

New looks at health risks from radiation

Women face roughly twice the risk that men do — per unit exposure — of developing radiation-induced cancer. At the same time, the risks are virtually negligible for women, as compared with men, that they can pass on to future generations damage caused by their exposure to ionizing radiation. These are among the findings in an 800-page review of radiation health effects, parts of which were released last week, by the National Research Council's Committee on the Biological Effects of Ionizing Radiation (the BEIR committee).

Commissioned by the Environmental Protection Agency in 1976, this analysis of research, some yet unpublished, looks at risks posed by radiation from all sources in an attempt to provide the most accurate summary of genetic and nongenetic human-health effects. And the report's preface states in part what the BEIR committee saw as its mission: "that the information contained herein will serve not only as a summary of present knowledge... but also as a scientific basis for the development of suitable radiation protection standards."

But if the committee's goals are concise, opinions shared by its authors on the effects of low-dose exposures to radiation are less so. In fact, so great was the dissension of five members that they issued a "dissenting report" saying that risk estimates in the overall report overestimate hazards in the low-dose range by perhaps an order of magnitude. "I think their position is scientific nonsense," Edward Radford told SCIENCE NEWS. The University of Pittsburgh epidemiologist, who also chairs the BEIR committee, has offered to debate the dissenters in an open scientific forum.

An unrelated report on a similar theme was released through the National Academy of Sciences a week earlier. Looking only at risks posed by the U.S. nuclear power industry, the report predicts that as many as 2,000 excess cancer deaths may result from routine emissions in the fuel cycle (from the mining of uranium to the eventual storage of reactor wastes) throughout the period from 1975 to 2000.

"Risks Associated with Nuclear Power" is a review of literature in the field focusing primarily on surveys and evaluations of the thousands of published technical reports. Issued as a support paper to the long-awaited (and still unpublished) report by the National Academy's Committee on Nuclear and Alternative Energy Systems (CONAES), it was prepared by a panel chaired by W. Conyers Herring of Stanford University.

Herring told SCIENCE NEWS that prediction of the 2,000 excess cancer deaths results from extrapolations using a widely held assumption — but one with which some authorities disagree — that each

2,500 person-rem to which a population is exposed might result in one additional cancer death. (A rem is the absorbed dose of any type of radiation that produces the same biological effect as one rad of therapeutic X-rays. Person-rem is a term that accounts for random distribution of exposures to a population at risk. For example, 200 person-rem could describe 200 persons each exposed to one rem, or, in the most extreme case, one person exposed to 200 rems.)

The report estimates that each gigawatt (GW) of electricity produced by nuclear power will result in a cumulative popula-

tion exposure throughout the fuel cycle equal to 2,500 person-rem. Escalating figures for nuclear power available in 1975 to what was — at least prior to the Three Mile Island accident — expected at the turn of the century yields the 2,000 cancer-deaths figure. The report contrasts that figure with an estimate at least six-fold higher for deaths associated with mining and transporting the coal needed to produce a GW of electricity. Both new reports conclude that risks from low doses of radiation are so small as to be almost undetectable against the spontaneous cancer and disease rate in man. □

Primate origins in S.E. Asia?

A team of Burmese and American scientists have found what they say are the earliest known fossilized remains of anthropoid primates, the suborder of animals that now include humans and monkeys. Small jaw fragments discovered in the Pondaung Hills area of northern Burma have been dated at 40 million years — some 10 million years older than the earliest anthropoid primate fossils found in Africa.

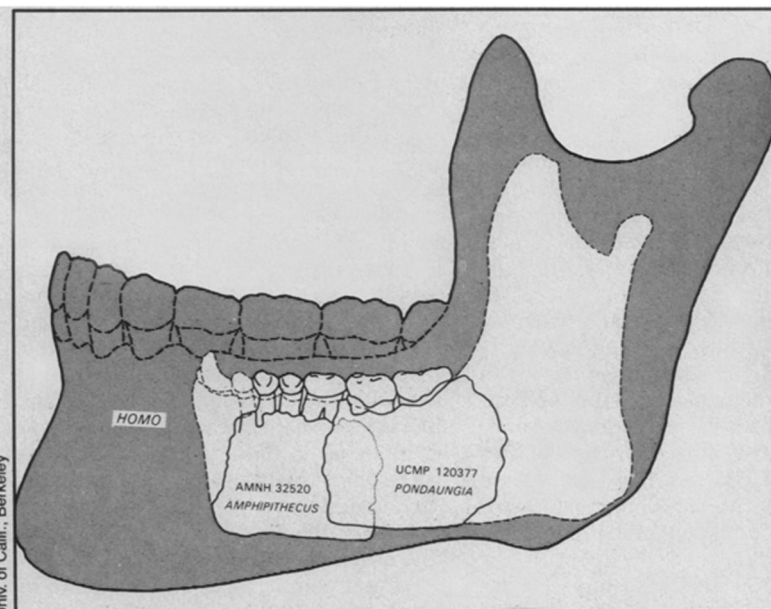
The discovery was made by Donald E. Savage, professor of paleontology at the University of California at Berkeley, a former graduate student, Russell L. Ciochon, now assistant professor of anthropology at the University of North Carolina at Charlotte, and a team of researchers from the Mandalay Art and Sciences University in Burma. Participation of the U.S. scientists is being sponsored by the Smithsonian Foreign Currency Program and the L.S.B. Leakey Foundation. A formal report on the research results has been submitted for publication to NATURE.

The discovery could well shift the focus of research into early anthropoid evolution. Although some early primate fossils

were discovered in the Pondaung Hills in the 1920s, attention in recent years has centered on Africa, particularly the area around Fayum, Egypt, where 30-million-year-old fossils have been found. The new findings, says Savage, "certainly put Burma back into consideration as the evolutionary center for anthropoids. ... We think there is a lot more to be found there."

The two specimens have been assigned new genus designations: *Pondaungia* and *Amphipithecus*. Both are thought to have been about the size of today's Gibbon apes. They were identified as higher primates on the basis of advanced development of jaw and tooth structure, which already shows distinct similarities to that of present-day humans and apes.

What is still not clear is whether those animals represent direct ancestors of humans or side branches of the primate family tree. To learn more about their distribution and later development, Savage and Ciochon have proposed a further joint research project. Such collaboration has provided Burmese scientists with access to specimens and facilities not otherwise available to them. □



Reconstructed jaw fragments recently found in Burma bear striking resemblance to the jaw of modern man and may represent the earliest known anthropoid primates.