphazard nature of the fossil record makes them look so drastic. Rates of extinction vary, but the same sorts of influences are responsible for extinction during slow as well as more active periods. The period of rapid extinction which had the most dramatic effect occurred at the boundary between the Permian and Triassic Periods, about 250 million years ago, when up to 96 percent of the species existing at the time went extinct.

David L. Hull is Professor of Philosophy at Northwestern University.

Less drastic though even more interesting, was the period of rapid change that occurred more recently at the boundary between the Cretaceous and Tertiary Periods, about 65 million years ago, the time at which the dinosaurs at last went extinct. This "mass extinction" is fascinating because we find dinosaurs fascinating, but as far as numbers are concerned, dinosaurs played only a minor role. Incidentally, the "mass extinctions" always seem to come at the boundaries between geological periods, but that is simply because this is the way that these periods were distinguished in the first place.

Thus, when a high-energy physicist and Nobel laureate, Luis Alvarez, his son Walter, a geologist, and two chemists, Frank Asaro and Helen Michel, published a paper in *Science* in the spring of 1980 suggesting that the extinction of the dinosaurs and other species was actually caused by the impact of some sort of an extraterrestrial body such as a large meteor, those scientists most directly concerned with explaining extinctions were aghast.

Collisions with meteors are certainly not miraculous events, but any collision that could kill off so many kinds of organisms over a very short period of time certainly counts as a catastrophe. If the issue had been simply whether or not a large meteor had hit the earth 65 million years ago, it would have roused little attention. Meteors hit the earth all the time. But the implications were startling. If Alvarez and company were right, then everyone else was wrong. The most important feature of this paper and the only one that justified its publication in such a prestigious journal as *Science* was that the authors presented independent evidence that a huge meteor had actually hit the earth at the time necessary to produce this mass extinction — an unusually high concentration of iridium, an element that is normally absent from the earth's crust but relatively common in some types of meteorites. But if meteor impacts caused one mass extinction, why not others? In the next few years, numerous papers were published arguing the existence and relevance of iridium deposits at important boundaries in the fossil record.

What was Raup doing during all of this time? For one thing, he had served as one of the referees for the paper by Alvarez and company. He found the paper poorly written and somewhat pretentious in style. Besides, several years before, he himself had investigated the possibility of collisions with extraterrestrial bodies causing mass extinctions and, by means of computer simulations, had found the cause not up to the effects. He concluded that the manuscript was potentially excellent and exciting, meriting rapid publication, but actually mediocre and should not be published. "If a

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graduate student gave me this manuscript to read, I would see it as a brilliant piece of work (indicating that the student has enormous potential) but I would give it back to be done right!" The editors of *Science* followed Raup's advice and returned the manuscript to the Nobel laureate and his co-authors with the suggestion that they rework their manuscript, this time "doing it right."

In 1977 Alfred G. Fischer and Michael A. Arthur published a paper in which they claimed that major extinctions come every 32 million years. Raup's reaction at the time was the same as everyone else's—incredulity. The data was messy, and the authors were very vague about the mechanism that could produce such regular extinctions. However, in 1982, a young colleague of Raup's at the University of Chicago, Jack Sepkoski, published a huge compendium of the origin and extinction of fossil groups. The following year, Raup and Sepkoski began playing with this data to see if they could discern any regularities. Eventually one materialized—periodic mass extinctions every 26 million years. Raup and Sepkoski were very leery. They did not want their names added to the list of gullible scientists and pseudoscientists who had suggested cycles in the fossil record. The implications of their hypothesis were even more fundamental than those of the meteor impact hypothesis. It is one thing to say that a particular mass extinction really was massive and caused by a meteor. The suggestion that many, possibly all mass extinctions were caused by collision with extraterrestrial objects was even more ambitious. But to add to these hypotheses the claim that the collision and subsequent extinctions occur at regular intervals involves a speculative quantum leap. What in heaven's name could cause such regular extinctions?

When Raup and Sepkoski, after considerable effort, were unable to shoot down their hypothesis, they published. Initially the reaction was mixed. Astrophysicists suggested celestial mechanisms to explain the periodicity of extinction, including a small companion star to the sun which they named "Nemesis," the Death Star. Raup himself suggested periodic reversals of the earth's magnetic poles. In support of Raup and Sepkoski, Walter Alvarez and Rich Muller reported a periodicity of crater formation every 32 million years. The extinction and crater cycles even coincided—sort of. But the responses of many of their colleagues were anything but favorable, culminating in an editorial in April of 1985 in the *New York Times*, concluding that astronomers "should leave to astrologers the task of seeking the cause of earthly events in the stars."

When Raup started writing up the chronicle of the Nemesis affair, he hoped that some resolution would have been reached by the time he was ready to publish. Fortunately for the reader, the controversy continues unabated, even though several editors of journals and science journalists have declared it over. Usually histories of science are written long after the smoke has cleared and we know who is right. As a result, not only is the smoke left out, the power of hindsight is brought to bear on the arguments and evidence. Those scientists who turn out to be right are lauded as "keen observers" and "responsible scientists," while those who opposed them are condemned as being "blinded by preconceived ideas."

Those scientists who turn out to be wrong are dismissed as "idle speculators" and those who opposed them praised as properly "sober scientists." The real world is not like this at all. When scientists must opt on scientific ideas, the data is always messy and indeterminate. The winds keep blowing. First one side seems to be winning, then the other. One of Raup's goals is to avoid the "sanitized" view of science which characterizes so much of the literature on science. The fact that he does not know who is eventually going to win helps in this respect. We do not know yet who the heroes and villains are. Nor is he in the least tempted to debunk science. There is much more to winning in science than public relations and professional advancement. Data does matter — eventually, to some extent, when all else fails.

Raup sees as one of the challenges for future paleontologists in studying extinction is to "do a much more thorough job of identifying the winners and losers, so that we have a better chance of learning exactly what environmental stresses were responsible for the disaster." Those of us who study science might well set ourselves a parallel task with respect to scientists and their theories. Who are the winners and the losers, and how were these contests decided? Why was a whole succession of papers by serious, well-placed scientists urging drastic causes for catastrophic effects in the history of life ignored until the paper by Alverez and company? Why was the paper on the periodicity of extinction by Fischer and Arthur dismissed so lightly?

Raup does not know the answers to these and other questions. As in the case of his 26-million-year cycles of extinction, he has discerned a pattern. Now we need the mechanism. Raup has written an immensely enjoyable book. The only thing more fascinating than dinosaurs munching their Mesozoic vegetation or being terrorized by *Tyrannosaurus rex* is scientists engaged in battles over their favorite scientific hypotheses.

The New Income Tax Law and Charitable Giving

by Clifford Buzard
Planned Giving Officer

Fund-raising efforts of most not-for-profit institutions like Field Museum will neither rise nor fall as a result of any new income tax law.

So states Thomas R. Sanders, vice president for Development at Field Museum. "People give to their favorite charities because they want to give," Mr. Sanders said. "For many of our donors, tax benefits from their giving have been 'icing on the cake,' because they are motivated by more positive factors. They give because they get tremendous self-satisfaction out of giving. They give because they understand and appreciate the important educational programs and scientific research projects to which the Museum and its staff (including 45 PhDs, of whom 32 are curators) are committed."

The Senate and House of Representatives Joint Conference Committee on tax reform made what observers call a "miraculous" compromise between earlier passed Senate and House bills on tax reform. The two bodies approved the compromise on their return to session in late September. President Reagan later signed the bill.

The Tax Reform Act of 1986 makes major changes that not only will affect the nation's businesses, but also will affect individuals—changes that increase the personal exemption, reduce the rates and number of rates, and eliminate or limit deductible items.

Changes in the rules concerning charitable giving and related deductions are relatively few. Just how gift receipts in the independent sector (the not-for-profit world) will be affected and to what extent remains to be seen; as yet there is no consensus among nonprofit leaders. As drafted at this writing, the new law affects charitable giving and the charitable deduction in three ways:

First: The deduction is eliminated for charitable gifts from those persons who use the short form 1040 (non-itemizers), effective January 1, 1987.

It is expected that non-itemizers who give to the Museum will continue their giving, because they will be either in the lower bracket or off the tax rolls. For 1986, the graduated deduction for charitable gifts by non-itemizers rose to 100 percent, or the total amount of the gift. And the same rule as for other taxpayers applies: a person may give up to 50 percent of adjusted gross income to charity if giving cash, or up to 30 percent of adjusted gross income if giving appreciated securities.

Second: For the most part, rules for recognizing capital gains and capital gains tax on gifts of appreciated property stay the same, except for one important limitation: Under current law, a person may deduct the total market value of a gift of appreciated property, such as stocks, and recognize no capital gain or capital gains tax. Under the Tax Reform Act of 1986, tax on a portion of the capital gain reflected in a gift of appreciated property will be assessed, but assessed only on those persons who are subject to the alternative minimum tax.

Third: Congress always has encouraged charitable giving and, through the charitable deduction, in effect, subsidizes the gift. For example, under the current maximum tax rate of 50 percent, a $100 gift reflects a "subsidy" by the government of $50. Under the two-year graduated maximum rate, 38.5 percent in 1987 and 28 percent in 1988, a $100 gift would reflect a "subsidy" of $38.50 in 1987, $28 in 1988 and thereon, assuming no further rate changes.

"The effect on charitable and not-for-profit institutions, such as Field Museum, should be minimal," Mr. Sanders said, "because so many non-itemizers will either drop to the 15 percent minimum tax rate or even pay no taxes, that they will have more discretionary income and will continue their giving beliefs and practices," he explained.

"Not all those who give appreciated stock will be affected by the capital gains tax. Those donors will continue to give appreciated stock, and as much as before; those donors subject to the alternative minimum tax will probably still give stock, if they are properly motivated to continue their charitable interests.

"At Field Museum, donors come from the membership rolls, and those members give over-and-above membership dues. As our membership grows, we will have an opportunity to increase our number of donors," Mr. Sanders continued.

Mr. Sanders pointed to *Giving USA*, 1986, published annually by the American Association of Fund-Raising Counsel. In that report, Robert L. Thompson, chairman, said: "In the 50-year history of the. . . Counsel

we have learned from first-hand experience that the tradition of voluntary giving is firmly implanted in the people of this country and that it is one of the remarkable characteristics that set this country apart from every other country in the world. We are also consistently improving the record, as evidenced by the fact that philanthropic giving in 1985 was double what it was just seven years ago."

Just as Congress has not changed any of the inheritance or estate tax laws that were part of the 1981 tax overhaul, so, too, there are continuing benefits in "deferred," or "planned," gifts. These include gifts of life insurance, real estate, and gifts that return an income to the donor (life income trusts). Some methods of Planned Giving are reviewed, following:

Life Income Trusts

Giving gifts that return a life income to the donor take the form of trusts. Upon the death of the donor, or last surviving beneficiary, the principal that made up the trust is transferred to the Museum. All gifts of this "deferred" nature are deposited into the Museum's general endowment.

Charitable life income trusts basically are of three types: the Charitable Remainder Unitrust, the Charitable Remainder Annuity Trust, and the Field Museum Pooled Income fund.

These are attractive to a person who has a significant amount of highly appreciated securities. They are often of low yield, yet, the donor retains them simply because the capital gains tax would make it almost prohibitive to sell. In addition, the person probably wants the income.

Complete freedom from capital gains and, therefore, capital gains tax, coupled with usually higher yields, make life income trusts attractive. The new tax law continues to allow this "waiver" of recognition of capital gains, even for those persons who must pay the alternative minimum tax. This fact, too, makes life income trusts attractive.

The two major types of charitable remainder trusts are the Charitable Remainder Annuity Trust and the Charitable Remainder Unitrust. An annuity trust pays the donor/beneficiary a fixed dollar amount quarterly; the unitrust pays out quarterly a fixed percentage of the fair market value of the trust, based on an annual evaluation. By law, neither trust can pay out less than 5 percent. The annuity trust is a fixed instrument, in that principal cannot be added to it; the donor may add to the principal of a unitrust at anytime.

The Field Museum Pooled Income Fund pays to the donor/beneficiary only the income of his share of the fund. A person may participate with a minimum of $10,000, and he may add to it in $1,000 increments at any time. At the time of entering into the fund, the value of the donor's transfer is translated into numbers of "units" in the fund. Payments are made on a pro-rata basis of the number of "units" in the fund in which the donor has an interest. The Field Museum Pooled Income Fund pays out monthly.

In all such life income trusts, at the death of the donor/beneficiary, what is left in the trust—the "remainder"—reverts to the Museum and its endowment fund. On the death of the donor/beneficiary in the Pooled Income Fund, only the underlying principal representing that donor's income interest reverts to the Museum; the Pooled Income Fund continues to provide income for the surviving participants in the Fund.

Gift of Real Estate

Still an attractive form of gift unaffected by the new income tax law is a gift of real estate. A home, condominium, farm, a building, a summer cottage—all are ideal gift vehicles.

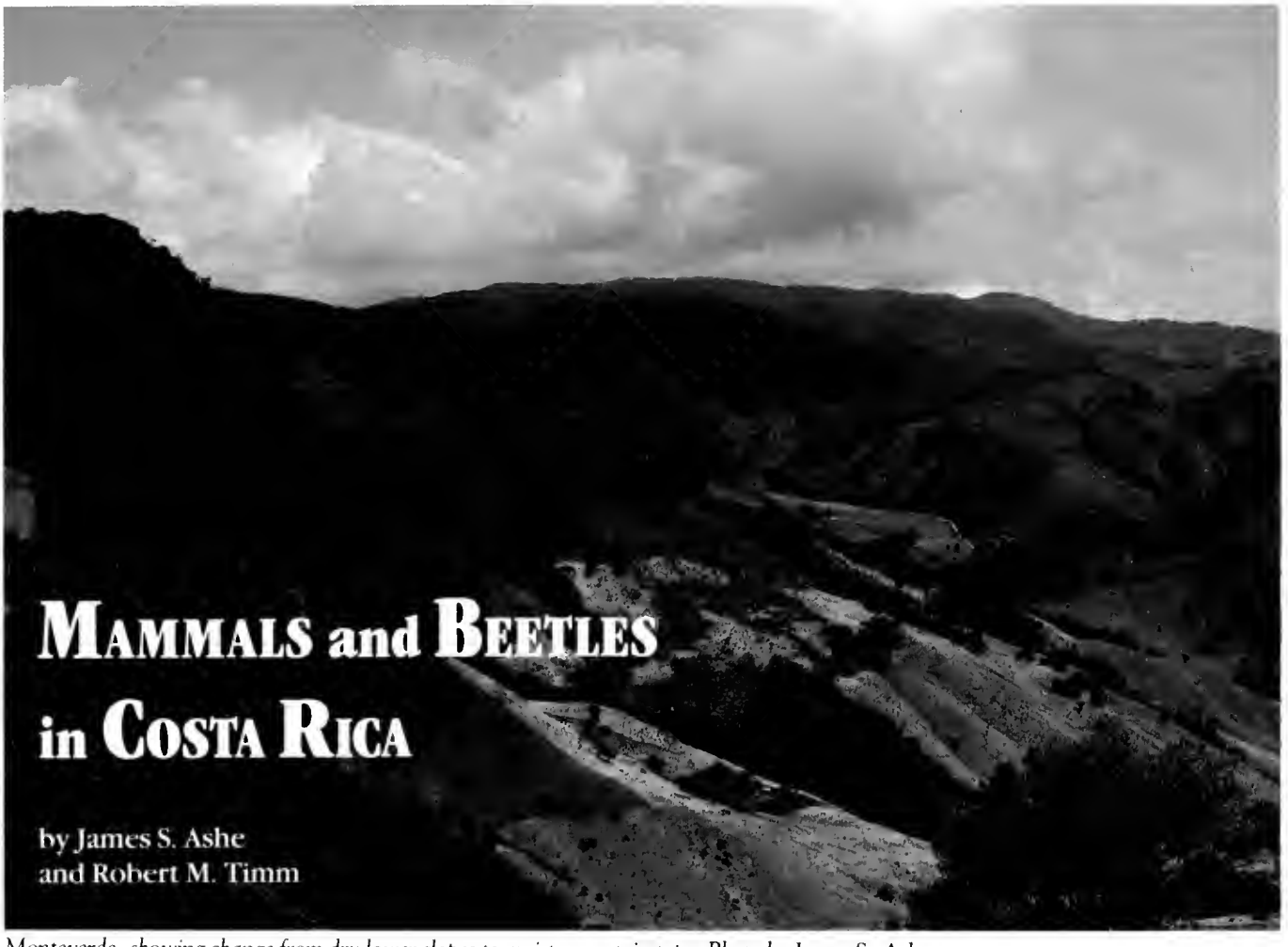
If making an outright gift of real property, and that property has appreciated in value, the donor does not recognize any capital gains and, therefore, is not subject to capital gains tax.

An arrangement known as a "life estate agreement" can be made whereby the donor gives the property, but remains living there rent-free for life, maintains it and pays taxes, and enjoys any income it provides. In such an agreement, the donor does recognize a portion of the capital gain in the property to which he may be subject to capital gains tax.

Gifts of Life Insurance

While life insurance policies do not have to go through the probate process, they are counted in a decedent's gross estate for federal estate tax purposes. For this reason, some persons find it advantageous to give the Museum life insurance policies. Each donor, in giving gifts other than cash or securities, should seek advice from his attorney or accountant.

While Field Museum is endeavoring to increase its endowment through "deferred" gifts such as life income trusts and bequests, the Museum annually must raise from $2-$3 million in contributions to the operating fund to avoid deficits. Any gift, therefore, of any size, is always gratefully appreciated. **FM**



MAMMALS and BEETLES in COSTA RICA

by James S. Ashe
and Robert M. Timm

Monteverde, showing change from dry lower slopes to moist mountain tops. Photo by James S. Ashe.

FIELD MUSEUM OF NATURAL HISTORY has a rich history of leadership in the study of the remarkable and rapidly disappearing fauna and flora of the tropical Americas. In support of this overall program, the Rice Foundation of Chicago made available funds for current research on tropical mammals and their parasitic associates. These funds were used to support an expedition to Costa Rica in March, April, and May of 1986.

The expedition had two main thrusts. The first was in response to an invitation from the Costa Rican National Park Service to participate in a survey of the mammals and their parasites of a new national park being established. The results of this survey will provide the basis for a wildlife management plan for the park. In the second phase of the expedition we studied in detail the nature of the interaction between a unique group of rove beetles (Staphylinidae), which were thought to be parasitic on neotropical mammals, and their mammalian hosts. The goal was to better understand the ecology, evolution, and resource use patterns of parasite-host relationships.

The following letter from curators Ashe and Timm was written during the expedition from one of the field sites to Mr. and Mrs. Arthur Nolan of the Rice Foundation.

1 May 1986
Dear Mr. and Mrs. Nolan,

Just a short letter from Costa Rica to let you know that our expedition has been superbly successful to date.

We are currently at Monteverde, a picturesque farming community in the Tilarán Mountains of northwestern Costa Rica. Today we are experiencing one of

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Bob Timm (right) and assistants load pack horse for trip to the base camp. Photo by James S. Ashe.

those few remarkably beautiful days that occur briefly between the period of cold blowing mists that come from the east, and the heavy rains that come from the west. We are indeed fortunate to be working here at this time because our final study site in this area is a one-and-a-half-hour walk up a very steep trail to the top of the highest mountain in all of northern Costa Rica, Cerro Amigos. Working at this site in the rain or mist would be virtually impossible.

The first leg of our expedition involved a survey of the mammalian fauna along an elevational transect in a newly expanded national park in northeastern Costa Rica, the Zona Protectora, at the invitation of the National Park Service. This five-week survey involved studies in magnificent, but rugged, virgin rain and cloud forest from near sea level to the crest of Volcano Barba, which rises to over 2,800 meters (about 9,500 feet). The region represents one of the most remote and unexplored tracts of wilderness in all of Costa Rica. Access to the area is very difficult. We were able to take a 4-wheel drive vehicle across old abandoned logging roads to a trail head. There we transferred our gear to short, but ruggedly built, pack horses for the long, physically demanding, slog to the initial base camp. Once there, however, all travel within the area, from the lowest to

The barn which provided laboratory space at Monteverde. Photo by James S. Ashe.

Deep within the Monteverde Cloud Forest Reserve. Photo by James S. Ashe.

Monteverde cloud forest mouse, Peromyscus nudipes. *Costa Rica is host to some 200 land mammal species. Photo by James S. Ashe.*

*Mating golden toads (*Bufo periglenes*) in Monteverde. This species is known to occur only within one square kilometer of this region—nowhere else in the world. About 180 amphibian species are known to occur in Costa Rica—a country the size of West Virginia. Photo by James S. Ashe.*

the highest elevations, was by foot along steep, muddy and very primitive trails under heavy packs. Throughout this part of the expedition we lived out of tents and washed clothes, bathed, and drank out of sparkling cold mountain streams amid spectacular and diverse tropical forests. Though it rained virtually every afternoon, the nights were often crystal clear, and we had a magnificent view of Halley's comet. It was clearly visible among the stars of the Southern Cross, which sparkled with the clarity that can only be found in those last few areas far from the lights and pollution of civilization.

This newly established national park represents one of the last strongholds of jaguars, mountain lions, peccaries, and tapirs in all of the northern half of Costa Rica. Our studies here were extremely productive, and our results will form the basis of the wildlife management plan for this new national park.

From the survey it was back to San José, the capital of Costa Rica, for a much needed hot shower and restocking of supplies.

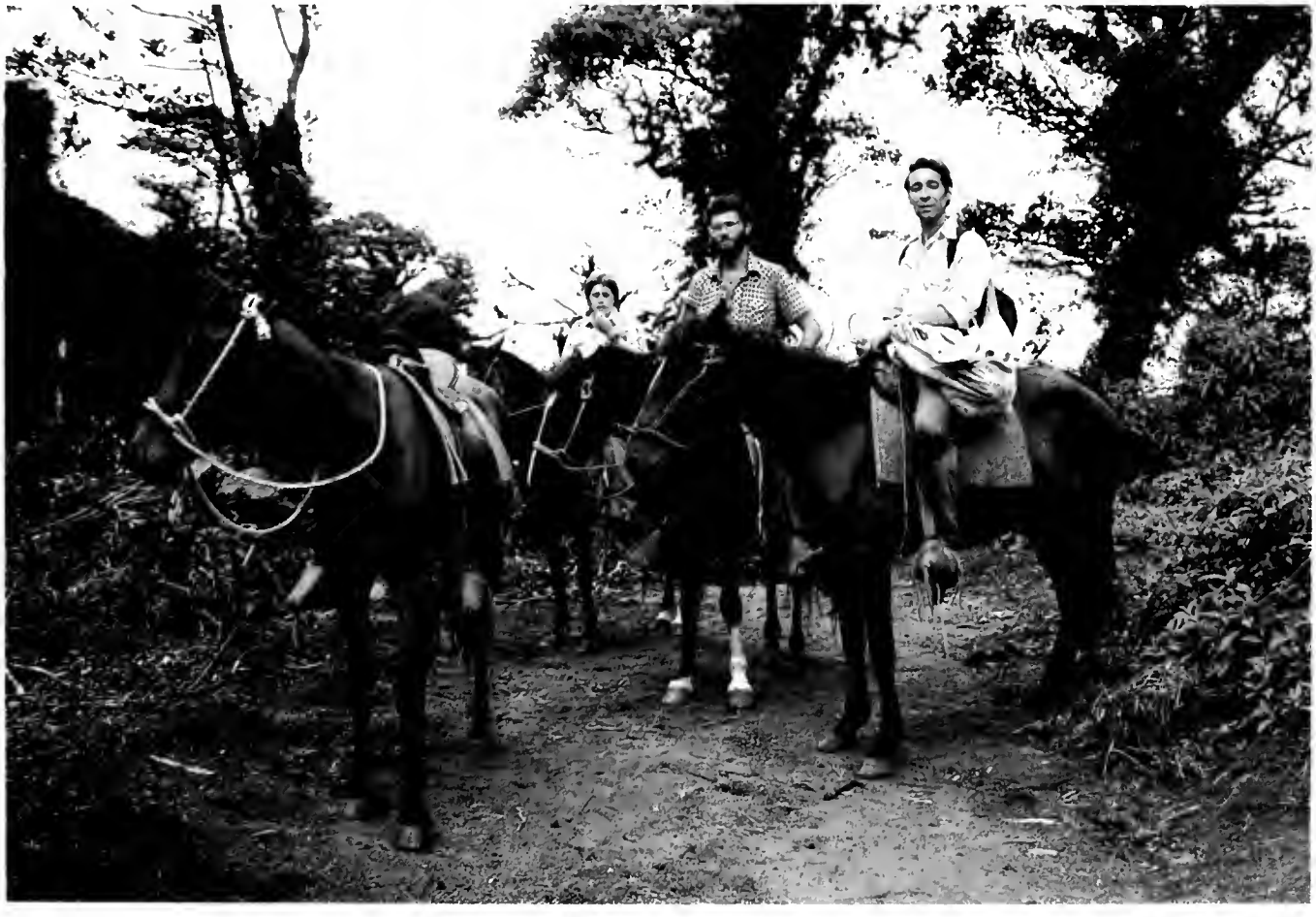
The second phase of the expedition, which we are about to conclude, is here at Monteverde. Monteverde is a community founded by Quakers who were escaping the war draft in the United States in the early 1950s. They selected one of the most remote mountain regions

of northwestern Costa Rica to establish a small, agriculturally based community. It represents an interesting mixture of cultures, combining modern dairy practices with isolated life-styles and values. The Monteverde community is famous among naturalists and tropical biologists because it forms the point of access to one of the largest expanses of virgin montane cloud forest remaining in all of Central America. For our purposes, Monteverde is an ideal place to conduct our studies because of the several major habitat and forest types found in close proximity to the community. We are staying at a local inn (here called a *pension*) and have our laboratory set up in the loft of a dilapidated, leaky barn which we are renting from a Monteverde resident.

Because of the large expanse of nearby virgin cloud forest, progressive land and forest management, and strong conservation ethic in the community, wildlife in the area is abundant. While on our study sites we frequently observe a wide variety of wildlife including peccaries, foxes, howler monkeys, agoutis, resplendent quetzals, and a tremendous variety of other rare and beautiful tropical birds, many of which are virtually extinct elsewhere. The howler monkeys are especially exciting to observe at close range because of their ag-

Bob Timm processing specimens in the makeshift lab at Monteverde. Hanging at left are Berlese funnels, used for separating insect specimens from debris, such as forest litter. Photo by Barbara L. Clauson.

Curators Timm (center) and Ashe (right) about to ride up to their research site. At left is Margaret LaVal, Monteverde resident who provided the mounts. Photo by Barbara L. Clauson.



Steve Ashe (left) and Bob Timm ready for the day's collecting. Photo by Barbara L. Clauson.

gressive and vocal displays which are directed toward intruders—*us!*

Our studies in the Monteverde area are designed to elucidate the poorly understood and complex relationships between a group of staphylinid beetles thought to be parasitic on cloud forest rodents, their host, and the effect of elevation, forest type, and moisture gradients on distribution, abundance, and host relationships. The results, to date, have greatly exceeded our expectations and certainly represent the finest and most complete data set that has ever been collected about these interactions. We are anxiously looking forward to analyzing our results upon our return to Chicago.

In a few days we will return to San José to prepare for the last phase of our studies. This will involve travel to the region of the highest mountain in Costa Rica, Cerro de la Muerte, whose peak rises to over 10,000 feet. Here we will study a much more complex association of rodents and their beetle parasites, at elevations which are not available in the Monteverde area. The name *Cerro de la Muerte* literally means "the mountain of death," and originates from the early days when coffee, the main export crop of Costa Rica, was carried by oxcart over a nearby mountain pass, during which time many of the people who transported the coffee beans died from cold and exposure. The primary coffee-producing region is the Central Valley around San José. To get the crop to the main port along the Pacific coast, Puntarenas, oxcarts were used to haul the beans over the rough roads and rugged mountain passes. We expect cold, wet conditions; but, with our modern equipment, we anticipate no serious problems while working at this elevation.

This will complete our studies on this expedition to Costa Rica, and, after more than two months of fieldwork, we look forward to returning to Chicago. We would like to thank you again for your interest and support which has made it possible for us to undertake this exciting and very productive expedition.

All of us are healthy, in great physical condition from all the fresh air and exercise, and delighted with how well our research is going.

We send you our best wishes and regards, and look forward to sharing our adventures and experiences with you in more detail when we return to Chicago.

Sincerely yours,

Steve Ashe
Bob Timm

Tropical New World bats, all collected during the expedition. Left, above, Artibeus lituratus, *a fruit-eater; upper right,* Phyllostomus hastatus, *a predator which eats insects, lizards, and other small animals; lower right,* Trachops cirrhosus, *whose diet preference is frogs. The wartlike bumps around* Trachops' *mouth may be sensors for determining a frog's edibility. Photos by Barbara L. Clauson.*

Postscript

Several weeks have passed now since the 1986 Costa Rican Expedition returned back to Chicago, and it is appropriate to ask what was gained, what was learned, what were the products of this expedition?

Investigation of the immense diversity and evolution in tropical ecosystems represents one of the great frontiers of biological science. Yet, the immediacy of the task is made more urgent by the rapid destruction and alteration of those very tropical ecosystems which require so much study. Among Central American countries, Costa Rica has done a remarkable job of establish-

Day's end at Monteverde. Photo by James S. Ashe.

ing national parks and wildlife reserves, with fully 10 percent of its land presently under some protected status. Nonetheless, the Ministry of Agriculture recently estimated that at least 75 species of animals are threatened with extinction in the country.

Field Museum expeditions not only provide collections, specimens, and data which document and allow future study of this diversity, but also provide scientific knowledge in two very important areas. Expeditions allow us to study, in detail, biological relationships and patterns of evolution which are unique to the tropics. Secondly, study of tropical ecosystems provides data and understanding of the relationship of natural areas to the preservation and management of a country's resource heritage of tropical plant and wildlife.

While the wealth of data gathered is still being analyzed, preliminary results of this expedition illustrate both points. Work in the Zona Protectora will provide the basis of a wildlife management system for the National Park Service as well as provide a very rich source of data concerning the effect of elevation on diversity and species composition of communities. The beetle-mammal relationships studied are limited to forested areas in the upper elevations in the tropics. Our studies show that these beetles fail to survive where the forest is opened by logging. Yet, these beetle-host relationships have great potential for providing unique insights into the way host-parasite interactions evolve, since it seems to be a relatively early stage of such a system. Potentially, this information may lead to greater understanding of the nature of all host-parasite interactions. The potential benefit of such understanding to mankind in improving control of harmful parasites is inestimable.

The possible benefits for mankind as well as the increased understanding of life on our own planet from study of tropical ecosystems is considerably greater than the most generous available estimates. The Field Museum's commitment to tropical biology, with the aid of donors such as the Rice Foundation, joins with the international scientific community to make this knowledge available before it is lost forever. FM

My Field Trip to Ulu Kinabatangan, North Borneo, With Robert Inger

By Chin Phui Kong

I MET ROBERT INGER for the first time in April or May, 1950, in my home town of Sandakan, Colony of North Borneo (now Sabah). He came to visit my office together with the late Dwight Davis.* They were in North Borneo on the Borneo Zoological Expedition of the Field Museum of Natural History. I had joined the Fisheries Department some 10 months earlier, and my first job in the department had been to conduct a survey of the fish fauna of the colony. After 10 months of intensive collection, my office was full of fish specimens—both marine and fresh-water. When they arrived, our conversations naturally concentrated on fishes. From that conversation it became apparent that Bob and I had many interests in common and our friendship started from there.

My next encounter with Robert Inger was in April, 1956—six years after we first met. This time we spent more than one month together. I took an active part accompanying him on his zoological expedition trip to Ulu Kinabatangan, or the upper course of the Kinabatangan River. The Kinabatangan is the longest river in North Borneo; it originates in the Witti Range in the interior, follows a course of some 560 km through rain forests, nipah and mangrove swamps, before emptying its muddy water into the Sulu Sea. The river is navigable by large launches as far as Lamag, and well beyond that point by smaller launches and shallow-draught crafts powered by outboard motors. Earlier Bob had bought supplies, recruited field workers and skillfully obtained a motored kumpit (an all-purpose sea-going native wooden boat) from the United Timbers Ltd. in Sandakan. The company had opened up a new logging camp at Deramakot (about 330 km from Sandakan) in Ulu Kinabatangan. A motored kumpit was a rare commodity in those days, and Bob obviously had made the right connections with the Forestry Department and the timber company's boss.

We set sail to Deramakot from Sandakan on the morning of the 18th April, 1956. A small motored kumpit named M/B *Pina* was loaded with our collecting gear, supplies, and with Gaun, our Iban hunter; Awang, the cook and two other workers. At Mumian, one of the estuaries of the Kinabatangan River and, about 30 km from Sandakan, we picked up more supplies— atap and kajang (local roofing and walling materials made of nipah leaves). We reached Sukau at 1630 hr and tied up at the Sheng Kee Timber Camp jetty. The Camp's kongsi (a long-house, including office stores, shop and hostel for timber workers) was situated on a slope some 9 m higher than the river in order that it would be above water during floods. The manager of the camp was very hospitable, and he invited Bob and me to stay at his kongsi for the night. We gladly accepted.

The next morning I was awakened by the sound of a gong at 0300 hr, which called the logging crew to get up. Bob and I got up at 0430 hr, had breakfast, and were on our way up the river by 0535 hr. The river was quiet, but covered with thick mist, which gradually thinned away when the sun rose. The going was smooth but for a 20-minute engine breakdown when we ran out of diesel fuel in the tank. There were many monkeys and wild pigs on the river banks. I counted 30 pigs before we reached Lamag. At about 1730 hr we passed by Bukit Garam, where the river was calm and glittering in the setting sunlight. It was very beautiful. We arrived at Lamag, the government's administration center of the Kinabatangan District, at

D. Dwight Davis (1908-65) was Curator of Vertebrate Anatomy at Field Museum.

Chin Phui Kong, now Aquacultural Consultant, was formerly Director of Fisheries, Fisheries Department, Sabah.

Field Museum's Borneo Zoological Expedition of 1956, with author Chin Phui Kong, front center, and Robert F. Inger, second from right. Others are native field crew. 93623

1830 hr. We were the guests of the Assistant District Officer, or ADO, Mr. Richard Lind,* for the night.

Day 3. We had planned to go fishing in the danau (a cut-off meander) in the morning, but were held back by heavy rain. We decided to proceed up river instead, and arrived at Pintasan at 1600 hr where we stopped for the night.

Day 4. We went up the Lokan River (a tributary of the Kinabatangan) in a jong-kong (a native dugout canoe), spending the morning looking for primary forest along the river. The search was fruitless. At one spot we came under a low hanging branch, where a 2-meter python was sleeping on the branch. Bob decided to catch the snake, and he started climbing up the branch. Suddenly, I felt something heavy drop on my head and the jong-kong was rocking severely. Then I saw the python shoot head-long into the river, and in a moment he was gone. When I came to my senses, I realized that the python had hit me before dropping into the boat; and the snake was just as frightened as I was. We proceeded up river again in the afternoon and arrived at Latangan at 1730 hr. We went fishing in a small stream until sundown.

Day 5. We left Latangan for Deramakot, our expedition site, in the early morning, and arrived at 0900 hr. Here the United Timbers Ltd. kongsi was situated even higher up on the bank than the one I had seen at Sukau. After unloading our gear, Bob and I set off almost immediately to inspect the nearby forest. We went out again in the afternoon to survey the Deramakot River, to select field stations for collecting fish and frogs. Other workers were busy building our camp just opposite the kongsi at the edge of a new clearing.

Days 6 to 30. Every day was a working day—weather permitting—except for one rest day for everybody, and one more for me when I caught cold. Zoological collection and gathering of meteorological and hydrological data were our main tasks at Deramakot. Fishing (which usually consumed the most manpower) was done mainly in the morning. Especially when fishing in the big river we turned out in full force. Frog collections were done at night. I learned much from Bob about frogs when I accompanied him on his frog-hunting trips. We did not catch many snakes, but we were able to get a fair number of skinks. The lizards were shot with a .22 pistol with

*Two years later, in the early 70's, Mr. Lind was appointed Chief Secretary of the Sabah Government—the No. 1 civil servant in the state.

dust-shots while they were basking in the morning sun. Hunting for birds and other small mammals was done singlehandedly by Gaun.

Afternoon times were usually spent preserving specimens, and writing down field notes and weather and river data. You would find Gaun skinning a tupai (tree-shrew) or musang (civet) that was shot in the morning, with a lighted cigarette hanging between his lips. In the late afternoon, after taking a bath in the river, you would find Bob in his colorful sarong working on his field notes.

Not all the fish specimens were caught by us. Occasionally the villagers brought in big catfish or ikan baung (*Pangasius* and *Mystus*) weighing 3 to 4 kg (6.6-8.8 lbs.) a piece. Bob gladly bought the fish. After taking measurements of the specimens and examining their stomach contents, I would cut off the head and the fins for preservation. The remaining body portions would be handed over to Awang, the cook, for our evening meals. One day, when the river was in flood, a native boy brought in a bundle of ikan kokok (*Leiocassis*). We already had collected many catfishes, so we decided to keep the smaller fish for specimens and sent the bigger ones to Awang. Luckily we kept the smaller fish, for they were later found to be a new species—*Leiocassis robustus*. All the catfishes we sampled at Deramakot were very delicious.

The workers had strong personal characters. Gaun, the Iban hunter from Sarawak Museum, who wore a big mustache, was a strong and dignified person and a true professional. One day I followed him on his hunting trip in the forest. When we reached a spot surrounded by tall trees, he stopped to listen and announced that there were animals in the trees. He then loaded his shotgun and watched carefully as some fragments of nuts dropped down from a tree. He told me calmly that kubong (flying lemur) was up there. It was a big tree, perhaps 30 or 35 m tall, and I could not make out the kubong from the leaves. Just as I was about to ask him to point out the kubong to me, I saw him lift up his shotgun and fire—and down came the kubong. The action was swift and neat, taking only a few seconds.

Awang, our cook, was a liar and a bad gambler. He lost all his pay gambling with the logging crew. One day during supper Bob asked him why a whole fish became a half fish after it was cooked by him. Awang denied any knowledge of the missing portion. About a year later, when I was invited to give advice on construction of a fish pond at the prison compound in Jesselton (now Kota Kinabalu), I was not surprised to find Awang among the prisoners.

Bilit, the manual worker, was a small and timid man, who smoked a homemade pipe. He was a keen field worker and a good fisherman. He went fishing in his leisure time and used to bring back good catches. He had never handled a pistol, until one day when he was allowed to use the .22 pistol loaded with dust-shot to hunt for lizards. He went into the jungle armed with the pistol, there he came face-to-face with an elephant. He fired a shot at the jumbo and ran back to the camp as fast as he could. As it came closer to the time to leave we did less field work and concentrated on packing. I checked through my fish notes and came up with a total of 48 species, which we collected during this trip.

Day 31. Last day in the camp. Heavy rain in the afternoon, but *Pina* arrived at 1700 hr as expected. We finished loading our belongings on board at 1800 hr. That evening we said good-bye to the manager of the timber camp, Mr. Lai Kim Foh, and his staff at the kongsi, and thanked them for their hospitality. We were all ready to leave the next morning.

Our return journey to Sandakan was very fast indeed. We boarded M/B *Pina* at 0545 hr at Deramakot and started to sail downstream. The river was still flooding and we reached Mumiang at 2300 hr in the clear moonlight. We had covered 300 km in less than 18 hours. The next morning we arrived in Sandakan.

In the years that followed, Bob and I maintained close contact. As a result, in 1959, we produced our first joint-authorship paper, entitled "New species of fresh-water catfishes from North Borneo" (Fieldiana: Zool., 39: 279-296). In 1960, through Bob's efforts, I was awarded a research fellowship by the U.S. National Science Foundation, which brought me to the Field Museum of Natural History to work with Bob on the fresh-water fish collection from North Borneo. Our joint effort led to the publication of the following papers:

1961. The Bornean cyprinoid fishes of the genus *Gastromyzon* Gunther. Copeia 1961: 166-176.

1962. The fresh-water fishes of North Borneo. Fieldiana: Zool., 45: 1-268.

I consider myself very fortunate to have met Bob. Through working together in the field and in the laboratory, I have gained in-depth knowledge and a refined skill in the science of ichthyology. More than 35 years have passed since we first met, but our friendship has never faded. While working together, Bob took the leading role and shouldered the "lion's share" of work and responsibility. I have always regarded him as my friend and teacher.

TIME FUTURE from TIME PAST

Launching Our $40,000,000 Capital Campaign

"Chicago has what will be the greatest of all museums, an institution magnificently endowed by the liberality of its own citizens, a permanent memorial of the glories of the summer of '93."—The *Chicago Times,* June 3, 1894

With those words, Chicago and the world were introduced to an institution that would become one of the world's preeminent museums.

Today, some 90 years after its founding, Field Museum is a vital research and teaching institution, as complex as any university. Is is a database for the world and a classroom for students of all ages. It is a record of living things, a notebook charting man's social development. It is a foundation for the future.

As it nears its centennial in 1993, Field Museum has the opportunity to reaffirm its position among the premier museums in the world through an ambitious ten-year plan known as Centennial Directions. To realize the plan's goals, the Museum has launched the second capital campaign in its history, *Time Future From Time Past.*

The Campaign seeks a minimum of $40 million to:

- ✓ Support endowment for research and collections
- ✓ Renew permanent exhibits and initiate new public programs
- ✓ Restore the landmark building and
- ✓ Maintain annual support during the campaign

The Museum looks to its many members, friends and the corporate and foundation community to help realize its goals. Earlier this year, on May 15, the Field Museum publicly announced its campaign goals during a reception and luncheon held in Stanley Field Hall. At that time $23.7 million had been raised. The total now stands at $27.5 million.

Shown here are scenes from the May 15 event at which the campaign was announced.

MacArthur Foundation Challenge Grant

The John D. and Catherine T. MacArthur Foundation Challenge Grant of $2,500,000 was announced at Field Museum's special campaign kickoff on May 15.

The MacArthur Foundation Grant will match all contributions from individuals pledging $10,000 or more. The challenge has already encouraged many friends of the Museum to make gifts at least at that level.

MacArthur Foundation's investment in Field Museum will continue to support the Museum's important research, education and exhibition projects.

Among those present at the May 15 Capital Campaign announcement ceremonies were (above, left to right) Mr. James W. Thurman, MacArthur Foundation executive vice president, Mr. Blaine J. Yarrington and Mr. John S. Runnells, Field Museum trustees; Field Museum President Willard L. Boyd; Mrs. Philip D. Block, Jr., Jimmie W. Croft, Field Museum vice president, Finance and Museum Services, and Mrs. Theodore D. Tieken, Field Museum trustee. Below: Field Museum Trustee Marshall Field is at the podium, with Richard M. Jones, chairman of Field Museum's Board of Trustees (center), and President Boyd. The photo at lower left shows the Capital Campaign dinosaur after unveiling. The dinosaur serves as an indicator of the campaign's progress, a lavender color advancing upward from the lower body as funds are raised. Photos by Diane Alexander White 84395

Campaign Leadership

Campaign Chairman
Richard M. Jones

Board Fund Chairman
Marshall Field

Leadership Gifts Chairman
William L. Searle

Leadership Gifts Vice Chairmen
Thomas E. Donnelley II
Robert A. Pritzker

Foundations Division Chairman
Willard L. Boyd

Individuals Division Chairman
Mrs. T. Stanton Armour

Corporate Division Chairman
Leo F. Mullin

Collectors Division Chairman
Theodore W. Van Zelst

Other Key Volunteers in the Campaign

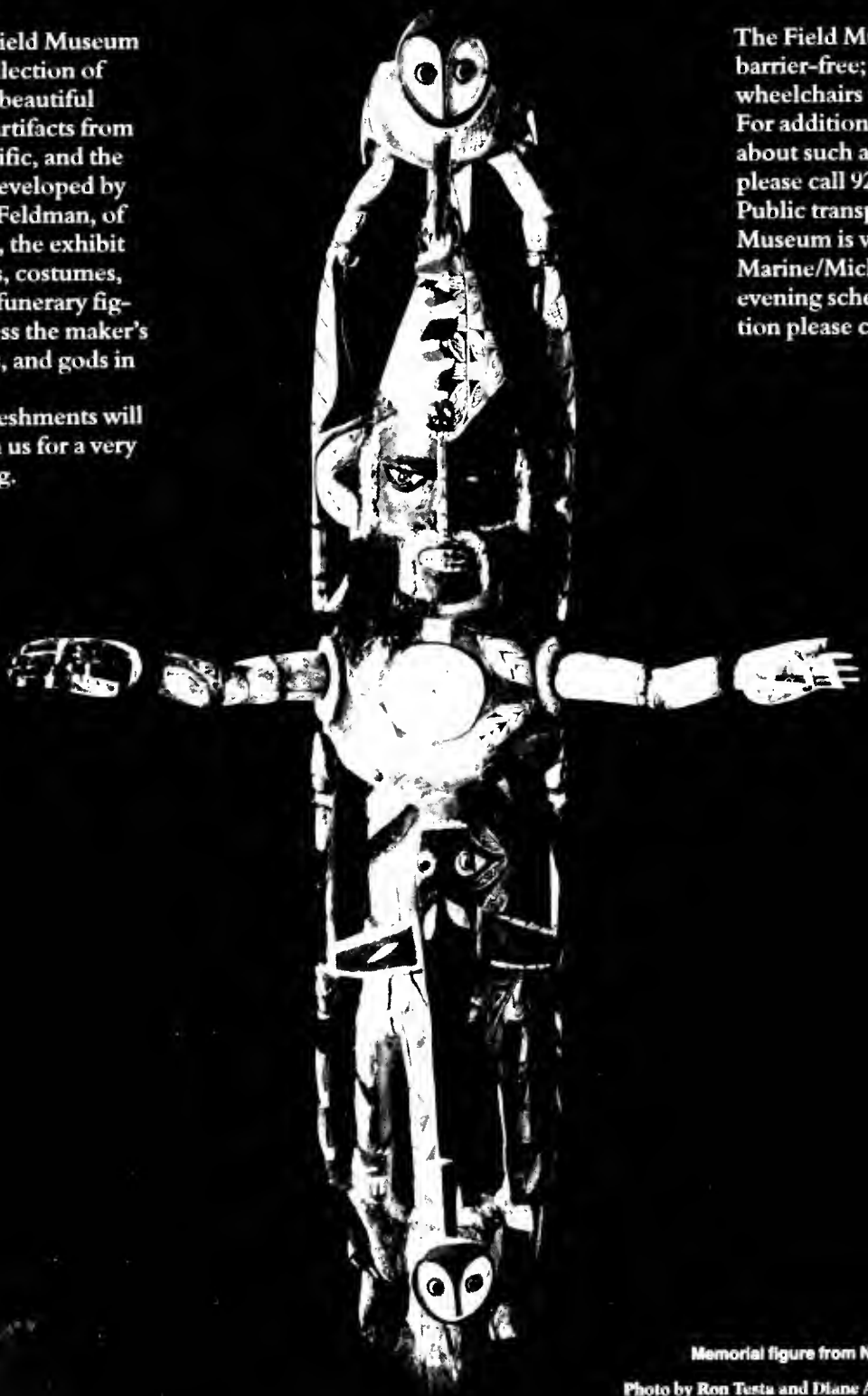
Mrs. Philip D. Block III
Thomas J. Eyerman
James J. O'Connor
Mrs. Malcolm N. Smith
E. Leland Webber
Blaine J. Yarrington

Gods, Spirits, and People: The Human Image in Traditional Art

Members' Preview: Friday, November 21, 5:00 pm-9:00 pm

Join us at the Field Museum to view our collection of more than 135 beautiful and symbolic artifacts from Africa, the Pacific, and the New World. Developed by Dr. Robert A. Feldman, of Field Museum, the exhibit includes masks, costumes, and ritual and funerary figures that express the maker's identity, spirits, and gods in human form.

Light refreshments will be served. Join us for a very special evening.



The Field Museum is barrier-free; strollers and wheelchairs are available. For additional information about such arrangements, please call 922-9410, ext 453. Public transportation to the Museum is via the CTA #146 Marine/Michigan bus. For evening schedule information please call 836-7000.

Memorial figure from New Ireland, 5'6", 138800

Photo by Ron Testa and Diane Alexander White 109922

Founders' Council Honors Roger Tory Peterson

Photo by Ron Testa 84513

A LIFETIME'S DISTINGUISHED DEDICATION to natural history has eminently qualified Roger Tory Peterson for an honor recently accorded him by Field Museum's Founders' Council. The council's Award of Merit was bestowed on Peterson at a September 8 awards dinner in recognition of his outstanding work as a painter and photographer of wildlife, natural history writer, editor, and conservationist. Peterson has done more than any other individual in the popularization of natural history field guides, with which his name is practically synonymous.

Another honor was accorded Peterson recently in a newly discovered bird species being named for him. The cinnamon screech-owl, recently discovered in the foothills of the Peruvian Andes, has been given the scientific name *Otus petersoni,* also in recognition of Peterson's achievements. Co-discoverers of the owl were John W. Fitzpatrick, chairman of Field Museum's Department of Zoology and curator of Birds, and John P. O'Neill, coordinator of Field Studies and artist-in-residence at Louisiana State University's Museum of Natural Science. The September 8 award program included a presentation by Fitzpatrick and O'Neill: "Naming a New Owl after a Legendary Birder: A Tribute to Roger Tory Peterson."

Founders' Council Chairman Henry T. Chandler (above, left) presented the Award of Merit and a check for $1,000 to Peterson. Chandler also expressed gratitude to Mr. and Mrs. John B. Judkins, Jr., chairmen of the Award of Merit Dinner, which was sponsored by Houghton Mifflin Company, publisher of the renowned "Peterson Field Guide Series."

The Award of Merit is presented from time to time by the council to persons who have made significant contributions to the elements of the stated purpose of Field Museum: "To preserve, to increase and to disseminate knowledge of natural history; and to enhance in individuals the knowledge of and delight in natural history."

Established in 1983, the Founders' Council is a distinguished support group consisting of individual and corporate donors who provide leadership and financial assistance to the Museum. The council focuses on the Museum's incomparable collections and the renowned international research conducted by the curatorial staff. Further information about the council may be obtained by calling Susan VandenBosch, director of Individual Giving, 322-8878.

FIELD MUSEUM TOURS

Sailing to the Land of the Maya Aboard the Tall Ship *"Sea Cloud"* February 14-24

Itinerary

Day 1
Miami/Georgetown, Grand Cayman

Depart Miami on a regularly scheduled flight to Georgetown, the principal town of Grand Cayman, largest of the three Cayman Islands. Columbus named the island Las Tortugas ("The Turtles") in 1503, for the giant sea turtles that inhabit the region. The flat, sandy island is peopled by descendants of Cromwell's soldiers, buccaneers, and shipwrecked sailors.

Upon arrival, transfer to the *Sea Cloud* and sail late afternoon.

Day 2
At Sea

Sailing due southwest in the Western Caribbean.

Day 3
Swan Island

Morning arrival at tiny Swan Island, a yachtsman's paradise. The coral limestone island is only 1½ miles long and 60 feet high. Formerly the site of a plantation, today only about 20 people inhabit the island.

Day 4
Roatan, Bay Islands

Morning at sea with afternoon arrival at Roatan, the largest of the Bay Islands in the Gulf of Honduras. Roatan was first settled by buccaneers who found the reef-locked harbors and lagoons perfect hideouts for raiding treasure ships.

Swim or snorkel in the blue-green reefs and explore the beautiful island on your own, enjoying the densely wooded hills, mountainous terrain, and quiet unspoiled atmosphere.

Day 5
Cochino Grande

Morning arrival at Cayos Cochinos, of Hog Cays. This delightful archipelago between Roatan and the Honduran mainland is an exotic tropical paradise reminiscent of the South Pacific. Time at leisure for swimming off the magnificent tranquil beaches and for snorkeling. Enjoy the afternoon at sea.

Day 6
Puerto Barrios/Tikal/Puerto Barrios

Early morning arrival in the Guatemalan port of Puerto Barrios for an optional full-day excursion by air to Tikal,

For reservations, call or write Dorothy Roder (322-8862), Tours Manager, Field Museum, Roosevelt Rd. at Lake Shore Dr., Chicago, Il 60605

one of the oldest and most beautiful of all Mayan sites. Located deep in the Peten Jungle, Tikal was occupied from at least 600 B.C. through the ninth century A.D. It is thought to have been the most important Mayan center of the Classic period.

A tour of the site includes the Great Plaza and several of the flat-topped pyramids towering above the rain forest. The structures support beautifully decorated temples where the priest-astronomers charted the motion of the stars.

Day 7
Half Moon Cay, Lighthouse Reef, Barrier Reef of Belize

Morning arrival in Belize's barrier reef, the world's second largest, stretching for more than 120 miles. Undiscovered by the cruise liners and mass tourism, the area is a paradise for sailors, snorkelers, and nature lovers. The reef community constitutes the earth's oldest and most complex ecosystem, dating back two billion years. The inner mangrove cays are covered with impenetrable growth, and on the outer sandy cays tall palm trees fringe sandy beaches.

Spend the day at Lighthouse Reef exploring the Blue Hole, a remarkable phenomenon that is part of an underwater national park. More than 15 miles long, the hole is surrounded by coral that rises to the surface of the lagoon.

Also visit several atolls of Lighthouse Reef, including Half Moon Cay, which has a large colony of red-footed boobies.

Day 8
At Sea

Enjoy a magnificent full day at sea on board the *Sea Cloud*.

Day 9
Playa Del Carmen/Tulum/Coba/Chichen Itza

Disembark in the morning at Playa Del Carmen, a small port on the Yucatan. Continue to Tulum, the City of Dawn. This isolated city overlooking the Caribbean is the only known Mayan shore-side settlement. Of the 50-plus structures within the walls, the Watchtower, Temple of the Frescoes, and Temple of the Descending God are the most fascinating.

After lunch depart for the majestic site of Coba, meaning "wind ruffled water." Situated amid five lakes, Coba was one of the largest Late Classic centers and resembles the site of Tikal in Guatemala in its numerous baffling causeways. Visit the pyramids of El Castillo and Nohoch Mal. Continue to Chichen Itza with accommodations at the *Hotel Mayaland*.

Morning and afternoon tours explore Chichen Itza, the magnificent metropolis and principal religious center of ancient Yucatan. Evidence of Toltec influence is obvious throughout the complex in motifs of feathered serpents, warriors, eagles, and jaguars. Visit the Great Pyramid, built to represent the Mayan calendar; the Temple of the Warriors, scene of sacrificial rites; the ceremonial ball court; and the astronomical observatory. Lunch is included. In the evening attend a farewell cocktail reception.

Day 10
Chichen Itza/Cancun or Merida/Miami

Transfer to the airport for the regularly scheduled return flight to Miami via Cancun or Merida.

Ron Testa

Guest Lecturer: John W. Fitzpatrick is curator of Birds and chairman of the Department of Zoology at the Field Museum. He received his Ph.D. in biology from Princeton in 1978. Fluent in Spanish, Dr. Fitzpatrick has extensive experience in Central and South America and in the Caribbean. He has lectured on numerous Field Museum tours, including a previous tour of the Lesser Antilles aboard the *Sea Cloud*. He is the author or more than 50 articles on birds and recently co-authored a prize-winning book on Florida scrub jays, published by Princeton University Press.

RATES

Stateroom Category	Description	One Person	Each of 2 Persons
Type C	Outside stateroom with one lower bed and an upper berth, shower. Staterooms 15, 17, 18, 20		$3,595
Type B	Outside stateroom with two lower beds, shower. Staterooms 21, 23, 24, 25, 26, 27, 28, 30		$3,995
Single Type B	Outside stateroom with lower bed, shower. Stateroom 29, 32	$5,495	
Type A	Outside stateroom with two lower beds, shower. Staterooms 19, 22, 31, 33, 34, 35, 36, 37, 38, 39, 40, 41		$4,395
Superior	Original outside stateroom with double bed, shower. Staterooms 5 (bathtub), 6, 10, 14		$5,095
Single Superior	Original outside stateroom with lower bed, shower, Stateroom 11	$6,595	
Deluxe	Original outside stateroom with double bed or two lower beds, private bathtub, shower. Staterooms 3, 4, 7		$5,495
Single Deluxe	Original outside stateroom with lower bed, shower. Stateroom 8	$6,995	
Suite	Original owners' suite. Outside with double bed, private bathtub, shower. Suites 1, 2		$6,895

Field Museum of Natural History
Membership Department
Roosevelt Road at Lake Shore Drive
Chicago, IL 60605-2499

FIELD MUSEUM OF NATURAL HISTORY BULLETIN

December 1986

TREASURES of Field Museum

1987 Calendar

Field Museum
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Bulletin

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December 1986
Volume 57, Number 11

THE TREASURES BALL, sponsored on November 7 by the Women's Board of Field Museum, put the spotlight on a group of specimens selected from the collections of the scientific departments and the library. Chosen for their beauty, scientific or historic interest, the specimens were on view in the South Lounge for just that special occasion. Several of those exceptional pieces are now on extended "exhibit" by being featured on the pages of this calendar issue. The cover photo, drawing other pieces from the collections, expresses the treasures theme in a symbolic sense: a leather Chinese chest, itself a treasure, overflows with an eye-dazzling variety of artifacts. The interesting concept was the original work of Field Museum Photographer Diane Alexander White and Photo Researcher Nina Cummings. Staff members Dorothy Eatough, Christine Gross, Cap Sease, Ron Testa, and Ben Williams and Volunteer Carolyn Moore were also helpful in the enterprise. Senior Scientific Illustrator Zbigniew Jastrzebski made the drawing below. Cover photo by Diane Alexander White. GN84567c.

Photo key: **A:** quartz crystal from Switzerland, gift of H.N. Higinbotham, H1316; **B:** Vancouver Island (Canada) mask, 19196; **C:** marble head, Roman, gift of S.L. James, 26756; **D:** marble child's hand, Ionian, 27470; **E:** wood male figure, Yoruba, Nigeria, gift of Dr. and Mrs. Jeffrey Hammer, 83058; **F:** painted clay vessel of head, face, and headdress, Chimbote, Peru, 100076; **G:** silver charm-box, Tibet, 123581; **H:** necklace of amber, coral, and turquoise, Tibet, 123738; **I:** belt with silver buckles inlaid with turquoise or coral, Tibet, 123765; **J:** silver earring with turquoise mosaic, Tibet, 123772; **K:** silver charm-box with turquoise mosaic, Tibet, 123824; **L:** button ornament of gilded metal, frame of inlaid kingfisher feathers around oval rose glass cabochon, Chekiang province, China, 232730; **M:** ivory vase with cover, China, gift of Louise L. Valentine, 233350; **N:** lime box of brass, silver, and copper, Tibet, gift of Mrs. A.W.F. Fuller, 235047; **O:** faience object, Egypt, Ptolemaic, 238423; **P:** royal ushebti (grave figurine), sandstone, Egypt, 238442; **Q:** hairpin of silver gilt, kingfisher feathers, imitation pearls and probably quartz, China, 254268; **R:** carved figure, Japan, 257520; **S:** silver and mosaic bracelet, Navajo, Arizona, gift of May W. Bloom Collection, 284181; **T:** girdle ornament of lapis lazuli, China, 126599; **U:** amber girdle pendant, China, 126601; **V:** girdle pendant of pink tourmaline, China, 126621; **W** (on box lid): gold ring, probably bracelet or armlet, Colombia, 153079; **W** (hanging from lid): gold ring, probably bracelet or armlet, Colombia, 153081; **X:** leather box, China, 253851; **Y:** silver necklace, Navajo, Arizona, gift of Mrs. R. F. Howe, estate of Mrs. Jane Warder Hodgeson, 83979; **Z:** *The Florist, Fruitist, and Garden Miscellany,* London, 1856, plates 119 and 120, from Mary W. Runnells Rare Book Room.

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	Average number of copies each issue preceding 12 months	*Actual number of copies single issue nearest to filing date*
Total copies printed	28,892	27,800
Paid circulation (sales through dealers, vendors, carriers)	none	none
Paid circulation (mail subscriptions)	24,963	24,354
Total paid circulation	24,963	24,354
Free distribution	219	571
Total distribution	25,182	24,925
Office use, left over	3,710	2,875
Return from news agent	none	none
Total	28,892	27,800

I certify that the statements made by me above are correct and complete. *Jimmie W. Croft,* vice president for Finance and Museum Services.

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Articles

Authors

Field Briefs

TREASURES OF ANTHROPOLOGY. Stirrup-spout bottles from Peru, Moche culture, ca. A.D. 400. Both bottles are exceptionally fine examples artistically and in terms of preservation. Left figure 12¼″ high, cat. 111378; right figure 10″ high, cat. 100060. Photo by Ron Testa and Diane Alexander White. 109925

JANUARY 1987

Field Museum of Natural History

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		December 1986 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	**February** S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28	**1** NEW YEAR'S DAY (Museum closed) sunrise 7 18am sunset 4 30pm	**2** sunrise 7 18am sunset 4 31pm	**3** sunrise 7 18am, sunset 4 32pm
4 *Perihelion (Earth 91,400,005 miles from Sun)* *Quadrantid meteor shower 40-150/hr (48 hr variable)* sunrise 7 18am sunset 4 33pm	**5** sunrise 7 18am, sunset 4 34pm	**6** ◐ *first quarter* sunrise 7 18am sunset 4 35pm	**7** sunrise 7 17am, sunset 4 36pm	**8** sunrise 7 17am sunset 4 37pm	**9** sunrise 7 17am sunset 4 38pm	**10** sunrise 7 17am sunset 4 39pm
11 sunrise 7 17am sunset 4 40pm	**12** sunrise 7 16am sunset 4 41pm	**13** sunrise 7 16am sunset 4 42pm	**14** ○ *full moon* sunrise 7 16am sunset 4 44pm	**15** sunrise 7 15am sunset 4 45pm	**16** sunrise 7 15am sunset 4 46pm	**17** sunrise 7 14am, sunset 4 47pm
18 sunrise 7 14am sunset 4 48pm	**19** Martin Luther King's Birthday sunrise 7 13am sunset 4 50pm	**20** sunrise 7 12am sunset 4 51pm	**21** sunrise 7 12am sunset 4 52pm	**22** ◑ *last quarter* sunrise 7 12am sunset 4 53pm	**23** sunrise 7 11am, sunset 4 55pm	**24** sunrise 7 10am, sunset 4 56pm
25 sunset 4 57pm	**26** sunrise 7 09am sunset 4 58pm	**27** sunrise 7 08am sunset 5 00pm	**28** sunrise 7 07am sunset 5 01pm	**29** Chinese New Year ● *new moon* sunrise 7 06am sunset 5 02pm	**30** sunrise 7 05am sunset 5 04pm	**31** sunrise 7 04am, sunset 5 05pm

TREASURES OF ANTHROPOLOGY: Bronze memorial head from Benin, formerly a native kingdom of Western Africa, now a province of Nigeria. Made by the lost-wax *(cire perdue)* process. Early 18th-early 19th cents. Height 11¾". Cat. 8148. Photo by Diane Alexander White. 109940

MARCH 1987

Field Museum of Natural History

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 sunrise 6 25am, sunset 5 41pm	**2** sunrise 6 24am, sunset 5 42pm	**3** sunrise 6 22am, sunset 5 43pm	**4** sunrise 6 20am, sunset 5 45pm	**5** sunrise 6 19am, sunset 5 46pm	**6** sunrise 6 17am, sunset 5 47pm	**7** ◐ *first quarter* sunrise 6 15am, sunset 5 48pm
8 sunrise 6 14am, sunset 5 49pm	**9** sunrise 6 12am, sunset 5 50pm	**10** sunrise 6 10am, sunset 5 52pm	**11** sunrise 6 10am, sunset 5 53pm	**12** sunrise 6 08am, sunset 5 54pm	**13** sunrise 6 06am, sunset 5 55pm	**14** sunrise 6 04am, sunset 5 56pm
15 Ides of March ○ *full moon* sunrise 6 03am, sunset 5 57pm	**16** sunrise 6 01am, sunset 5 59pm	**17** St. Patrick's Day sunrise 5 59am, sunset 6 00pm	**18** sunrise 5 58am, sunset 6 01pm	**19** sunrise 5 56am, sunset 6 01pm	**20** *first day of spring* sunrise 5 54am, sunset 6 02pm	**21** sunrise 5 52am, sunset 6 03pm
22 ◑ *last quarter* sunrise 5 51am, sunset 6 05pm	**23** sunrise 5 49am, sunset 6 06am	**24** sunrise 5 47am, sunset 6 07pm	**25** sunrise 5 45am, sunset 6 08pm	**26** sunrise 5 44am, sunset 6 09pm	**27** sunrise 5 42am, sunset 6 10pm	**28** sunrise 5 40am, sunset 6 11pm
29 ● *new moon* sunrise 5 39am, sunset 6 12pm	**30** sunrise 5 37am, sunset 6 14pm	**31** sunrise 5 36am, sunset 6 15pm				

February

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

April

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

TREASURES OF BOTANY. Life-size model of mountain roseBay (*Rhododendron catawbiense*), a commonly cultivated species native to the southern Appalachians. Field Museum's collection of realistic plant models, fabricated from glass, plastics, and other materials, is second to none. The bulk of these are on view in Plants of the World Hall. Photo by Ron Testa. 83229

APRIL 1987

Field Museum of Natural History

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
March S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	**May** S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	Times for sunrise and sunset are for Chicago, Central Standard Time. For Daylight Savings time add 1 hour.	**1** sunrise 5:34am, sunset 6:16pm	**2** sunrise 5:33am, sunset 6:17pm	**3** sunrise 5:31am, sunset 6:18pm	**4** sunrise 5:29am, sunset 6:18pm
5 Daylight Savings Time begins sunrise 5:27am, sunset 6:19pm	**6** ◐ *first quarter* sunrise 5:26am, sunset 6:20pm	**7** sunrise 5:24am, sunset 6:22pm	**8** sunrise 5:22am, sunset 6:23pm	**9** sunrise 5:21am, sunset 6:24pm	**10** sunrise 5:19am, sunset 6:25pm	**11** sunrise 5:17am, sunset 6:26pm
12 Palm Sunday sunrise 5:16am, sunset 6:27pm	**13** *penumbral eclipse of moon* ○ *full moon* sunrise 5:14am, sunset 6:28pm	**14** **PASSOVER** sunrise 5:12am, sunset 6:29pm	**15** sunrise 5:11am, sunset 6:31pm	**16** sunrise 5:09am, sunset 6:32pm	**17** Good Friday sunrise 5:08am, sunset 6:33pm	**18** sunrise 5:06am, sunset 6:34pm
19 **EASTER** sunrise 5:04am, sunset 6:35pm	**20** ◑ *last quarter* sunrise 5:03am, sunset 6:36pm	**21** *Lyrid meteor shower 10-15/hr (48 hr variable)* sunrise 5:01am, sunset 6:37pm	**22** sunrise 5:00am, sunset 6:38pm	**23** sunrise 4:58am, sunset 6:40pm	**24** sunrise 4:57am, sunset 6:41pm	**25** sunrise 4:55am, sunset 6:42pm
26 sunrise 4:54am, sunset 6:43pm	**27** ● *new moon* sunrise 4:52am, sunset 6:44pm	**28** sunrise 4:51am, sunset 6:45pm	**29** sunrise 4:50am, sunset 6:46pm	**30** sunrise 4:48am, sunset 6:47pm		


56750

TREASURES OF ANTHROPOLOGY. Stone effigy pipe; Hopewell Culture, Hopewell Group, North Fork, Ross County, Ohio; 200 B.C.-A.D. 400. Carved from pipestone, length 4⅛". Cat. 56750. Photo by Ron Testa. 110058

MAY 1987

Field Museum of Natural History

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		April S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	**June** S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	Times for sunrise and sunset are for Chicago, Central Standard Time. For Daylight Savings time add 1 hour.	**1** sunrise 4 47am sunset 6 49pm	**2** Field Museun opened 192 (Grant Park sunrise 4 47am, sunset 6 50pm
3 sunrise 4 45am, sunset 6 51pm	**4** *Eta Aquarid meteor shower 10-40/hr (48 hr variable)* sunrise 4 44am sunset 6 52pm	**5** ◐ *first quarter* sunrise 4 43am, sunset 6 53pm	**6** sunrise 4 40am sunset 6 54pm	**7** sunrise 4 39am sunset 6 55pm	**8** sunrise 4 38am sunset 6 56pm	**9** sunrise 4 37am sunset 6 57pm
10 Mother's Day sunrise 4 37am sunset 6 58pm	**11** sunrise 4 35am, sunset 6 59pm	**12** sunrise 4 34am sunset 7 00pm	**13** ○ *full moon* sunrise 4 33am sunset 7 02pm	**14** sunrise 4 32am sunset 7 02pm	**15** sunrise 4 31am sunset 7 03pm	**16** sunrise 4 30am, sunset 7 04pm
17 sunrise 4 29am sunset 7 05pm	**18** sunrise 4 28am sunset 7 06pm	**19** ◑ *last quarter* sunrise 4 27am sunset 7 07pm	**20** sunrise 4 26am sunset 7 08pm	**21** sunrise 4 25am, sunset 7 09pm	**22** sunrise 4 25am sunset 7 10pm	**23** sunrise 4 24am, sunset 7 11pm
24 sunrise 4 23am, sunset 7 11pm **31** sunrise 4 19am sunset 7 17pm	**25** MEMORIAL DAY sunrise 4 22am sunset 7 12pm	**26** sunrise 4 22am sunset 7 13pm	**27** ● *new moon* sunrise 4 21am sunset 7 14pm	**28** sunrise 4 20am sunset 7 15pm	**29** sunrise 4 20am sunset 7 16pm	**30** sunrise 4 19am, sunset 7 17pm

TREASURES OF ZOOLOGY. The most spectacular as well as the largest members of the butterfly kingdom are arguably the birdwings, or Ornithoptera, native to the islands of Southeast Asia and northern Australia. Posed on this floral group are (left) *Ornithoptera tithonus*, of West Irian; (top) *O. urvilliana*, of Papua New Guinea; and (right) *O. croesus lydius*, of Halmahera. Photo by Diane Alexander White. 93682

JUNE 1987

Field Museum of Natural History

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 sunrise 4:18am, sunset 7:18pm	**2** sunrise 4:18am, sunset 7:19pm	**3** sunrise 4:17am, sunset 7:20pm	**4** ◐ *first quarter* sunrise 4:17am, sunset 7:20pm	**5** sunrise 4:16am, sunset 7:21pm	**6** sunrise 4:16am, sunset 7:22pm
7 sunrise 4:16am, sunset 7:22pm	**8** sunrise 4:16am, sunset 7:23pm	**9** sunrise 4:15am, sunset 7:24pm	**10** sunrise 4:15am, sunset 7:24pm	**11** ○ *full moon* sunrise 4:15am, sunset 7:25pm	**12** sunrise 4:15am, sunset 7:25pm	**13** sunrise 4:15am, sunset 7:26pm
14 Flag Day sunrise 4:15am, sunset 7:26pm	**15** sunrise 4:15am, sunset 7:27pm	**16** sunrise 4:15am, sunset 7:27pm	**17** sunrise 4:15am, sunset 7:27pm	**18** ◑ *last quarter* sunrise 4:15am, sunset 7:28pm ☆	**19** sunrise 4:15am, sunset 7:28pm	**20** sunrise 4:15am, sunset 7:28pm
21 Father's Day *first day of summer* sunrise 4:15am, sunset 7:28pm	**22** sunrise 4:16am, sunset 7:29pm	**23** sunrise 4:16am, sunset 7:29pm	**24** sunrise 4:16am, sunset 7:29pm	**25** sunrise 4:16am, sunset 7:29pm	**26** ● *new moon* sunrise 4:17am, sunset 7:29pm	**27** sunrise 4:17am, sunset 7:29pm
28	**29**	**30**	**May** S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	**July** S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	Times for sunrise and sunset are for Chicago, Central Standard Time. For Daylight Savings time add 1 hour.	

(about 4 lbs.), shown here slightly larger than actual size, was found on Mindanao Island, the Philippines, in 1917 and acquired by Field Museum in 1921. Its importance lies in the fact that it is one of only a

ancient Indianized civilization of Indonesia and the Southeast Asia mainland. Cat. 109928. Photo by Ron Testa. 109935

JULY 1987

Field Museum of Natural History

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
June S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	**August** S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	Times for sunrise and sunset are for Chicago, Central Standard Time. For Daylight Savings time add 1 hour.	**1** sunrise 4 19am, sunset 7 29pm	**2** sunrise 4 19am, sunset 7 29pm	**3** *Aphelion (Earth 94,512,258 miles from Sun* sunrise 4 20am, sunset 7 28pm	**4** INDEPENDENC DA ◐ *first quarter* sunrise 4 21am, sunset 7 28pm
5 sunrise 4 21am, sunset 7 28pm	**6** sunrise 4 22am, sunset 7 28pm	**7** sunrise 4 22am, sunset 7 27pm	**8** sunrise 4 23am, sunset 7 27pm	**9** sunrise 4 24am, sunset 7 27pm	**10** ○ *full moon* sunrise 4 24am, sunset 7 26pm	**11** sunrise 4 25am, sunset 7 26pm
12 sunrise 4 26am, sunset 7 25pm	**13** sunrise 4 27am, sunset 7 25pm	**14** sunrise 4 28am, sunset 7 24pm	**15** sunrise 4 28am, sunset 7 23pm	**16** sunrise 4 29am, sunset 7 23pm	**17** ◑ *last quarter* sunrise 4 30am, sunset 7 22pm	**18** sunrise 4 31am, sunset 7 21pm
19 sunrise 4 32am, sunset 7 21pm	**20** sunrise 4 33am, sunset 7 20pm	**21** sunrise 4 34am, sunset 7 19pm	**22** sunrise 4 35am, sunset 7 18pm	**23** sunrise 4 34am, sunset 7 17pm	**24** sunrise 4 36am, sunset 7 16pm	**25** ● *new moon* sunrise 4 37am, sunset 7 16pm
26 sunrise 4 38am, sunset 7 15pm	**27** sunrise 4 39am, sunset 7 14pm	**28** sunrise 4 40am, sunset 7 13pm	**29** sunrise 4 41am, sunset 7 12pm	**30** *Delta Aquarid meteor shower 10-35/hr (48 hr variable)* sunrise 4 42am, sunset 7 11pm	**31** sunrise 4 43am, sunset 7 10pm	


NILE
BY
AMELIA B. EDWARDS

tion Against the Ohio Indians in the Year 1764, Philadelphia, 1765; gift of Stanley Field. Joannes Jonstonus: *Natural History of Birds,* Amsterdam, 1657; Ayer Collection. *Description de l'Egypt,* prepared by the French Commission on Egyptian Monuments by order of Napoleon,1809-1828. Amelia B. Edwards: *A Thousand Miles up the Nile,* London, 1877. Charles Belanger: *Voyage aux Indes Orientales,* Paris, 1825-29; gift of Stanley Field. George Edwards: *A Natural History of Birds,* London, 1802-06; post-Augsberg, 1496. Center, left: Henry L. Meyer: *Coloured Illustrations of British Birds.* London, 1842-57; Ayer Collection. Center, right: Charles Darwin: *On the Origin of Species,* London, 1859, first edition, first issue; gift of Mr. and Mrs. John Runnells. Miniature volume above the Darwin: Hand-written manuscript in Garmuthi, the script in which the sacred books of the Indian Sikhs are written; gift of Henry Steel Olcott. Photo by Diane Alexander White. 84478

AUGUST 1987

Field Museum of Natural History

July

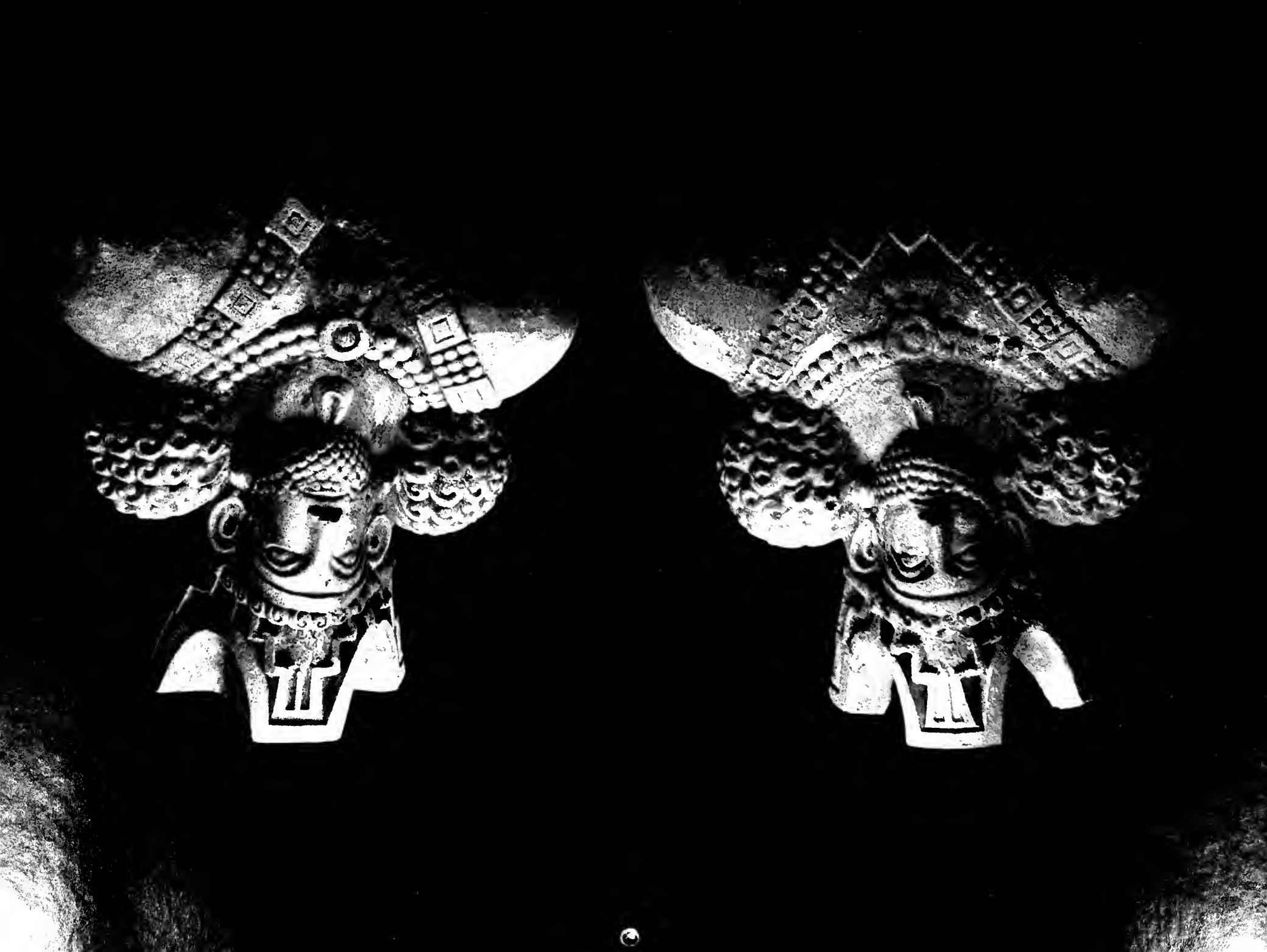
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

September

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

Times for sunrise and sunset are for Chicago, Central Standard Time. For Daylight Savings time add 1 hour.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 sunrise 4 44am, sunset 7 09pm
2 ◐ *first quarter* sunrise 4 45am, sunset 7 08pm	**3** sunrise 4 46am, sunset 7 07pm	**4** sunrise 4 47am, sunset 7 05pm	**5** sunrise 4 48am, sunset 7 04pm	**6** sunrise 4 50am, sunset 7.03pm	**7** sunrise 4 51am, sunset 7 02pm	**8** sunrise 4 52am, sunset 7.00pm
9 ○ *full moon* sunrise 4 53am, sunset 6 59pm	**10** sunrise 4:34am, sunset 6 58pm	**11** *Perseid meteor shower 50-100/hr Aug. 11-13 (48 hr variable)* sunrise 4 55am, sunset 6 56pm	**12** sunrise 4 56am, sunset 6 55pm	**13** sunrise 4 57am, sunset 6 54pm	**14** sunrise 4 57am, sunset 6 52pm	**15** sunrise 4 58am, sunset 6 51pm
16 ◑ *last quarter* sunrise 4 59am, sunset 6 49pm	**17** sunrise 5 00am, sunset 6 48pm	**18** sunrise 5 01am, sunset 6 46pm	**19** sunrise 5 02am, sunset 6 45pm	**20** sunrise 5 03am, sunset 6 43pm	**21** sunrise 5 04am sunset 6 42pm	**22** sunrise 5 05am, sunset 6 40pm
23 sunrise 5 06am sunset 6 38pm	**24** ● *new moon* sunrise 5.08am, sunset 6 37pm	**25** Islamic New Year (begins at sunset)	**26**	**27**	**28**	**29**
30	**31** ◐ *first quarter*					



TREASURES OF ANTHROPOLOGY. Stucco busts from Iraq, ca. A.D. 309-373 (?). These busts represent Shapur II, who reigned during that period. They were found in the late 1920s at Kish, a site excavated by the late Henry Field, former Field Museum curator. Height 20". Cat. 236400A, B. Photo by Ron Testa and Diane Alexander White. 109938

SEPTEMBER 1987

Field Museum of Natural History

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
August S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	**October** S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	**1** sunrise 5 16am, sunset 6 24pm	**2** sunrise 5 17am, sunset 6 22pm	**3** sunrise 5 18am, sunset 6 20pm	**4** sunrise 5 19am, sunset 6 19pm	**5** sunrise 5 20am, sunset 6 17pm
6 sunrise 5 21am, sunset 6 15pm	**7** LABOR DAY ○ *full moon* sunrise 5 22am, sunset 6 14pm	**8** sunrise 5 23am, sunset 6 13pm	**9** sunrise 5 24am, sunset 6 11pm	**10** sunrise 5 26am, sunset 6 09pm	**11** sunrise 5 27am, sunset 6 07pm	**12** sunrise 5 28am, sunset 6 06pm
13 sunrise 5 29am, sunset 6 04pm	**14** ◑ *last quarter* sunrise 5 30am, sunset 6 02pm	**15** sunrise 5 31am, sunset 6 00pm	**16** Field Museum founded 1893 sunrise 5 32am, sunset 5 59pm	**17** sunrise 5 33am, sunset 5 57pm	**18** sunrise 5 34am, sunset 5 55pm	**19** sunrise 5 34am, sunset 5 53pm
20 sunrise 5 35am, sunset 5 52pm	**21** sunrise 5 36am, sunset 5 50pm	**22** ● *new moon* sunrise 5 37am, sunset 5 48pm	**23** *first day of fall* sunrise 5 39am, sunset 5 46pm	**24** ROSH HASHANA sunrise 5 40am, sunset 5 45pm	**25** sunrise 5 41am, sunset 5 43pm	**26** sunrise 5 43am, sunset 5 41pm
27	**28**	**29**	**30** ◐ *first quarter*	Times for sunrise and sunset are for Chicago, Central Standard Time. For Daylight Savings time add 1 hour.		

TREASURES OF ZOOLOGY. Great auk *(Pinguinus impennis)*, acquired by Field Museum in 1966. This flightless species, once common in the North Atlantic, became extinct in 1844. Field Museum's specimen, one of about 80 in existence, is about 27½" high and was the model used by Audubon for his painting in *Birds of America*. Photo by Ron Testa. 93687

OCTOBER 1987

Field Museum of Natural History

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	September S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	**November** S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	Times for sunrise and sunset are for Chicago, Central Standard Time. For Daylight Savings time add 1 hour.	**1** sunrise 5:47am, sunset 5:33pm	**2** sunrise 5:48am, sunset 5:32pm	**3** YOM KIPPUR sunrise 5:49am, sunset 5:30pm
4 sunrise 5:50am, sunset 5:28pm	**5** sunrise 5:51am, sunset 5:26pm	**6** *penumbral eclipse of moon* ○ *full moon* sunrise 5:53am, sunset 5:25pm	**7** sunrise 5:54am, sunset 5:23pm	**8** sunrise 5:55am, sunset 5:21pm	**9** *Draconid meteor shower 10/hr (48 hr variable)* sunrise 5:56am, sunset 5:20pm	**10** sunrise 5:57am, sunset 5:18pm
11 sunrise 5:58am, sunset 5:16pm	**12** Columbus Day sunrise 5:59am, sunset 5:15pm	**13** sunrise 5:59am, sunset 5:13pm	**14** ◑ *last quarter* sunrise 6:01am, sunset 5:11pm	**15** sunrise 6:02am, sunset 5:10pm	**16** sunrise 6:03am, sunset 5:08pm	**17** sunrise 6:04am, sunset 5:07pm
18 sunrise 6:05am, sunset 5:05pm	**19** sunrise 6:06am, sunset 5:03pm	**20** *Orionid meteor shower 10-70/hr (48 hr variable)* sunrise 6:08am, sunset 5:02pm	**21** sunrise 6:09am, sunset 5:00pm	**22** ● *new moon* sunrise 6:10am, sunset 4:59pm	**23** sunrise 6:11am, sunset 4:57pm	**24** Unite Nation Da sunrise 6:12am, sunset 4:56pm
25 Daylight Savings Time ends	**26**	**27**	**28**	**29** ◐ *first quarter*	**30**	**31** Hallowe

TREASURES OF ANTHROPOLOGY. Bronze cat from Egypt; Late Period, about 600 B.C. Said to be from Saqqara. This is *one* of the finest Egyptian cats in existence; acquired by Edward E. Ayer in 1895 and given to Field Museum by Watson F. Blair. Cat. 30286. Photo by Ron Testa. 109926

DECEMBER 1987

Field Museum of Natural History

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
November S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	**January 1988** S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	**1** sunrise 6:58am, sunset 4:21pm	**2** sunrise 6:59am, sunset 4:21pm	**3** sunrise 7:00am, sunset 4:20pm	**4** sunrise 7:01am, sunset 4:20pm	**5** ○ *full moon* sunrise 7:02am, sunset 4:20pm
6 sunrise 7:03am, sunset 4:20pm	**7** sunrise 7:04am, sunset 4:20pm	**8** sunrise 7:05am, sunset 4:20pm	**9** sunrise 7:05am, sunset 4:20pm	**10** sunrise 7:06am, sunset 4:20pm	**11** sunrise 7:07am, sunset 4:20pm	**12** sunrise 7:08am, sunset 4:20pm
13 *Geminid meteor shower 50-80/hr (48 hr variable)* ◑ *last quarter* sunrise 7:09am, sunset 4:20pm	**14** sunrise 7:10am, sunset 4:20pm	**15** sunrise 7:10am, sunset 4:20pm	**16** **HANUKKAH** sunrise 7:11am, sunset 4:21pm	**17** sunrise 7:12am, sunset 4:21pm	**18** sunrise 7:12am, sunset 4:21pm	**19** sunrise 7:13am, sunset 4:22pm
20 ● *new moon* sunrise 7:13am, sunset 4:22pm	**21** sunrise 7:14am, sunset 4:23pm	**22** *Ursid meteor shower 10-15/hr (48 hr variable)* *first day of winter* sunrise 7:14am, sunset 4:23pm	**23** sunrise 7:15am, sunset 4:24pm	**24** sunrise 7:15am, sunset 4:24pm	**25** **CHRISTMAS** (Museum closed) sunrise 7:16am, sunset 4:25pm	**26** sunrise 7:16am, sunset 4:26pm
27 ◐ *first quarter*	**28**	**29**	**30**	**31**		

Field Museum of Natural History
Membership Department
Roosevelt Road at Lake Shore Drive
Chicago, IL 60605-2499