Java Man’s First Tools

About 1.7 million years ago, a leggy human ancestor, Homo erectus, began prowling the steamy swamps and uplands of Java. That much is known from the bones of more than 100 individuals dug up on the Indonesian island since 1891. But the culture of early “Java Man” has been a mystery: No artifacts older than 1 million years had been found—until now.

At the meeting, archaeologist Harry Widianto of the National Research Centre of Archaeology in Yogyakarta, Indonesia, wowed colleagues with slides showing stone tools found in sediments that he says were laid down 1.2 million years ago and could be as old as 1.6 million years. The find, at a famous hominid site called Sangiran in the Solo Basin of Central Java, “opens up a whole new window into the lifeways of Java Man,” says paleoanthropologist Russell L. Ciochon of the University of Iowa in Iowa City.

Although hominids apparently evolved in Africa, Indonesia is a Garden of Eden in its own right, with a wealth of Homo erectus fossils. The startling discovery 2 years ago of “hobbits”—the diminutive Homo floresiensis of Flores Island—added a controversial new hominid to the Indonesian menagerie.

In 1998, Widianto found stone flakes in the 800,000-year-old Grenzbank layer at Sangiran, whose well-plumbed sediments reach back 2 million years. Then in September 2004, his team struck gold in a layer dated by extrapolation from the rocks around it to 1.2 million years ago. Over 2 months, they unearthed 220 flakes—several centimeters long, primarily made of chalcedony, and ranging in color from beige to blood red—in a 3-by-3-meter section of sand deposited by an ancient river.

The find, not yet published, could be even more spectacular than Widianto realizes, says Ciochon. His team, which also works at Sangiran, has used ultraprecise argon-argon radiometric methods to date the volcanic strata overlying the levels excavated by Widianto to 1.58 million to 1.51 million years ago—making the flakes at least 1.6 million years old. If the flakes were undisturbed, Ciochon says, they would represent “some of the earliest evidence of the human manufacture of stone artifacts outside of Africa.” Their antiquity would match that of the oldest flakes found in China, at Majuangou, dated to 1.66 million years ago and also made of chert.

But not everyone is convinced. Although the chert flakes are abraded, possibly by water, a few limestone flakes are remarkably sharp. “The difference in preservation condition could indicate that we are dealing with secondary deposition,” or flakes of different ages mixed together, cautions archaeologist Susan Keates of Oxford University in the U.K., who was at the talk. Others disagree. “I feel their excavation is reliable, because the deposits are thick and undisturbed,” says Hisao Baba, curator of anthropology at Japan’s National Science Museum and the University of Tokyo, whose team has also uncovered Homo erectus fossils and flakes on Java.

The Sangiran flakes “are fundamentally different”—smaller—than the stone choppers made by Homo erectus in Africa, says Ciochon. The evidence, he argues, suggests that Java Man had to range far for small deposits of good flint or chert and so created small, finely worked tools in contrast to the larger tools found in Africa. Considering the scarcity of raw materials on Java, Ciochon says, it’s “a remarkably fine technology.”

Widianto will resume excavations in June. “I will be going deeper and deeper, older and older,” he promises.

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“The only place in the world where this construction is known is the Mediterranean,” says Bellwood, who presented the find in Manila. Shipwreck excavations show that several cultures, including the Egyptians, Greeks, and Romans, employed mortise-and-tenon technology from at least 3300 years ago until around the middle of the first millennium C.E.

Hunting for similar construction in Vietnam, Bellwood and his colleagues found a museum piece made from timbers bearing the same mortise-and-tenon technique. The timbers, part of a mortuary house for an infant coffin made around 200 C.E., are planks from a boat scrapped for burial, Bellwood says. Both the mortuary house and the Dong Xa boat were found in clay deposits near the Red River.

Bellwood doubts that the two cultures ever met face to face. “I don’t believe we have Romans sailing to Southeast Asia,” he says. “It would be nice to say it was invented independently,” he adds, noting that the Chinese used mortise-and-tenon carpentry for houses in the Neolithic, centuries before the technique was applied to Mediterranean ships.

But how the ancient people near the Red River learned their boatmaking remains a mystery. “At present, there is just not enough evidence to support cultural influence in construction choice,” says Blue.

Bellwood favors a series of transfers across the ancient world 2 millennia ago, when the Old World was entering its first phase of true globalization. That’s the “most attractive hypothesis” for now, he says—at least until a Chinese Neolithic log boat is discovered.

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