Asian hominids make a much earlier entrance

Members of the human evolutionary family left Africa and reached eastern Asia 800,000 years earlier than previously thought, according to a report in the Feb. 25 SCIENCE.

The new estimate comes from a redating of three *Homo erectus* specimens from the Indonesian island of Java. Local collectors found a skullcap of a child at one site in 1936 and partial skulls of two individuals at another site in 1974. The first skull now dates to about 1.8 million years ago, the latter specimens to approximately 1.6 million years ago.

Carl C. Swisher III, a geochronologist at the Institute of Human Origins in Berkeley, Calif., and his colleagues analyzed the relative proportions of two forms of argon in the hominid-bearing sediment from the Indonesian sites to establish new dates for the finds.

Many anthropologists express surprise that *H. erectus* ventured to the far reaches of Asia so early. However, contrasting theories of how the *Homo* lineage evolved – which rely on analyses of skeletal anatomy – remain unchanged in the wake of the new study (SN: 6/20/92, p.408).

"It shocks me that hominids [members of the human evolutionary family] lived outside Africa that early," asserts David W. Frayer of the University of Kansas at Lawrence. "We'll have to see if these dates hold up."

Frayer and others would prefer age estimates generated from sediment that still clings to the Indonesian bones, but Indonesian officials barred the removal of any material from the fossils, Swisher says. Comparable results at the two sites, located about 150 miles apart, compellingly support the new dates, he argues.

H. erectus apparently reached Asia before the appearance of stone choppers and hand axes in Africa around 1.4 million years ago, Swisher holds. This helps explain why no such artifacts have emerged from Asian sites, he maintains.

African fossils formerly assigned to *H. erectus* may belong to a separate species that led to modern humans, Swisher suggests. In this scenario, championed by Bernard Wood of the University of Liverpool in England, *H. erectus* reached an evolutionary dead end in Asia.

G. Philip Rightmire of the State University of New York at Binghamton disagrees, based on his anatomical comparisons of Asian and African fossils.

"*Erectus* originated in Africa and then pushed out to Asia in pulses of movement," he argues. "The surprising new dates indicate that these migrations, and the *Homo* lineage itself, have more ancient roots than we thought."

Reasons for the migration of African *H. erectus*, often linked to the production of versatile hand-axes, now seem unclear, Rightmire contends. And much uncertainty surrounds the relationship of the *Homo* lineage to African australopithecines, which consist of the earliest hominid species. If *H. erectus* left Africa by 1.8 million years ago, its ancestor must have evolved simultaneously with various australopithecines, Rightmire notes.

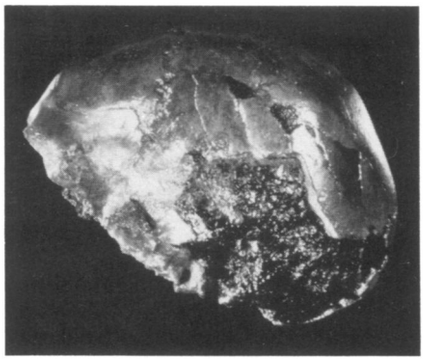
Milford H. Wolpoff of the University of Michigan in Ann Arbor offers a third interpretation of the Java dates. Wolpoff lumps all *H. erectus* fossils into an anatomically diverse group of *H. sapiens* that evolved in several parts of the world starting about 2 million years ago.

"These new dates tell us that primitive *H. sapiens* left Africa much earlier than we thought," he holds.

Recent finds of simple stone tools at a Javanese *H. erectus* site that may date to 750,000 years ago suggest that Asian hominids probably concentrated on cutting bamboo with quickly produced implements, Wolpoff asserts; knowledge of hand axes may simply not have been put to use.

A related report, published in the March 3 NATURE, concludes that *H. erectus* and *H. sapiens* may have lived simultaneously in China for a short time.

Measures of the rate of uranium decay in animal teeth uncovered last year in the same deposit as a *H. sapiens* skull place the finds at a minimum of 200,000 years old, assert Chen Tiemei of Peking University in Beijing, China, and his coworkers. Some Chinese *H. erectus* remains date to 300,000 years old or less. *– B. Bower*



Swisher

Side view of 1.8-million-year-old skullcap from Java.

Growth factor predicts cancer's spread

Ancient physicians would hold a flask of urine to the light, turning it this way and that in search of signs of disease. Modern researchers are perfecting a more sophisticated version of that test, homing in on urinary concentrations of a growth factor involved in cancer's deadly spread.

Researchers had previously demonstrated that a peptide called basic fibroblast growth factor could trigger the beneficial growth of vessels supplying the heart with blood (SN: 1/29/94, p.71). The dark side of this growth factor, and others like it, is that they also boost a tumor's blood supply, thus enabling it to grow and metastasize to distant parts of the body.

Now, a simple test that measures the concentration of basic fibroblast growth factor in the urine may indicate a cancer's aggressiveness, according to a new study by Judah Folkman of Harvard Medical School in Boston and his colleagues.

Folkman and his team knew from their previous work that basic fibroblast growth factor predicts the extent of bladder cancer, but they wanted to find out whether the peptide could do the same for other types of cancer. They therefore analyzed urine samples collected from 950 people with a range of malignancies (including cancers of the breast, colon, and lung) and 285 controls who did not suffer from cancer of any kind.

The team found elevated concentrations of the growth factor in the urine of some cancer patients in every category except cervical cancer. "This is the first demonstration that a wide variety of tumors produced abnormally high levels of basic fibroblast growth factor," Folkman told SCIENCE NEWS. The researchers describe their work in the March 2 JOURNAL OF THE NATIONAL CANCER INSTITUTE.

Compared to controls or cancer patients whose disease had not spread, people with cancer that had migrated to other parts of their body had the highest concentrations of growth factor in their urine samples.

The team monitored a subset of cancer patients after an operation had been performed to remove their primary tumor. People whose tumor had not metastasized showed normal urinary concentrations of growth factor within a short time after surgery. By contrast, people whose cancer showed evidence of advancing continued to demonstrate elevated amounts of growth factor in repeated urine tests.

If further research confirms these findings, oncologists may one day rely on this urine test to gauge a cancer's severity. "In a patient with a known tumor, you could use the urine to monitor whether or not that tumor progresses," comments Anton Wellstein of Georgetown University in Washington, D.C. If such a test indicates that the cancer continues to spread after the initial treatment, oncologists could rev up treatment, says Wellstein, who wrote an editorial that appears in the same issue of the journal.

Use of this test as a general screen for cancer appears less likely, Wellstein says, noting that cancers in their early stages probably don't release enough of this peptide to be identified.

– K.A. Fackelmann