

EXPLORERS COME BACK FROM 'ANOTHER WORLD' IN BORNEO

By D. DWIGHT DAVIS
CURATOR OF VERTEBRATE ANATOMY

The members of the Borneo Zoological Expedition returned to Chicago recently, after nearly five months of field study and collecting in North Borneo. The writer, accompanied by Robert F. Inger, Assistant Curator of Fishes, traveled by air around the world, stopping along the way at Manila,

Chicago. It has a constantly damp tropical climate, with more than 130 inches of rain a year, compared with about 30 inches for Chicago. There are no wet and dry seasons in Borneo as there are in many other parts of the tropics; the seasons are only wet and slightly less wet.

The island was originally covered with dense tropical rain forest, which remains

ly lighted even on the brightest days. There is almost no variation from day to day, and little even between day and night. Botanical writers have compared the forest to a gigantic hothouse.

It is not surprising that some of the most interesting animals on earth should live in the damp windless world enclosed by this forest, many of them spending their lives in the trees. To learn something of the habits and behavior of these creatures was the main objective of the Borneo Zoological Expedition. Studies centered primarily on mammals, frogs and toads, and fishes, but other animals were collected.

LIKE ANOTHER PLANET'S LIFE

It is almost impossible to convey in words an adequate idea of what a tropical rain forest is like. Description depends ultimately on comparisons with things that are already known to the reader, and there is too much in the rain forest that has no counterpart in the experience of one who has never seen it. It is almost like trying to imagine what life on another planet might be like.

How can one describe the indescribable sensation of watching several dozen blood-thirsty land leeches converging on you from all directions, their grotesque blind gropings bringing them relentlessly nearer and nearer, their sightless probings following your every movement? How meaningful to one who has not seen them is the statement that many of the huge trees sprout in the tops of other trees, which they gradually engulf in a strangling woody clutch until the corpse of the original tree slowly rots away? Who can visualize, from words alone, frog nests hanging, birdlike, high in the trees?

A stupid-looking mammal, blinking in the beam of a flashlight during a nocturnal hike, is the descendant, almost unchanged, of the very first mammals on earth, more than 50 million years ago. No word picture can do justice to this creature out of the past, once progressive and modern compared with his fellows but now a by-passed relic.

'HEAD-HUNTERS' FRIENDLY SOULS

Almost as important are the things about the tropical forest that are not true. Many
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IN THE BORNEO RAIN FOREST

Gigantic trees form a dense green canopy. The tree shown is a kayu rajah, the "king of the forest." The rain forest is perpetually gloomy, damp, and windless.

Singapore, Kuching, Paris, and London to study collections in natural history museums. Headquarters were established at Sandakan, North Borneo. The collections made by the expedition were shipped by boat and have not yet arrived in Chicago.

Borneo, the third largest island in the world, lies squarely on the equator, almost exactly halfway around the world from

green the year around in the absence of a dry season. Much of this forest has been destroyed by the natives, who have cut down and burned over huge tracts in connection with their primitive agriculture. In northeastern Borneo, where the Museum's expedition operated, the natives are hunters and fishermen and here the forest is intact over thousands of square miles. The immensity of the forest is best appreciated from an airplane. Hour upon hour the plane flies over uninterrupted forest, the endless carpet of trees broken only by occasional glimpses of rivers.

PERPETUAL HUMIDITY PLUS!

This eternally green forest is one of the most remarkable habitats in the world. The trunks of gigantic trees, often six to eight feet in diameter and branchless for 80 feet or more, are the skeleton of the forest. The crowns of these mighty trees form a continuous green canopy, the dense roof of the forest. Beneath the trees it is perpetually humid and windless, only dim-



'WHITE SHREW'

This native of Borneo, Sumatra, and the Malay Peninsula is one of the most primitive of living mammals. In spite of its ratlike appearance it is related to the hedgehog of Europe.



MUD SKIPPER

A fish that spends most of its time out of water. It is of interest to biologists because, like certain prehistoric fishes that gave rise to amphibians, it has solved the problem of coming out of the water and moving about on land.

HEAD-HUNTERS IN FIGHT AGAINST TERRORISTS

By WILFRID D. HAMBLBY
CURATOR OF AFRICAN ETHNOLOGY

Perhaps the word "Dyak" would not arrest the attention of the general reader, but the name at once catches the eye of an anthropologist. Recently a Chicago daily newspaper, whose correspondent has been covering the news in Indonesia, mentioned the Dyak jungle dwellers who have been introduced into that region from the island of Borneo.

The Dyaks have been brought to Indonesia with earnest business in view. Their well-known prowess as forest guides and, formerly, as head-hunters earned for them a new appointment. They feel quite at home searching the forests of Indonesia for bands of thugs and political terrorists. These fly-by-night bandits excel in creeping up on peaceful homes under cover of darkness, and many murders have been committed. The Dyaks are good at this kind of midnight prowling, and no doubt enter into the pursuit with real zest. When they make a capture, the Dyaks are not likely to err on the side of leniency. It is a case of like against like—stealth is matched against cunning.

WHO ARE THE DYAKS?

As usual the anthropological facts are complicated and not easy to disentangle. It is enough to say that the Dyaks come from Borneo and may have some Hindu and Javanese blood. There may be a dash of Chinese in some of them, since the Chinese have traded in Borneo for centuries. Dyaks are classed as Land Dyaks and Sea Dyaks and differ somewhat in physical appearance. But the general verdict is that Dyaks have a Mongoloid look.

The black hair is long and straight, plentiful on the head but sparse on the face. Cheek bones are prominent and faces are broad. The eyes are black and slightly slanting. Skin color varies from light brown to dark brown, with a yellowish tinge in certain lights. The teeth are stained from chewing betel nuts. The stature is medium to short, never tall. The build is pleasing and athletic.

HEAD-HUNTING WITH A SMILE

Many of the Dyaks, though inveterate head-hunters, are of a bright and cheerful disposition. Those who know them report that they are sociable and talkative. The Land Dyaks have a separate house for human heads, and this dwelling is the dormitory for all young bachelors of the village. Dr. Charles Hose, my personal friend, spent a lifetime in Borneo and knew the Dyaks well. He says that the Land Dyaks do not tattoo their faces or bodies, but that, on the contrary, the Sea Dyaks (sometimes called Iban) are elaborately tattooed.

Of head-hunting, Dr. Hose said that the Ibans have a terribly morbid desire to take

heads. If unsuccessful in other ways, a war party will rob the tombs in villages of other tribes. After smoking the stolen heads these trophies are taken home in triumph, and the returning warriors boast that they had a terrific fight. They seem ashamed to come home without some evidence of success.

As the facts accumulate, the reader begins to understand that the young Dyaks are not necessarily bloodthirsty and sadistic. There must be some obscure motive, a hidden urge. What can it be? Here it is! Women incite the men to be successful warriors and head-hunters. What is more, a girl will taunt a suitor who returns without the head that is supposed to be a guarantee of his courage and skill.

The women seem to have quite a way of their own in handling the men. When a



DYAK HEAD-HUNTER

Life-size figure in Malaysian exhibit (Hall G).

man is married he goes to live with his wife's people for several years, a circumstance that should have a taming influence. The young male Dyak is supposed to have a dual personality: he is expected to be skilled in warfare and head-hunting and yet be amenable to feminine discipline. The custom of the newly wed husband joining the wife's household is common enough. Anthropologists use such words as "matrilocal" and "matriarchal" to describe the practice.

The Museum's exhibit of articles made by the Dyaks (Cases 45 and 47 in Hall G) indicates considerable craftsmanship among the Dyaks. There are blowguns and darts

NATURE PHOTO EXHIBIT DEADLINE NEAR

The attention of all who are interested in nature photography, whether as amateurs or professionals, is called to the fact that January 15 is the deadline for entries for the Sixth Chicago International Exhibition of Nature Photography. This exhibit will be held at the Museum February 1 to 28 under the auspices of the Nature Camera Club of Chicago and the Museum.

Silver medals and ribbons will be awarded in the various print and slide classifications. Entry forms and a complete resume of conditions of the contest may be obtained from the Museum.

The exhibition will be composed of two divisions, prints and transparencies. No more than four entries may be submitted in either division. There are three classifications in each division. They are: *Animal Life*—animals, birds, insects, tracks, nests, etc. (no domestic animals); *Plant Life*—flowers (except formal arrangements), trees, shrubs, fungi, etc.; *General*—scenery, geology, clouds, etc. (not included above). Prints (except from foreign contributors) must be mounted on 16" x 20" mounts. Color slides or transparencies should not exceed 3 1/4" x 4".

The judges will be: Conrad Emanuelson, photographer; John W. Moyer, Chief of the Museum's Division of Motion Pictures; Dr. Rainer Zangerl, the Museum's Curator of Fossil Reptiles; R. Marlin Perkins, Director of Lincoln Park Zoo; and Merrill Tilden, photographer.

for these, spears with well-made iron points, shields of rattan, and war caps. Only men who have taken heads may wear war caps, which are decorated with feathers of the Argus pheasant and the hornbill, a sacred bird.

The Dyaks, in common with most primitive people, believe in ghosts and spirits, and the grotesque masks used in connection with magico-religious ceremonies are shown. There is a musical instrument well designed on the organ-pipe principle—several tubes of different lengths are bound together, and each pipe has a note that is the result of the length of the air column. Bark cloth neatly made into clothes for children and examples of weaving and dyeing are displayed. Brass work is represented by cleverly made receptacles for the lime used with betel-nut chewing.

Evidently when not engaged in less reputable pursuits the Dyak is a competent artisan. The white man sternly repressed head-hunting in Borneo but now gives the Dyak the nod to go ahead and indulge his whim in Indonesia. Considering the stealthy murders that have been committed by Indonesian outlaws, one cannot help wishing the Dyaks good luck as they are sent in pursuit of the brigands.

EVERGREEN CHRISTMAS: SOME LEGENDS OF HOLIDAY PLANTS

BY JULIAN A. STEYERMARK
ASSOCIATE CURATOR OF THE HERBARIUM

WHETHER it be in connection with the development of various new commodities for the market, such as television, automobiles, washing machines, or electric refrigerators, North American industry

Christmas-tree ceremony is still shrouded in uncertainty. No one seems sure of just where or when the custom started. Yet most people in the United States go about buying trees and decorating them for the holidays as if this were originally an American custom. It has been estimated that

pagan deities], but loving gifts and rites of kindness."

Symbol of Hope and Love

The Vikings have their legend that "the Lord, in the 9th century, dispatched his emissaries, Faith, Hope, and Charity, earthward to select the first Christmas tree. Tradition has it that they chose the balsam fir because it bore many crosses on every twig and branch, was high as hope and as wide as love."

Among the French and Germans, folklore credits Bonchevalier with the discovery of the first Christmas tree. "Walking through the forest one Christmas Eve, he beheld a tall evergreen, brilliantly aglow with shimmering candlelight and crowned with an iridescent halo. His mother later interpreted this phenomenon by stating that Bonchevalier had seen the 'Tree of Humanity' and that the candles represented the people all over the world, while the halo at the tree's crest was the Christ Child watching over all."

A similar story is told about Martin Luther—that he became enchanted on Christmas night in 1550 by the sparkling of the stars and the glistening reflection of the moonbeams on snow-flecked evergreens. This led him to cut down a small tree, take it home with him, and place it on a table. To the delight of his small children, he decorated the tree with many small lighted candles to simulate the beautiful sights he had seen earlier that evening in the forest.

The Scandinavians are thought by some investigators to have originated the Christmas tree on the basis of their early Christmas practice of erecting poles for supporting sheaves of grain as a Christmas gift for the birds. Still others claim that the first Christmas trees were fruit trees, which were potted months ahead of time and brought into the house to be in full bloom for Christmas. It is recorded that an Arab geographer of the 10th century noted that trees and flowers await bloom on Christmas. According to a French epic, candles were first seen on a flowering Christmas tree in the 13th century, while another legend credits the rod of Joseph of Arimathea with flowering at Christmas at Glastonbury and elsewhere in England. This last legend is built around a hawthorn tree (*Crataegus* sp.) that is supposed to have blossomed at this time. Today our Christmas trees blossom out with lights and shining ornaments.

Pagan Festivals

Many do not accept the above stories as symbolizing the celebration of the birth of the Christ Child, for they argue that similar customs were in existence more than 5,000 years before the birth of Christ. They point, for example, to the widely practiced



COLORADO BLUE SPRUCE

Picea pungens, native to the Rockies and often used as a Christmas tree. It is not as commonly used as the Douglas fir (*Pseudotsuga taxifolia*) or the Norway spruce (*Picea Abies*). Photograph reproduced by courtesy of the United States Forestry Service.

characteristically exhibits a tendency for all-out mass production. The same tendency appears to be prevalent with respect to celebration of Christmas in the United States. Although this country, owing to its shorter human history, has not celebrated Christmas nearly as long as have the European countries, nevertheless it has outstripped all the rest of the world not only in the intensity but also in the commercialization attached to this festive time. Truly, Christmas in the United States has become big business.

Origin of the Christmas-Tree Custom

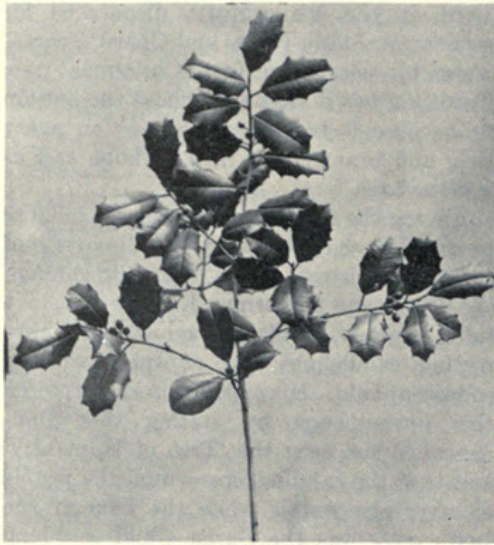
While toys, gifts of all kinds, and greeting cards comprise one element of this holiday expression and receive a great share of attention, the plants commonly associated with Christmas constitute another but equally important phase of the season. The green-and-red color combination is so truly symbolic of Christmas that the one always suggests the other.

Strange as it may seem, the origin of the

100,000 acres in this country are used solely for growing Christmas trees and that seven out of ten occupied dwellings, or some 28 million homes, will be adorned by Christmas trees this year. Where did this custom originate and how?

From the legendary side, it has been pointed out that St. Boniface, English missionary to Germany in the 8th century, approached an oak that had long been the object of pagan worship. After several strokes of his ax, the tree crashed to the earth, but, to the surprise of the onlookers, no harm came to him as he called their attention to a small fir by his feet. This fir, he indicated to them, was to be held as their holy tree. He claimed for it the wood of peace, since their homes were built of it. He said, "It is the sign of an endless life, for its leaves are ever green. See how it points upward to Heaven? Let this be called the tree of the Christ Child—gather about it, not in the wild woods but in your own homes. There it will shelter no deeds of blood [human and animal sacrifices to

custom throughout the ancient world of decorating houses with green boughs—a custom thought to have originated from the worship of trees by the early peoples. There was likewise the custom then of having sacrificial offerings, in the form of first-



AMERICAN HOLLY

Ilex opaca, a native tree of the United States often used in Christmas wreaths. The European holly (*Ilex Aquifolium*) is the holly of legend and is cultivated in the northwestern section of the United States.

harvested crops, hung on certain trees in which, it was believed, dwelt spirits or gods. These ancient pagan peoples also worshipped the sun and held big festivals to honor the sun gods at the time of the winter solstice, the shortest day of the year. This festival was called Yule by the Goths and Saxons.

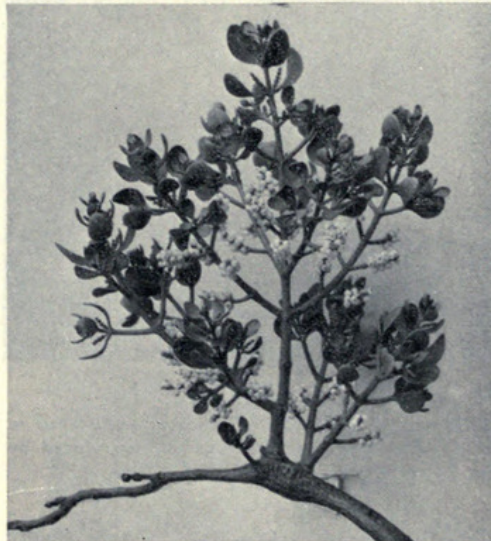
During this same period the early Egyptians hung sprays from palm trees throughout their homes, and Germanic tribes celebrated by bedecking fir trees. Boughs of evergreen and laurel were raised aloft by the Romans during their feasts to Saturn, while the evergreen fir was revered by the Greeks and the Scandinavians at their winter rites. The mistletoe and green boughs in Druid lore symbolized life eternal, and in Norse mythology the evergreens symbolized the revival of Balder, who was the beloved god of the sun.

One story is that the custom of the Christmas tree dated from 1604 at Strasbourg, then in Germany, and was introduced into France and England around 1840 and brought into America in 1847. However, there is evidence that a Christmas tree existed in Philadelphia as early as 1834 and that a spruce was possibly cut at Chicago's old Fort Dearborn during the Christmas celebration there in 1804. There is now evidence, indeed, that in England, as early as 1444, in preparation for the Christmas festivities, the streets, churches, and houses in London were decorated with evergreen.

The fir has often been considered the real Christmas tree. It was reported that in

the Hartz Mountains of Germany the girls danced about a fir tree in religious festivals, singing songs and decorating the tree with lights, flowers, eggs, and gewgaws. As they encircled the tree, they prevented the escape of an imp concealed among the branches, who had to give them whatever he had in his keeping or give up hope of going free. The imp, grown up to become the benevolent St. Nicholas, Santa Claus, or Old Nick, is believed by various students of folklore to be none other than Odin himself, Christianized somewhat out of likeness.

The story has it that when a tree is lighted up on Christmas Eve, one must make sure it is a fir and not a pine, spruce, or hemlock in order to learn one's fate, if one has the courage to look at his shadow on the wall. If the shadow appears without a head, it is supposed to signify that one is to die within the coming year. If a branch is cut off and laid across the foot of the bed, it is supposed to keep away nightmare. A stick of fir, not quite burned through, is reputed to keep away lightning, and a bunch hung at the



AMERICAN MISTLETOE

Phoradendron flavescens, a parasitic flowering plant native of the United States, is commonly used in wreaths and at Christmas parties. It is related to the European or true mistletoe (*Viscum album*) of the legend.

barn door is supposed to keep out evil spirits that want to steal the grain.

Holly and Mistletoe

Interesting too are the legends revolving around two other plants, holly and mistletoe, commonly associated with Christmas. The association of holly and mistletoe with Christmas is believed to be traced back to the time when there was no Christmas and the pagan "festival of the sun," or Yuletide, was celebrated. Yuletide, the turning of the sun in its winter solstice, was celebrated as far back as 2000 B.C. by fire-worshippers of Persia and India. They are known to have venerated the holly and to have used it in their rites. They believed that the

holly tree cast no shadow and that it was highly efficacious to sprinkle the face of a newly born child with water impregnated with the bark of the holly. According to tradition, this was the bush in which Jehovah appeared to Moses.

Writing in the *American Botanist* (Vol. 29, 1923, pp. 157-159), Mary M. French says: "It was in the days of the Druids, however, that we find the holly and mistletoe treated with peculiar veneration and credited with supernatural powers. They attached special significance to mistletoe, particularly when it was discovered growing on an oak tree. When such a growth was found it was gathered by the priests who, ceremoniously clad in robes of white, employed all the rites essential to so solemn an occasion. For the ceremony a golden sickle was used—a sickle which was never used for any other purpose. This highly prized mistletoe was sent to various important families with appropriate Yuletide greetings. The recipients of this token of appreciation were expected to reciprocate with timely and generous contributions.

Used by Ancient Romans

"It is interesting to find that holly was used in the Saturnalia of the Romans which was celebrated in December when the sun began its upward course and corresponded to Yuletide. When the Christians began to celebrate the birthday of Christ it is said that they too used holly in order that they might not appear conspicuous among the Saturnalians. . . .

"Holly has been the subject of much superstition and legend. Pliny says that holly planted about a home serves as a charm and keeps away all ill spells, and also guards against any misdirected bolts of lightning. It was popularly believed in the Middle Ages that witches used holly in the manufacture of their midnight spells and incantations. Berries from holly and



POINSETTIA

Euphorbia pulcherrima. The bright red bracts surrounding the flowers make this one of our showiest Christmas plants, often used as a gift.

juniper and mistletoe were employed to form a witch's chain, each link being finished with an acorn. In those times, and even to this day in some parts of rural England, it was considered unlucky to bring holly into the house before Christmas Eve. It was also considered very unlucky not to have the holly taken down before Candlemas Eve. . . .

Mistletoe and Magic

"Mistletoe was long supposed to have magic power. Certainly the withered spinster who found herself bussed beneath its white berries must have believed devoutly in its magic—a magic rite which has been passed down through the centuries. According to the old Norse legend, it was a spear tipped with mistletoe that was used to kill Balder, the sun god. It had been sworn that nothing 'that springs from fire, air, earth, or water' should hurt this celestial favorite. So the wicked and ingenious Loki, hating this Apollo of the North, made an arrow of mistletoe which he gave to blind Hades to test. The god of darkness shot the arrow and killed Balder. At the urgent pleading of all the gods and goddesses Balder was soon restored to life, and mistletoe was thereafter given into the keeping of the Goddess of Love. . . .

"From such a background of beneficence it was not unnatural later to find mistletoe considered a sovereign remedy for all diseases. It was employed for epilepsy and convulsions. Holly was also believed to have great medicinal powers, although there may be found no authentic record of any remarkable cures it effected."

Kinds of Christmas Plants

In the United States it may be noted that each section of the country has its own favorite Christmas plants, depending upon the species that grow conveniently at hand or that have been shipped in long enough for the people to become accustomed to them. By and large, the conifers, as a class, supply us with most of our Christmas trees, true firs (*Abies*), Douglas fir (*Pseudotsuga*), and spruce (*Picea*) being preferred to all others. Although balsam fir (*Abies balsamea*) at one time led in popularity as a Christmas tree and is especially prized at present in the northeastern states, it has in recent years been supplanted in various sections of the country by Douglas fir (*Pseudotsuga taxifolia*), a relative newcomer to the scene.

Douglas fir is native to the forests of the Pacific Coast and Rocky Mountain region. One of the most important centers of Christmas tree production and of Douglas firs in the United States is Eureka, Montana, located in the Rockies. It is reported that 155 freight carloads of Douglas firs were shipped from this center in 1948. Both the true firs and Douglas fir can be readily distinguished from the spruces by their

stalkless needlelike leaves, whereas the spruces have leaves provided with stalks.

There are many kinds of firs and spruces. About 40 different species of true firs (*Abies*) are known. They range through temperate regions of the northern hemisphere reaching south into Guatemala, North Africa, and the Himalayas. At least two species, the balsam fir (*A. balsamea*) and the silver fir (*A. concolor*), are commonly used in this country for Christmas trees, the former more plentifully. Of the spruces, about 40 species are likewise known as inhabitants of the countries of the northern hemisphere. They make excellent Christmas trees because their stiffer, densely leafy twigs are easier to



BALSAM FIR

Abies balsamea, the most highly prized Christmas tree of the northeastern United States and one of the most popular of all the Christmas trees. It is very similar to the European or silver fir (*Abies alba*), the fir of European Christmas-tree legends.

trim than those of the softer balsam fir and their symmetrical horizontal whorled branches form a beautiful pyramidal shape. They do shed their leaves sooner than the firs, however, because their stalked leaves separate from the stalks, but generally they retain their leaves long enough to last over most of the holidays.

Some of the spruces most commonly used at Christmas in this country include the

Norway spruce (*Picea Abies*), a native of Europe but commonly planted in this country, white spruce (*P. glauca*), native of the northern United States, Colorado blue spruce (*P. pungens*), native of the Rocky Mountains, and red spruce (*P. rubens*), native of the eastern United States. Although five species of the Douglas fir group (*Pseudotsuga*) are known, only one (*P. taxifolia*) is native to North America, being found in the West, while the other four species inhabit eastern Asia.

Other conifers are often used as Christmas trees in the United States.

Plants other than conifers are sometimes used as Christmas trees in this country. In the southwestern states, for example, some of the huge treelike cacti near dwellings are decorated and lighted up. In New Orleans it is customary to hang lights on the branches of the hackberry or sugartree.

Besides the varieties of trees mentioned above commonly used as Christmas trees, many other plants in this country play an important role in decoration for the Christmas festivities—for sprays, wreaths, bouquets, and mantle or table decorations. In addition to holly and mistletoe, which are the most popular in this country, plants on the following list are widely used in the United States, each section commonly using the material most abundant or indigenous to that particular area. Of evergreen types of leaves a partial list includes ground pine (species of *Lycopodium*), ground hemlock or yew (*Taxus canadensis*), often used as a strong backing for large wreaths, juniper (*Juniperus virginiana*) for smaller wreaths, hemlock (*Tsuga canadensis*), its fine feathery needles and small cones being especially suited for use in sprays, laurel or sweet bay (*Laurus nobilis*), and Christmas fern (*Polystichum acrostichoides*).

Plants Used in Other Countries

Since the Christmas tree ceremony and customs of decoration connected with the festivities are largely associated with European tradition, we find that European countries and those influenced by European or Christian legends have their particular Christmas tree plants that they hold in great esteem and sanctity. In Europe the silver or European fir (*Abies alba*), of Christmas tree legend and the species that has been used for centuries in Europe as the Christmas tree, is the one most commonly decorated. It has many characteristics in common with our balsam fir, a fact that may have helped develop the high regard in this country for the balsam fir and to rate that species as the foremost Christmas tree of the northeastern United States. Europe does not possess Douglas fir (*Pseudotsuga*) but does have a number of species of spruce, of which the Norway spruce (*Picea Abies*) is the best known and most frequently used. The holly, of course, is

(Continued on page 12, column 1)

HOVEY MUSEUM FOSSILS RECEIVED HERE

The Museum recently purchased the major part of the fossil collections of the Hovey Museum of Wabash College, Crawfordsville, Indiana. The specimens are now being unpacked, accessioned, and added to the study collection of the Department of Geology. Among a small number of vertebrate fossils is the type specimen of a primitive American camel, *Procamelus hesternus* (Leidy). Invertebrate fossils constitute most of the collection, including many fine specimens of Mississippian crinoids from Crawfordsville, a classic locality from which complete specimens were taken in great abundance two generations ago. There are few places where one may collect complete fossil crinoids, as these strange animals almost invariably disintegrate into millions of tiny pieces of crystalline calcite upon death unless buried rapidly in perfectly still water. The classic localities such as Crawfordsville are now almost entirely "worked out," so that it is a rare stroke of fortune to come upon a quantity of pristine specimens from such a place now.

The Hovey Museum was named for Edmund Otis Hovey, one of the founders of Wabash College, where he taught the courses in natural science. It was he who discovered the famous crinoid beds of Crawfordsville and presumably collected most of the fine crinoid specimens included in the collection. His grandson, with the same name, became a distinguished paleontologist and curator of geology at the American Museum of Natural History, New York, but had no recorded connection with the Hovey Museum. Both grandfather and grandson were original fellows of the Geological Society of America.

For the second time, the Department of Geology is assimilating the fossils of a small Indiana museum. In 1923, Mrs. George W. Robb presented the collections of the Borden Museum, of Borden, Indiana. The Borden collection, even larger than the Hovey collection, also includes many fine crinoids from Crawfordsville.

Before 1883, the Hovey Museum occupied a wing of Center Hall on the campus of Wabash College. It achieved a period of glory between 1883 and 1890 when it was located in the old college gymnasium. With the return of the gymnasium building to athletic activities in 1890, the specimens were scattered among classrooms and laboratories, and when geology was dropped from the curriculum in 1916, little use remained for the collection. In the study collection at Chicago Natural History Museum these fossils will henceforth be available for any scholar to examine and will facilitate the work of the Department of Geology in making determinations of fossils submitted for identification.

It is desired to express the appreciation

of the Museum to Dr. Frank Sparks, President of Wabash College, and to Dr. Eliot Williams of that college's Department of Zoology, for their action in making available to the Museum and to research scientists for all time to come the splendid specimens comprising the Hovey collection.

EUGENE S. RICHARDSON, JR.
Curator of Fossil Invertebrates

DECEMBER LECTURE TOURS, DAILY EXCEPT SUNDAY

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays. A schedule of these follows:

Fri., Dec. 1—Natural History of the Chicago Area. Illustrated introduction in Meeting Room (*Lorain Farmer*).

Wed., Dec. 6—Designs in Wood—Tree Growths that Result in Beautiful Patterns (*Miriam Wood*).

Fri., Dec. 8—The Earth Blows Her Top—Story of Volcanoes. Illustrated introduction in Meeting Room (*Anne Stromquist*).

Wed., Dec. 13—Sacred Animals (*Jane Sharpe*).

Fri., Dec. 15—Trademarks of Culture. Illustrated introduction in Meeting Room (*June Buchwald*).

Wed., Dec. 20—Earth's Natural Resources (*Anne Stromquist*).

Fri., Dec. 22—Toys. Illustrated introduction in Meeting Room (*Harriet Smith*).

Wed., Dec. 27—Web of Life—Interdependence of Plants and Animals (*Marie Svoboda*).

Fri., Dec. 29—Your Winter Vacation in Cuba—Natural History. Illustrated introduction in Meeting Room (*Jane Sharpe*).

Persons wishing to participate should apply at North Entrance. Tours are free. The Museum will be closed on Christmas and New Year's Day.

4-H Club Youths Throng Museum

Boys and girls from the farms of America, chosen in each state for excellence of achievement and sent to Chicago at the time of the International Livestock Exposition as delegates to the National Congress of 4-H Clubs, made their annual visit to Chicago Natural History Museum on November 27 and 30. Several hundred teen-agers and younger members of the rural organization came to the Museum on each day. Special programs were presented for them in the James Simpson Theatre by the Raymond Foundation, after which they made tours of the exhibition halls.

EXPEDITION TO MARIANAS COMPLETES WORK

Dr. Alexander Spoehr, Curator of Oceanic Ethnology, has just returned to the Museum after completion of the Museum's 1949-50 Anthropological Expedition to the Marianas Islands. Except for Guam, the Marianas Islands formerly were a part of the Japanese mandate. Today they are administered by the United States as a United Nations trust territory. The purpose of the Museum expedition was twofold: (1) an archaeological project, designed to uncover the ancient history of the Marianas before Magellan's discovery of Guam in 1521, and (2) an ethnological project whose purpose was the study of the modern native communities on the islands north of Guam. During the war, the Chamorros (the name of the local inhabitants) lost all their possessions and their lives were completely disrupted. Today, under American administration, they are attempting to construct new communities. A principal purpose of the expedition was to examine the process of the reformation of community life and to assess the nature of the problems that remain to be solved by these people. The project was conducted in co-operation with the Navy Department, which at present administers the trust territory. During the year's work of the expedition, headquarters were maintained at Saipan.

A comprehensive account by Dr. Spoehr of the results of the expedition will be printed in an early issue of the BULLETIN.

STAFF NOTES

Dr. Sharat K. Roy, Chief Curator of Geology, Robert K. Wyant, Curator of Economic Geology, Bryan Patterson, Curator of Fossil Mammals, and Robert H. Denison, Curator of Fossil Fishes, attended the Geological Society of America meetings held in Washington, D.C., November 16, 17, and 18. Dr. Roy is continuing his studies on meteorites at both the United States Geological Survey and the U. S. National Museum in Washington . . . Dr. Paul S. Martin, Chief Curator of Anthropology, will present a paper at the annual meeting of the American Anthropological Association in Berkeley, California, in the latter part of December . . . Miss Elaine Bluhm, of the Department of Anthropology, lectured on American Indian pottery November 21 at a meeting of the Chicago Potters Guild . . . Robert Kanazawa, Assistant in Fishes, has resigned to take a position at the U. S. National Museum in Washington, D.C. . . . Loren P. Woods, Curator of Fishes, and associates in his Division have been making a series of field trips to study cave fishes. Localities thus far visited include southern Indiana, central Kentucky, and Tennessee.

'OLD IRON' FOR TREASURED FURS: INDIAN TRADE IN 1700's

BY GEORGE I. QUIMBY

CURATOR OF EXHIBITS, ANTHROPOLOGY

THE SEA OTTER, though probably ignorant of it, was of great importance to the United States, England, China, and the Indian tribes of the Northwest Coast

iron, a forge, and an expert smith, with a journeyman and apprentice, who might be ready to forge such tools, as it should appear the Indians were most desirous of. For though six of the finest skins purchased by us, were got for a dozen large green glass

Captain Cook, there is the following statement (Book VII):

"Nothing would go down with our visitors but metal; and brass had by this time, supplanted iron, being so eagerly sought after, that before we left this place, hardly a bit of it was left in the ships, except what belonged to our necessary instruments. Whole suits of clothes were stripped of every button; bureaus of their furniture; and copper kettles, tin cannisters, candlesticks, and the like, all went to wreck; so that our American friends got a greater medley and variety of things from us, than any other nation whom we had visited in the course of the voyage."

RESORTED TO STEALING

It is obvious from the above accounts that the Indians' desire for metals made iron, brass, copper, and tin an ideal medium of exchange in the fur trade. But when the trading was slack or furs were wanting or perhaps for some other reasons, the Indians helped themselves to metal. This aspect of Northwest Coast Indian behavior is documented by the following complaints of Captain Cook (Book VII):

"However, their eagerness to possess iron and brass, and, indeed, any kind of metal, was so great that few of them could resist the temptation to steal it whenever opportunity offered.

"They were thieves in the strictest sense of the word, for they pilfered nothing from us, but what they knew could be converted to the purposes of private utility, and had a real value according to their estimation of things. And it was lucky for us that nothing was thought valuable by them, but the single articles of our metals. Linen and such like things, were perfectly secure from their depredations; and we could safely leave them hanging out ashore all night, without watching.

"We soon discovered by this nearer intercourse, that they were as light-fingered as any of our friends in the islands we had visited in the course of the voyage. And they were far more dangerous thieves; for, possessing sharp iron instruments, they could cut a hook from a tackle, or any other piece of iron from a rope, the instant our backs were turned. A large hook weighing between twenty and thirty pounds, several smaller ones, and other articles of iron were lost in this manner. And as to our boats, they stripped them of every bit of iron that was worth carrying away, though we had always left men in them as a guard. . . . One would contrive to amuse the boat-keeper, at one end of the boat, while another was pulling out the iron work on the other."

THE CHIEF'S 'BARGAIN'

The value of metal to the Indians is shown not only by the fact that they stole it or



NORTHWEST COAST LANDING, 1778

One of Captain Cook's boats at a Northwest Coast Indian village. Cook complained that the Indians took the ironwork off his boats. (From illustration in 1784 edition of Cook's "Voyages.")

of America (southern Alaska, British Columbia, and Washington). The sea otter was the means by which the English and Americans obtained tea and silk, the means by which the Chinese mandarins obtained fur robes, and the means by which the Northwest Coast Indians obtained iron, brass, copper, tin, civilization, and eventual cultural extinction. For in the last quarter of the 18th century Great Britain and especially the United States were in need of something that could be exchanged for tea and silk in China.

In 1784 the problem was solved by the publication of the account of Captain James Cook's third voyage, in which he showed that there was a Chinese market for sea-otter skins from the Northwest Coast of America. The only remaining problem was how to obtain the sea-otter skins from the Indians of the Northwest Coast. And Cook's publication solved this problem, too. The Northwest Coast Indians would trade anything in exchange for metal, principally iron, brass, and copper.

URGED SHIPBOARD FORGES

The following recommendation to prospective merchants and captains is contained in Cook's *Voyages* (1784, Book IV):

"I would, by all means, recommend, that each ship should have five ton of unwrought

beads, yet it is well known that the fancy of these people for articles of adornment, is exceedingly capricious; and that iron is the only sure commodity for their markets."

When Captain Cook was exploring the waters of the Northwest Coast and trading with the Indians in 1778 he recorded that the Indians "were more desirous of iron, than any other of our articles of commerce, appearing to be perfectly acquainted with the use of metal" (Cook, 1784, Book VII). Cook goes on to say: "For the various articles which they brought, they took in exchange knives, chissels, pieces of iron and tin, nails, looking glasses, buttons, or any kind of metal. Glass beads they were not fond of, and cloth of every sort they rejected."

FOND OF MIRRORS

The Boston ship *Columbia* attempted in 1788 to trade snuff bottles, rat traps, Jew's-harps, and pocket mirrors for sea-otter pelts. Of this trade cargo, however, the Indians would accept only pocket mirrors. The *Columbia's* trade inventory on her second voyage in 1790 contained 143 sheets of copper, 4,261 quarter-pound iron "chissels," 12 gross metal buttons, a large quantity of nails, and 100-odd muskets and blunderbusses (Morrison, 1925).

Returning once more to the journals of

were willing to trade for it but also by what was traded for metal. Captain John Meares of the trading ship *Felice Adventurer* reported, "Sometime in October, 1788, his Majesty [an Indian chief] brought us a young woman and offered her for sale; and she was accordingly bought for an axe and a small quantity of glass beads. . . . She remained with us near four months."

The Boston ship *Columbia* obtained in 1790 from the Haida Indians 200 sea-otter skins for 200 iron chisels, but the Nootka Indians, who had had more experience with traders, demanded ten iron chisels or a sheet of copper six inches square for one sea-otter skin. The armorer on Captain Joseph Ingraham's brigantine *Hope* made ornamental collars and bracelets, each of which was worth three sea-otter skins. Sea-otter skins bought goods in China to the value of \$50 each. Thus the trading on the Northwest Coast was very lucrative for everybody concerned.

HOW METAL WAS USED

It has just been shown that the Northwest Coast Indians wanted metal and that American and English traders supplied it in quantity. Here are some examples of the ways in which the Indians used the metals:

Axes and chisels of iron were hafted to wooden or bone handles and used as cutting or planing adzes. The Northwest Coast Indians did not use axes of stone before the arrival of the traders, but had used stone adzes; and thus they even hafted axe blades for use as adzes. Iron knives and arrow heads were used in place of the older stone and bone types. Iron muskets and blunderbusses in part replaced bows and arrows.

A number of uses of metal were ceremonial, ornamental, or symbolic of prestige. For instance, Captain Cook records that he saw an Indian wearing two Spanish spoons of silver around his neck. Another example of the use of ornaments is Captain Ingraham's iron collars and bracelets that became so popular. Captain Meares' account of the arrival of Comekela, a Nootka Indian, at Nootka Sound after a passage from China on Meares' ship provides an excellent example of the use of metals for purposes of ornament and prestige:

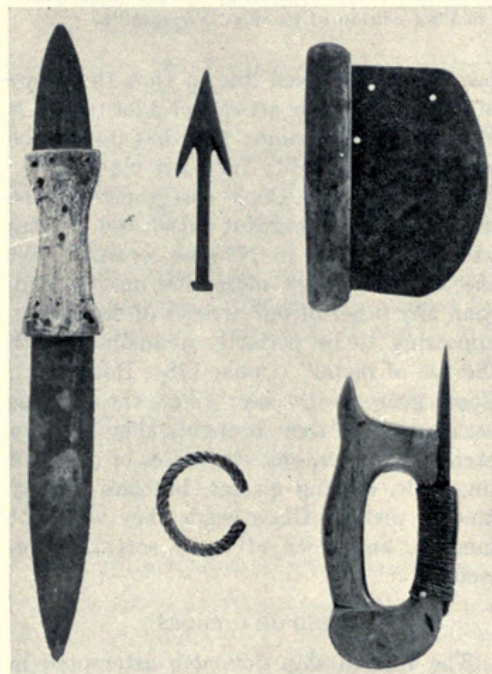
"His scarlet (regimental) coat was decorated with such quantities of brass buttons and copper additions of one kind or other, as could not fail of procuring him the most profound respect of his countrymen, and render him an object of the first desire among the Nootka damsels. At least half a sheet of copper formed his breastplate; from his ears copper ornaments were suspended, and he contrived to hang from his hair, which was dressed en queue, so many handles of copper saucepans, that his head was kept back by the weight of them, in such a stiff and upright position, as very

much to heighten the singularity of his appearance. For various articles of his present pride Comekela had been in a state of continual hostility with the cook, from whom he had contrived to purloin them, but their last and principal struggle was for an enormous spit, which the American had seized as a spear, to swell the circumstances of the Magnificence with which he was on the moment of dazzling the eyes of his countrymen;—and situated as we were, this important article of culinary service could not be denied him. In such a state of accoutrement, and feeling as much delight as ever fed the pride of the most splendid thrones of Europe or the East, we set out with him for the shore, when a general shout and cry from the village assured him of the universal joy which was felt on his return.

"The whole body of inhabitants moved towards the beach, and with a most unpleasant howl, welcomed him on shore. . . . After the first ceremonies of welcome were over the whole company proceeded to the king's house, into which persons of rank were alone permitted to enter, and where a magnificent feast of whale blubber and oil was prepared."

NECKLACES OF KEYS

Other objects used for ornament and prestige were copper teakettles that were never used and bunches of old polished keys



INDIAN METAL CRAFTSMANSHIP

Tools, weapons, and ornaments showing what the Northwest Coast Indians did with iron and copper obtained by trade.

worn as necklaces (Morrison). Captain Cook wrote that one of the chiefs was presented with a "new broad-sword with a brass hilt," probably for use as an ornament.

Metal was even used in place of a carved ceremonial mask, for, according to Cook

(Book VII), "So fond are they of these disguises that I have seen one of them put his head into a tin kettle he had got from us, for want of another sort of mask."

Another example of the use of a metal object for ceremonial purposes is cited by Meares, who reported in 1788 that Maquilla, a Nootka chief, had "a brass mortar, left by Captain Cook which was held in the highest degree of estimation by the Nootka chief. This piece of culinary furniture was elevated from a state of servile use, to become a symbol of royal magnificence. It was kept extremely bright, and, in visits, or meetings of ceremony, it was borne before Maquilla, to aid the splendor of the regal character."

The Northwest Coast Indians seem to have had a desire for metals that transcended mere recognition of utility and superiority over stone, bone, and shell. In fact, their desire for metal seems compulsive to the point of being unreasonable. The Indian desire for metal is, however, understandable in the context of their cultural pattern, which emphasized symbolic wealth, class prestige based on wealth and birth, warfare, and skill in woodcarving.

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FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

Publications.—During 1900 ten publications were issued and also the second part of Professor Charles B. Cory's *The Birds of Eastern North America*. The total number of pages published amounted to 547.

In comparison, the Annual Report for 1949 states that twenty-two titles were published in the Scientific Series and one in the Administrative Series. The total number of pages printed in all books, including an index for one completed volume in the Scientific Series, was 2,694.

Accessions. "The purchase of the Patterson herbarium containing 30,000 specimens of North American plants was a most noteworthy contribution to the Department of Botany." *This was the third major collection obtained by the Museum, the first being the Schott Collection of 8,500 specimens, the second the Bebb Collection of 30,000 plants.*

BORNEO EXPEDITION BACK—

(Continued from page 3)

people imagine the jungle as crawling with snakes, but we encountered scarcely a dozen even though we were looking for them. The forest is not an impenetrable tangle through which a path must be hacked with knife or ax. On the contrary the shade of the giant trees is so dense that few plants can grow beneath them and the forest is open and almost parklike. The aborigines, sometimes described as blood-thirsty head-hunters, we found to be amiable companions, trustworthy and capable. The only survival of the head-hunter's art that we saw was a gift of a gibbon skull, flower-bedecked and decorated exactly like the human skulls that once were prized, and gruesomely reminiscent of that vanished custom.

But the Museum—and science in general—is not interested in things merely because they are bizarre or rare. A two-headed calf is likely to be less useful to a biologist than one with the customary single head; and a frog from Borneo is not necessarily more interesting than one from Chicago. Biological research in the tropics is rewarding chiefly because under lush tropical conditions many of the life processes biologists are trying to understand are intensified so that things that might be inconspicuous elsewhere are often exaggerated and relatively obvious there.

EVOLUTIONARY BY-PATHS

Perhaps the most important biological problem today is the incredibly intricate mechanism of evolution—how the changes that we know have taken place during the history of animal life were actually brought about. Some aspects of this wonderfully complex problem can be studied only in the tropics, just as other aspects can be studied only in a well-equipped laboratory or by digging fossils from the ground. Biological research in the tropics, like scientific research anywhere, is mostly an uninspiring routine of accumulating facts, with only occasional flashes of thrilling discovery. For every minute of excitement there are hours of taking temperature and humidity readings, checking rain gauges, rearing tadpoles, dissecting out stomachs, endless skinning, or just plain slogging through the steamy forest. For the mere adventurer the rewards are scant and soon exhausted.

The expedition collected more than 350 mammals, by far the largest collection of North Bornean mammals in existence, nearly 500 birds, several hundred reptiles and amphibians, and several thousand fishes, insects, and other invertebrates. More than 100 skeletons and numerous anatomical preparations were made. Many parasites, which are important in transmitting tropical diseases, were collected and preserved. The expedition made about 500 photographs, 200 of them in color, and 600 feet of motion picture film.

It is a pleasure to acknowledge the Museum's indebtedness to various organizations in Sandakan for their whole-hearted co-operation with the Borneo Zoological Expedition. The Forestry Department, the Fisheries Department, and North Borneo Timbers, Ltd., were constantly helpful, and without their assistance the expedition would have been far less effective.

COMMENTS OF DARWIN ON USE OF WORDS

I have read your paper with much interest. You ask for remarks on the matter, which is alone really important. Shall you think me impertinent (I am sure I do not mean to be so) if I hazard a remark on the style, which is of more importance than some think? In my opinion (whether or not worth much), your paper would have been much better if written more simply and less elaborated—more like your letters. It is a golden rule always to use, if possible, a short old Saxon word. Such a sentence as "so purely dependent is the incipient plant on the specific morphological tendency" does not sound to my ears like good mother-English—it wants translating. Here and there you might, I think, have condensed some sentences. I go on the plan of thinking every single word which can be omitted without actual loss of sense as a decided gain. Now perhaps you will think me a meddling intruder: anyhow, it is the advice of an old hackneyed writer who sincerely wishes you well.

CHARLES DARWIN, Letter to John Scott,
Dec. 11, 1862, *More Letters of Charles Darwin*

'CAVEMAN SCANDAL' BARED BY LAYMAN LECTURER

"The Caveman Knew His Way Around" is the title of the second lecture in the new series of programs on Sunday afternoons by Paul G. Dallwig, the Layman Lecturer. This subject will be presented on four Sundays of this month (December 3, 10, 17, and 31—because of Christmas Eve there will be no lecture on Sunday, December 24).

In this lecture Mr. Dallwig presents the story of our caveman ancestors. He will describe their physical and cultural development, with special attention to prehistoric art. The lecture will be illustrated with the life-size dioramas in the Hall of the Stone Age of the Old World—the Neanderthal family, Cro-Magnons, Sun-Worshippers, and others. Mr. Dallwig's dramatizations of his subjects, which have made his lectures so popular, will in this instance include the story of a prehistoric murder as it may have occurred, the result, perhaps, of jealousy. The victim was a "beautiful" young Magdalenian woman of about 20,000 years ago whose skeleton is on exhibition in the Museum.

The lecture will begin at 2 P.M. and end at 4:30 P.M. Midway there will be an intermission for tea and other refreshments in the Museum Cafeteria. In January Mr. Dallwig's subject will be "Living Races and Their Way of Life."

Members of the Museum may use their membership cards to attend these lectures without advance reservations. All others, except out-of-town visitors and representatives of the press, must make advance reservations to attend the Sunday lectures. Reservations may be made by mail or telephone (WAbash 2-9410). The lectures are free.

CHRISTMAS SHOPPING MADE EASY: YOU NEEDN'T STIR FROM YOUR HOME

There are two easy ways to do your Christmas shopping with the help of Chicago Natural History Museum. Both not only eliminate the struggle with holiday crowds in store aisles but also save you the trouble of wrapping and mailing parcels. Here they are:

(1) Christmas Gift Memberships

Send to the Director the name and address of the person to whom you wish to give a Museum membership, together with your remittance to cover membership fee or dues.

An attractive Christmas card will notify the recipient that through your generosity he has been elected a Member of the Museum. He will receive also his membership card or certificate and information on membership privileges.

(2) Museum Book Shop Gifts

Books endorsed for scientific authenticity by members of the Museum staff are on sale in the BOOK SHOP. The selection is for both adults and children.

Where desired, the BOOK SHOP will handle orders by mail and telephone (WAbash 2-9410) and will undertake all details of wrapping and dispatching gift purchases to the designated recipients, together with such personal greetings as the purchaser may specify.



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