News of Science

Abominable Snowman

During recent years, stories have been coming out of India and Tibet about a giant mammal that lives above the snow line. According to some accounts, this creature is more than 7 feet in height, walks erect, has an apelike head and face, and is covered with heavy blond or reddish hair. The name "Abominable Snowman" has been given to the animal; the implication, of course, is that it is some sort of giant primate.

Huge footprints in the snow, at heights of from 10,000 to 21,000 feet above sea level, and attributed to the "snowman," have been reported by a variety of people, including members of various Himalayan expeditions. From the latter source have come actual photographs of the footprints, which could pass for those of a large primate. Indeed, it has even been suggested—perhaps with more levity than seriousness—that the "snowman" may be no other than the giant ape, *Gigantopithecus blacki,* persisting as a relic of the Pleistocene epoch in the seclusion of the Himalayas. This, of course, is at best no more than sheer speculation. As a matter of fact, *Gigantopithecus* itself is of decidedly uncertain status, being founded on three molar teeth, probably of Middle or Upper Pleistocene age, recovered from a Chinese drugstore in Hong Kong.

In connection with the matter of identification, it must be emphasized that there is no record of any "snowman" ever having been captured—either alive or dead—or even photographed. Identification rests solely upon the footprints and verbal evidence. It must be admitted that the footprints do bear some resemblance to those of a primate; on the other hand, they could as well be those of a bear. This alternative is not as strange as it may seem offhand, for the general superficial resemblance of ursine and primate feet has long been recognized by naturalists and comparative anatomists.

Wood Jones [*Hallmarks of Mankind* (1948)] points out that the animal footprint most commonly mistaken for that of man is that of the bear; in this connection, he notes that the footprint of the mysterious "orang pendek," once believed by both natives and Europeans to be that of some small jungle race of men, finally was proved to be the footprint of the Malayan bear. Futhermore, many bears readily stand erect and even indulge in bipedal locomotion on occasion. Consequently, the identification of the "abominable snowman" as a bipedal primate has been vigorously rejected by many zoologists and anthropologists. To most of them, a large bear seems a more acceptable and more plausible explanation.

The question of the nature of the "abominable snowman" has been investigated by the Rev. Swami Pranavananda [*Indian Geographical J.* **30**, 99 (July–Sept. 1955)], who concludes that the animal is no other than the red bear of the Himalayas. According to the author, the "snowman" is known to Tibetans as *mi-te,* meaning "man-bear." There are three varieties of bear in this region: black, brown, and red. The last of these is the *mi-te,* which is known to walk on its hindlegs like a man. The author reports several accounts of the *mi-te* gathered from Tibetan eyewitnesses.

A shepherd from eastern Tibet, whose sheep had been attacked by the animal at a height of 16,000 feet along the Kyang Chu, a tributary of the Brahmaputra, stated that the *mi-te,* after first running on all fours, rose on its hindlegs and departed following ineffectual gunfire from the shepherds; it was described as of about the height of a man and light red or reddish brown in color. A number of pilgrim nomads from northern Tibet identified the *mi-te* as the red bear and reported having encountered it at a height of 17,000 feet in the source region of the Kubi, a headstream of the Brahmaputra.

According to another informant, a *mi-te* was seen by shepherds near Tomomopo, on the Tag Tsangpo, on the southeastern side of Manasarovar, at a height of 15,000 feet. At times it moved on all four legs; at others, on its hindlegs alone. When erect, its height was a little greater than that of a tall man. The body was covered by a thick coat of reddish-brown hair. The footprints, left on hard ground scantily covered by sand, measured 11 inches in length and 5 inches in breadth. Although the imprints of the hind feet had five toes, those of the front feet exhibited only four toes. The toes in general were of about equal length, approximately 1½ inches; the little toes, however, were slightly shorter.

Ten days later, when the shepherds had gone up the valley to graze their sheep, they encountered footprints of the *mi-te* in the snow. These prints were considerably larger than those left in the sand, measuring 18 inches in length with a corresponding increase in breadth; furthermore, no traces of the toes remained. This was obviously due to melting of the snow at the edges of the imprint after long exposure to the sun, with consequent enlargement of the entire impression.

Pranavananda notes that footprints in the snow are subject to change in dimensions, deformation, and obliteration of details (such as impressions of toes), not only through the action of the sun, but also as a result of blizzards or strong winds. When crossing Khandosanglam Pass in 1941, he came across giant footprints. Khandosanglam is a pass east of Kailas, a holy peak; according to Tibetan tradition it can be negotiated only by those pious pilgrims who have completed 12 circumambulations of Kailas by the regular parakrama route. Hence perhaps one or two pilgrims negotiate this pass in a year. It was ascertained that a lama had crossed the pass some 25 days earlier. His were the footprints encountered by the author. As a result of the warm July sun, the deep snow along their edges had melted away, producing a trail of greatly enlarged prints that were 21 inches long and correspondingly increased in width.

It is not difficult to see, as the author points out, how a superstitious pilgrim might have readily described such footprints as those of a great 1000-year-old Himalayan Yogi or as those of Hanuman or some other legendary character; indeed, they might well have been described by some Himalayan expedition as the footprints of an "abominable snowman" or even by a credulous anthropologist as those of a prehistoric man. Nor is there any reason why the snow footprints of the red Himalayan bear might not suffer similar misinterpretation.

According to Pranavananda, the red bear is not the only mammal that frequently makes excursions far onto the snow fields and glaciers, apparently chiefly in search of food. The wild yak, Tibetan wild horse, lynx, snow leopard, wolf, ibex, bharal, ghural, Tibetan antelope, musk-deer, and other animals do likewise, for vegetation can occur up to an altitude of 20,000 feet or more. Their footprints also can be so altered by sun, blizzard, and wind as to be capable of being misinterpreted. The author believes that the footprints reported by Eric Shipton as attaining the size of those

of a young elephant were those of a lynx, snow leopard, or wolf magnified by melting of the snow at their edges.

Some people, while not accepting the "snowman" footprints as those of a giant bipedal primate, have nevertheless regarded them as primate in origin and have attributed them to the langur or black-faced Himalayan monkey. Pranavananda, however, rejects this interpretation, since the langur is seldom or never seen above the tree line and, hence, does not wander on the snow. Moreover, he says, langurs in the upper Himalayas move down to lower, warmer regions well in advance of the snowfall.

Another probable factor in the creation of the "abominable snowman" legend is a linguistic one. The author notes that different persons have translated differently—and sometimes grossly mistranslated—the original local Tibetan words designating the animal that has been identified as the "abominable snowman." In this connection, it is to be noted that most of the current "snowman" stories come from India rather than from Tibet itself. It appears likely that mistranslation of local Tibetan words by foreigners has been responsible for some misconception.

The fact that the matter has not been thoroughly investigated on the Tibetan side of the Himalayas—where the local population has a correct knowledge of the identity of the animal—has helped perpetuate the wrong conception of the animal, according to Pranavananda's view. *Mi-te,* which has been translated by some Himalayan expeditionists as "abominable, filthy, disgusting to a repulsive degree, dirty," actually means "man-bear." *Kangmi,* or "snowman," is merely an alternate word for the same animal. Hence the term *miteh-kangmi,* from whence "abominable snowman," represents an incorrect combination, owing to mistranslation, of two terms that are essentially synonymous.

Thus the "abominable snowman" would seem, on the basis of the best evidence now available, to be no other than the Himalayan red bear. The matter, of course, cannot be conclusively settled until a specimen of undoubted "snowman" is secured for study.

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New Fossil Plants

Roland W. Brown of the U.S. Geological Survey has described several previously unknown species of fossil plants that he found among specimens recently acquired by the U.S. National Museum. In a report on "Paleobotany—new items in Cretaceous and Tertiary floras of the western United States" that appeared in a recent issue of the *Journal of the Washington Academy of Science,* Brown states that while some of these new additions to the museum come from localities and formations already known, others are from strata not yet named. Therefore, they will contribute toward the dating of the strata as well as to a clearer concept of the species the plants represent. Rather than postpone their description to an uncertain time when monographs can be published, it was decided to present the essential facts immediately.

The newly described species include two ferns, two legumes, and others. Of special interest is a small leaflet that has been identified as "the first unequivocal fossil foliage of *Ailanthus.*" Hitherto, Brown points out, the assignment of leaflets to the same species as well-recognized seeds from identical localities, has left much to be desired. None of the leaflets so assigned has clearly shown the characteristic basal, glandular teeth.

In the museum's newly described specimen, however, all the features are comparable with those seen in modern, living *Ailanthus,* especially the glandular tooth. This means that the *Ailanthus* has known ancestors as far back as the mid-Eocene period of geologic history, with evidence now based on leaf structure as well as on fruit. Brown named his find *Ailanthus eureka.*

Great Bahama Bank

The first members of a team of nine research workers and their assistants left New York recently to continue work on a geologic and ecologic survey in the West Indies that may throw new light on the relationships between present-day communities of living organisms and those that existed thousands of years ago. The expedition, which is led by Norman D. Newell, curator of historical geology at the American Museum of Natural History, will make use of such techniques of investigation as skin diving and underwater and aerial photography in an attempt to bring back evidence of the history of life to be found in the waters of the Great Bahama Bank.

The Bank is a limestone platform of some tens of thousands of square miles, almost entirely covered by shallow seas, that is southeast of Florida. Portions of the platform rim projecting above the water constitute several of the Bahama islands. This region is of special interest to geologists because it is one of the few examples of a shallow limestone sea such as those that long ago covered North America.

The expedition is the second in a 3-year project. The study includes comparisons of living plants and animals with their fossil counterparts, which are found in abundance petrified in the rocks of Bimini. This comparison will be a test of the limitations of fossil sea animals in general as indicators of past environmental conditions.

The expedition will remain in the field for 6 weeks. Base of operations will be the Lerner Marine Laboratory. The American Museum's field station on North Bimini Island.

Peat as a Binder

Edgar L. Piret, professor of chemical engineering at the University of Minnesota, has reported that a research team working under the sponsorship of the state's Iron Range Resources and Rehabilitation Commission has found that ground peat reinforced with an alkali solution is an excellent binder for the balling or pelletizing of powdered taconite concentrate. As it is mined, taconite contains only about 25 percent iron. Since this iron content is too low for direct feed of the rock to the blast furnaces, the ore must be concentrated. This is accomplished by grinding taconite into tiny particles and then separating the magnetic iron from the mother rock in magnetic separators.

The resulting purified ore contains about 62 percent iron but is much too fine for the blast furnace. To obtain a suitably loose packing that will allow the furnace blast to pass through the ore during the smelting operation, it is necessary to form the powdered ore into ½- to ¾-inch pellets in a balling drum. The pellets then are baked or sintered in a furnace to strengthen them so that they will withstand handling, shipping, and feeding into the blast furnace.

Scientists in the News

JOHN A. BEHNKE, associate administrative secretary of the AAAS, will resign on 30 June to accept a position as vice president and science editor of the Ronald Press Company, New York.

WALTER H. ZINN, director of Argonne National Laboratory, has been presented with a special commendation by the U.S. Atomic Energy Commission. The presentation was made at a luncheon given in honor of the recipient by the University of Chicago. The citation read:

"In recognition of his achievements as scientist and administrator in the U.S. Atomic Energy Commission program beginning with essential contributions to the production of the world's first self sustaining chain reaction on December 2, 1942 and continuing during 10 years of