ANTHROPOLOGY

Cradle of Race Rocked by War

Hostilities Rage Where Earliest Known Human Once Walked Erect, Knew Fire, and Made Stone Tools

By DR. FRANK THONE

WAR'S FLAMES, flickering across the plains of China, are shedding their weird light on the original home of the whole human race.

Ancient Peking Man, *Sinanthropus pekinensis,* is the oldest of known human races, and stands in the direct ancestral line of modern man, declares Dr. Franz Weidenreich of Peiping Union Medical College. Dr. Weidenreich is now in this country, studying remains of other ancient races in American museums, consulting with fellow-scientists, and lecturing before learned societies on new discoveries about this First Citizen of the ancient world.

Dr. Weidenreich sees Peking Man as directly ancestral to Neandertal Man, now known from a considerable number of places in the Old World. And he agrees with a noted American fellow-anthropologist, Dr. Ales Hrdlicka of the U. S. National Museum, in regarding Neandertal Man as ancestral to the modern human race. He considers the much-disputed *Pithecanthropus erectus* of Java to be a Neandertaloid race, and probably considerably less ancient than *Sinanthropus.*

While Dr. Weidenreich makes known to occidental science the newest findings about Peking Man, his Chinese and European fellow-workers back home in Peiping are getting into the field for another season's digging for still more facts. War has not stopped their operations. The Japanese occupation of Peiping and surrounding territory last year took place so swiftly that no general destruction occurred. Since then, the Japanese authorities have not interfered in any way with the research.

As Usual

The only thing that Dr. Weidenreich fears is a possible flareup of bandit operations or guerilla warfare in the neighborhood of the caves, in the hills outside the city; but thus far nothing of the kind has threatened. In any case, the exploration of Peking Man's home is going on this summer as it has during past years.

In the laboratories in Peiping itself, the latest notable step in the study of this ancient race has been the reconstruction of a complete skull of a *Sinanthropus* woman, and the restoration over that of the features of this possible nth degree great-grandmother of our race. The work was done by Mrs. Lucile Swen, an American sculptor living in Peiping, under the direction of Dr. Weidenreich.

In making her portrait head of Peking Woman, Mrs. Swen first had to put her skull together. Several of the Peking skulls appear to be those of women, but they were all in fragments and none of them was complete. However, by taking pieces from several different skulls, it was possible to build a composite without filling in with any imaginary parts at all.

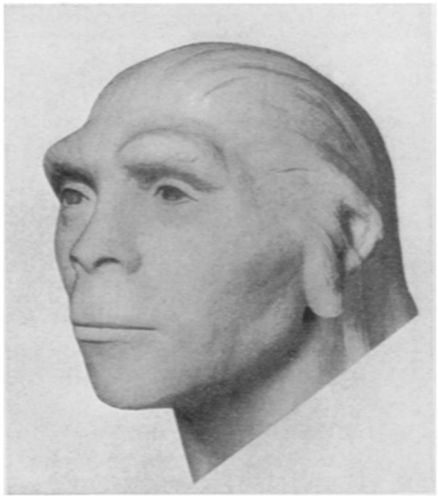
Having got her skull together, the American artist proceeded to clothe it with flesh and skin and hair. This was done by laying modeling clay over the skull cast, to thicknesses suggested partly by the tissue depths on modern Chinese women's heads, but more by the marks on the skull that showed where muscles had been attached.

Powerful Muscles

For example, it was necessary to give Mrs. Sinanthropus a tremendously thicker neck than any present-day Chinese woman has. Both the back of the skull and the powerful, chinless jaw showed areas of muscle attachment that made such a neck undeniable. Similarly, the cheeks had to be shaped in conformity with the dictates of the muscle masses needed to operate that heavy jaw. Eyebrow ridges were tremendously heavy on the Peking race, even on their women.

Peking Woman's nose was unquestionably low-ridged and flat: the longer, wider opening in the facial region of the skulls indicates that very clearly; and there is very little bony support at the top of the nose.

Partly concealed by the hair which the artist supplied is the low, flat arch of the skull, tremendously inferior to that of present-day skulls of Chinese and all other races. The widest part of the head was not near the top, as it is with all of us moderns, but low down and near the back. Also, the sides slope inward from the base upward, whereas in modern skulls the slope of the side walls is outward.



PEKING WOMAN

Reconstruction of the head of a woman of the Peking Man race, based on the skull, made under the direction of Dr. Franz Weidenreich by Mrs. Lucile Swen, American sculptor residing in Peiping.

Peking Man is able to offer a whole headfull of reasons for being regarded as the most primitive of known human beings, Dr. Weidenreich points out with both description and illustration.

Strong evidence is the arch of his skulltop, from front to back. It is the flattest, most gorilla-like, of all known human skulls. It is even flatter than one of the two Pithecanthropus skulls from Java—though admittedly the forehead is a little higher.

Gorilla-like, too, is a sharp notch found between forehead and the heavy ridge of the beetling eyebrows. This feature is far less pronounced in either Neandertal or Pithecanthropus skulls.

A character intermediate between the apes and present human races is the position of the opening through which the spinal cord passes. In apes this is at the back of the skull, pointing outwards. In modern man it is well under the base of the skull, pointing upwards. In Peking Man this opening is just bare-

ly under the base of the skull, and is visible from the back.

The brain within that peculiarly shaped skull was quite small, but still definitely within the human size range. Its volume amounted to 1,000 cubic centimeters (a little over a quart) on the average; the largest Peking skull thus far collected has a capacity of 1,220 cubic centimeters. Modern man averages 1,350 cubic centimeters, and the skull of Neandertal Man (surprisingly enough) may be able to hold even more—as much as 1,425. The smallest known Neandertal skull has a capacity of 1,290 cubic centimeters, or 90 more than the largest known Peking Man skull.

Brain Measured

Several of the nine skulls thus far collected were whole enough to permit casts to be made within their skull-cases, so that we know the size and shape of the brain as well as its total volume. It is a singularly small and flat brain, with several structures that strongly resemble corresponding ones found in the brains of apes. The front part particularly, supposed to be especially concerned with real thinking, is not nearly so fully developed as it is in present-day human beings.

Jaws and teeth, no less than skull and brain, argue for the primitiveness of Peking Man, Dr. Weidenreich said. Apes have jaws with teeth arranged in a narrow horseshoe arch, and so has this ancient human of China. Modern man has a dental arch with relatively smaller and weaker teeth, but it is wider across the back and flatter across the front.

The teeth, too, tell of primitive development. They are all big—in some instances bigger than comparable teeth in apes. The molars were all of the same size, whereas in modern man the third molars, or wisdom teeth, are smaller and sometimes fail to develop fully at all. The eyeteeth, though not such fangs as one sees in gorillas, were noticeably bigger and very much longer-rooted than the corresponding teeth in our own jaws. The crown-patterns of all of them, and especially those of the molars, were more complex than those of modern man, and more like those of apes, both modern and extinct.

One feature of these big, primitive teeth will be eyed enviously by all of us moderns, with the sole exception of the dental profession. Not one of the 148 teeth and 13 lower jaws of Sinanthropus thus far discovered shows any sign of caries, pyorrhea, or any other tooth troubles. This is admittedly not a large sample, yet it would be practically impossible to assemble a random collection of 148 modern teeth without at least some cavities.

For all his primitiveness, Sinanthropus already had some traits found in modern men, and especially in the modern men of his own homeland. A peculiar shovel-shape of the incisor teeth, and a roof-like ridge along the top of the head, are Chinese features found in both present and ancient inhabitants of this part of Asia. The same kind of a ridge marks the skulls of Eskimos, Australians, and American Indians. There are some other skull features held in common by Peking Man, modern Mongolians, and certain other peoples believed to be related to the Mongolian stock.

It is a little awesome, to think that the proverbially persistent Chinese may actually have persisted in that one place for five hundred thousand years!

The most recent find proves that Peking Man walked fully erect, like a human being, not stooping over or shambling, and certainly not using his hands as organs of locomotion. Bones other than skulls were exceedingly rare from earlier finds, but just before Dr. Weidenreich sailed for America one of his colleagues dug up a nearly complete thighbone and fragments of two other leg bones.

Shape and size indicate erect posture, and suggest that the owner was a woman. If that was really the case, then the ancient Peking race had full human stature as well; for estimates based on the length of the thighbone indicate a height of about five feet four inches.

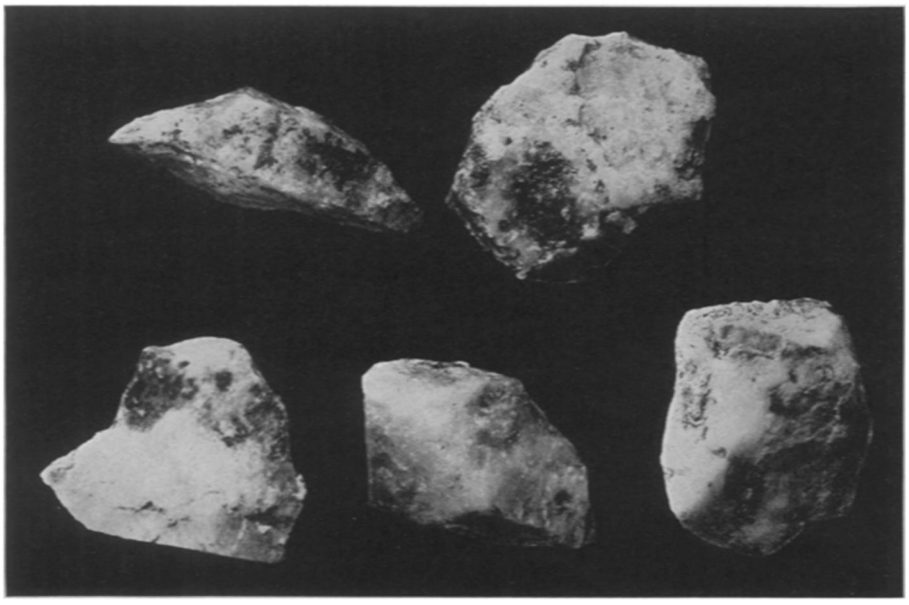
Another thing these new leg-bone discoveries suggest, in confirmation of a theory already held on account of the broken condition of all the skulls thus far found. The leg-bones had been cracked open, and were blackened by exposure to fire. Peking Man stands accused of having been a cannibal.

But perhaps too much has been made of this cannibalism indictment. After all, Mr. and Mrs. Sinanthropus had to eat something besides each other and the neighbors. Bones from their ancient feasts are buried in the accumulated debris of their caves. It is a good thing that Mrs. Sin wasn't a tidy housekeeper, because her messy habit of letting things lie right where they fell has left us this bone-written record of the Ice Age animals they ate. That is the main source of information which scientists have for the antiquity of Peking Man.

They weren't exclusively meat-eaters, either. Of course, since roots and herbs don't have bones, we don't know very well what vegetables graced the Sinanthropus table. But Peking Man apparently did have a great fondness for one

HOME

A cave in the Western Hills at Choukoutien, in northern China, where the story of the life of early Peking Man has been preserved. The charred bones of large animals indicate that he probably cooked his food here. Cutting and scraping implements of quartz found in the ashes give an idea of the early stage of cultural development of their maker.



MAN-MADE

Flint tools made by Peking Man are rough, but effective. As a tool-shaper, Sinanthropus showed himself very definitely human.

vegetable product that we of today would hardly regard as worth the bother of gathering and cracking. Along with the bones of his game animals (including other *Sinanthropi*) in the caves, there have been found great quantities of the hard shells of the small, nutlike oily seeds of the hackberry tree. Maybe these were the early equivalent of soybeans, present-day China's great source of food oil.

Those hackberry nutshells convey to scientists not only information regarding one item in Peking Man's diet, but also an important bit of climatological data. Hackberry trees belong to the temperate zone—they are common over a large part of the United States today. The hackberry evidence is backed up by the identification of a bit of charred wood as being from a redbud tree—again a member of the temperate zone flora.

To speak of the culture of civilization of Sinanthropus may seem a bit high-falutin', in the face of what we have seen of what he looked like and the way he lived. Yet he did have a definite culture level, even though an humble one. He knew how to make stone implements that could be used for cutting wood and flesh, digging in the earth, and possibly for hunting game and fighting with his own kind. Most important of all, he already knew the use of fire; and this discovery is rated by anthropologists as the greatest single step forward in the history of the whole human race.

So take him as you find him, beetle brows, thick neck, cannibalism and all, old *Sinanthropus pekinensis* wasn't the kind of a grandfather who'd thank any of his descendants for being ashamed of him. With all his faults, he certainly was a man.

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TECHNOLOGY

Compounded Wood Is New Milling Advance

THE old practice of veneering furniture, which turned out a mahogany table for $5, is back in a new and much more fundamentally important form.

Compounding wood, as the process of veneering is known to the trade, is now turning to the new field of making wooden beams which have all the uniformity of characteristics of steel and other metals. Do you wish a wood with a given density, a given elastic strength and other properties? Compounded wood is the answer and each time you place an order with the mills it comes through the same, time after time.

Wood unsuited for many construction purposes becomes the core of the plank and laminated layers supply the exterior. The proportions of each are varied so that the same characteristics can be repeated at will.

In part the use of phenolic resins as the gluing agent in the finished board is the difference between older veneer panels and the new beams of technologic mill working. The various layers of wood are arranged in "books", dried, coated with the resin, heated electrically and finally pressed at proper temperatures into finished lumber.

"These boards," states the Industrial Bulletin of Arthur D. Little, Inc., "meet predetermined specifications, with widths previously unavailable, and with a uniform adherence to specification comparable to that of the steel construction industry."

The resin used in the process impregnates the board with vapors which are obnoxious to fungi and thus the long-sought fungus-proof board is at hand.

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