

ANTHROPOLOGY

Man's Tree—A New Root?

With Darwin's theory of evolution generally accepted, controversy over the origin of man has shifted to the specifics of how he evolved and what his ancestors looked like.

By CHARLES A. BETTS

► IN THE CENTURY since Darwin, man's search for knowledge about his origin has uncovered new facts and given new depth to the fascinating, controversial theory of evolution.

In Darwin's day, the fight was church-science oriented over whether man had indeed evolved from lower forms of life or had been created, along with other life, by a divine will.

Now, few question the validity of Darwin's theory. Instead the fight is among scientists over just how man did evolve, when he did so and what he looked like.

Specifically at issue now is the meaning of the discoveries by Dr. Louis S. B. Leakey, British anthropologist, at Olduvai Gorge in Tanzania, East Africa. He claims that three entirely different types of prehistoric men existed alongside each other at the same time in Africa.

Deadly Competition

This conclusion, says Dr. Leakey, means that man did not evolve through a carefully ordered, 1-2-3-4 step-by-step process up the scale to modern man. Rather he emerged as a result of deadly competition for survival against a rampantly savage nature as well as against beasts.

Reconstruction of skull fragments has led Dr. Leakey to believe that he has unearthed "a type of hominid which seems to differ, very markedly, both from the near-man *Zinjanthropus* and from a human-like species, *Homo habilis*." In fact, he sees it as ancestral to a previously discovered "LLK" skull.

Dr. Leakey said the new skull belonged to the group of man-like creatures called Pithecanthropine and dates back to about 600,000 years ago. He thinks it might belong to an African relative of the Far East's Java Man and Peking Man of about the same time period.

In addition, thousands of primitive stone tools were found with the *Zinjanthropus* and *Homo habilis* groups. Scientists have been trying to determine which species made them. Now, Dr. Leakey said that his new Pithecanthropine also made tools. "Any one of the three creatures might have made the tools," he said.

The significance of all this, Dr. Leakey finds, is that the evidence points clearly to three contemporary hominids. And this is contrary to the concept of orderly evolution.

At a recent symposium at the University

of Chicago on "The Origin of Man," Dr. Leakey suggested to his colleagues that "this is not really surprising since it is clear that man as a mammal must have evolved along ordinary mammalian lines with frequently contemporary species in the earlier stages of his evolution just as there were many contemporary species of pig side by side at Olduvai."

Colleagues Opposed

And there is where the anthropological fur begins to fly. Many of Dr. Leakey's colleagues were not and are not ready to accept his thesis.

To fully understand the character of the controversy, it is necessary to understand Dr. Leakey.

Not one given to timidity, he makes his pronouncements to the academic society with all the ardor of a sea captain speaking from his quarter deck.

A picture book Britisher, complete with full moustache and bluff manner, Dr. Leakey, 62, does not enter a discussion. He charges it full steam ahead. His forcefulness and deep courage of his convictions have won many points at the conference table but they have also led to accusations that he makes sweeping assertions without really knowing all the facts.

As a soft-spoken colleague at the conference table remarked, "The firmness of Dr. Leakey's statement exceeds the accuracy of his information."

Nevertheless, Dr. Leakey has proceeded with confident disregard for the subtleties and probing niceties of academic conversation. In so doing he so far has proven an adequate match for detractors.

Priceless Treasures

The basic strength of his position would appear to be the material he has dug up and his devotion of a lifetime to anthropology. There is unanimity among all colleagues that he has presented anthropology with priceless scientific treasures.

As one of his leading opponents, Dr. John T. Robinson, University of Wisconsin, Madison, put it at the Chicago conference, "There is no dispute over the value of Dr. Leakey's findings. My dispute with him is in their interpretation."

Dr. Robinson's thesis is that the ape-men who roamed the earth one million to two million years ago are so closely related to modern man that they should be in the same anthropological classification.

This new classification places in a single genus all forms of man in which culture is

an important adaptive mechanism. "Thus," he states, "the genus *Homo* should be extended to include all man's ancestors down through the Australopithecines, the first ape-men to shift from a vegetarian diet to a diet including meat."

Within the genus he would put two species, *Australopithecus* and *Homo sapiens*.

He challenged Dr. Leakey's finding of a third form of preman on the ground that the specimens are not sufficiently different from the Australopithecines to warrant, first, claiming a third species and, second, going on to conclude a competitive evolution for man.

Dr. Robinson and others believe there is ample room for differing physical characteristics within a genus.

Who is right? Take your pick.

What manner of creature was this that roamed the earth millions of years ago, eventually to father modern man? Drs. Charles F. Hockett and Robert Ascher, both of Cornell University, Ithaca, N.Y., recently drew vivid conclusions in a report on "The Human Revolution" in "American Scientist."

Early Man's Appearance

These anthropologists described proto-hominoids as living in East Africa about the Middle Miocene period of time, or about 25 million years ago. They see our ancestors as hairy, tailless, and a little larger than present-day gibbons. They had mobile facial muscles and no "mental eminence." They had large interlocking canines and could chew only up and down.

These creatures lived in bands of from 10 to 30, consisting of a very few adult males plus females and offspring. Each band is thought to have moved around in roughly defined territories but home base was a specific arboreal site where they built their nests.

They were expert climbers and spent much of their lives in trees. On the ground they could stand with a semi-upright posture. They could walk on all fours and could run on their feet.

Occasionally they would pick up a stick or a stone and use it as a tool. They may have reshaped such tools with their hands or teeth.

Diet Largely Vegetarian

Diet was largely vegetarian, supplemented by worms and grubs and sometimes small animals that were sick or injured and could not escape. They scavenged the remains of the kills of animals when they could.

Relations with neighboring bands were normally hostile or at best neutral. Yet, Drs. Hockett and Ascher believe there was enough contact to provide for some ex-

change of genes. The proto-hominoids apparently did not have the power of speech.

Some of the descendants of the proto-hominoids had to move out of the trees and become erect bipeds. Geological evidence suggests that during the time period in question, climate changes thinned out the vegetation, leaving stretches of broad plains with only clumps of trees.

Some bands of hominoids stayed with the trees, and their descendants are today's gibbons. Other bands were caught in small, rapidly diminishing groves. Those whose physiques made it possible for them to go across open country to another forest survived. Those that could not do this died out.

The two scientists attribute the trick of carrying as essential to survival. Early carrying, they say, consisted of transporting some weapon and scavenged food. Carrying led to more locomotion on foot instead of all fours, so the hands would be free. Moreover, holding a weapon and taking food from where it was found to another spot for later consumption shows the development of foresight and memory.

Among the proto-hominoids the band leaders were the strongest adult males. Once they learned to communicate through language, however, this was changed. The oldest members of the group were valued because they had had time to learn more.

What of Future?

Aside from natural curiosity of where we came from, the facts about the evolutionary process may give science keys to the future. Always intriguing is—what will man be thousands of years from now?

Who knows whether modern man is the final product? Evolution deals in terms of millions of years. It would be a courageous seer indeed to say that no further physical biological changes in man could possibly be forthcoming in the next million years.

Most anthropologists shun direct speculation on the future, properly preferring to limit themselves to statements on fact, at least fact as they interpret it. Most, however, will answer the question about future evolutionary changes with a question, "what will be the effect of the conquest of space or the effect of radiation on future generations?"

Methods for Protection Devised

Discussion of this issue must take into consideration that as man is putting radioactive material into the atmosphere, scientists simultaneously are devising methods to protect man and his food from contamination. For example, the U.S. Department of Agriculture announced recently that it is now possible to protect milk from radiation.

Moreover, nature has proved surprisingly tough in bouncing back after having been ravaged by nuclear explosions. In the seven years since the end of nuclear testing on Pacific atolls, plant life is practically back to normal.

Nevertheless, no scientist can be quite sure what man in the future will try to do to his world.

But for the present, the consensus appears to be that modern man is ideally suited to his current environment. If something should happen to change the environment radically, anthropologists concede that nature conceivably could change man to meet the future demands.

Regardless of what the future may hold, the fascinating quest for truth turns up new information, new discoveries and new theories.

As the theories of Darwin's day have become the fact of today, so should the theory of today become the fact of tomorrow as science moves step by step closer to understanding the origin of man.

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ZOOLOGY

Pituitary Removal Makes Brown Weasel an Ermine

► BY REMOVING the pituitary gland from a brown weasel, scientists have been able to change its fur to white, even in summer.

Weasels usually have a brown coat in the summer, which changes to white as the days get shorter and winter snow arrives. The white weasel is also called ermine, a valuable animal to fur ranchers.

Change in hair coat in spring occurs at about the same time as the onset of the animal reproductive cycle, said Dr. Charles C. Rust of the University of Wisconsin. Light stimulates the pituitary gland, which controls the sex hormones, so scientists speculated that the pituitary gland also controls the growth of summer and winter coats of hair.

By experimenting on 64 weasels, Dr. Rust showed that time of year and amount of light made no difference on the coats of those weasels with pituitary glands removed.

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ARCHAEOLOGY

Mexican Pyramids Show Signs of Early Writing

► AN INDIAN CIVILIZATION developed writing and accounting as early as 500 B.C., archaeologists have concluded from excavations north of Mexico City.

The symbols and letters and numbers on pyramids dating back to the third and fourth centuries B.C. indicate that the Indians developed the concept and practice of writing in about the fifth or sixth centuries B.C., Dr. Donald C. Brockington of San Diego State College believes.

The discoveries support anthropologists' theories that the first men to settle in North America were the big game hunters from Siberia who walked 1,000 miles across the frozen Bering Straits from Siberia.

Dr. Brockington advanced this theory from the latest archaeological discoveries in Mesoamerica.

Between 50,000 and 10,000 years ago, small bands of men called paleoindians entered America and migrated down the western regions into Mesoamerica. They were big game hunters and preyed on bison and mammoths, which were large elephant-like beasts, now extinct.

By 8000 to 6000 B.C. the climate of Mesoamerica changed and the paleoindians had to rely on wild vegetation for food. Chili peppers, squash, corn and beans became their major sources of food. The changing climate brought about technological advances in agriculture, as well as in pottery-making. The paleoindians began to build homes and live in villages, and by 3000 B.C. they were building pyramids.

The paleoindian population flourished in Mexico's Tehuacan Valley, north of Mexico City. It had reached 125,000 persons by 1519 when the Spaniards conquered the Aztecs.

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UNEARTHING EVIDENCE—Dr. Louis S. B. Leakey and his wife, Mary, dig and sort at Olduvai Gorge, Tanzania, East Africa. Their findings have been recognized as significant contributions to anthropology but have touched off controversy over the course of the evolution of man.