minated the sample. In 1970, a piece was sent to Berger who used solvents to remove the tar and other toxins from the timber. He then used the C-14 method to date the sample at 1,230 ± 60 years. "I determined the English had been correct," he says.

The wood, however, is curved and apparently shaped by man, Berger notes. He proposes that a scientific excavation team be dispatched to Ararat in an effort to reconstruct exactly what type of structure stood there. Because part of the mountain sits in the politically touchy region of the Russian border, Turkish officials have so far refused permission for such a full archaeological investigation. □

Rockfest 8: Still breaking new ground

"We're sort of in a retrenchment stage," says Sean C. Solomon of the Massachusetts Institute of Technology. "The amount of data coming in is not zero, but it's slowing down." At the NASA Johnson Space Center in Houston, hundreds of researchers met last week in their eighth annual Lunar Science Conference since the Apollo astronauts began bringing pieces of the moon back to earth, and the years-long peak of the investigative effort has understandably leveled off somewhat. Yet, plenty is still going on. Last week's "rockfest" revealed new discoveries about the samples, new research techniques, new information about the moon itself and even a new piece of the moon.

The new sample was a 2.3-gram portion of the 160-centimeter core gathered last August by the unmanned Soviet Luna 24 spacecraft in the northeastern portion of the moon's Mare Crisium. Officially presented at the meeting (it had actually been sent several days before by diplomatic pouch), it followed a 0.7-gram portion from the same core that was picked up in Moscow last December by U.S. officials at Soviet invitation (SN: 12/18-25/76, p. 390). The overall core, according to Soviet scientists at the rockfest, shows as many as 10 to 20 distinguishable layers, most of them in the bottom 90 centimeters, but a "fairly uniform" chemical composition. "In general," says Valery L. Barsukov, director of the Vernadsky Institute of Geochemistry and Analytical Chemistry, "fresh fragments of relatively abyssal rocks or fragments representing the interior parts of basaltic flows are predominant. . . ." There seem to be no fragments from surface basaltic eruptions, and only a few traces of igneous rocks from the highlands some 60 kilometers away.

There is at least one surprise, however: signs of an unusual calcium-chromium silicate. "Apparently," says Barsukov, "this represents a new, previously unknown mineral," at least on the moon. There have also been hopes that the top of the core might contain the additional bonus of material ejected from the crater Giordano Bruno on the lunar far side, which would make it the first sample of the part of the moon that is never seen from earth. Some rockfest attendees, however, were left with the impression from the Soviet descriptions that the critical surface layer might have been disturbed or even pushed aside altogether in the sampling process.

The Apollo samples, meanwhile, have yielded a surprise of their own. David T. Vaniman and James J. Papike of the State University of New York at Stony Brook reported the discovery of a very-low-titanium mare basalt in the drill core taken by the Apollo 17 astronauts in the moon's Taurus-Littrow Valley. Titanium is a key element in studies of the moon's early heating and differentiation, and the newly found traces contain less than 1.5 percent by weight of titanium oxide. How the low-titanium basalt got to Taurus-Littrow is uncertain. Earth-based reflectance studies show similiar TiO_2 levels in basalts of the Imbrium, Frigoris and Crisium basins (the Luna 24 sample from Crisium yielded similar concentrations), but the abundance of "imported" material in the Apollo 17 core suggests that the source may have been much closer. In central Serenitatis, for example, there are signs of basalts with as little as 2 to 3 percent TiO_2 reaching to within 100 kilometers of the Apollo 17 site. The new discovery, says Anthony E. Bence, also of Stony Brook, "may bring about major reconstruction in lunar evolutionary models."

The conference also continued last year's efforts to bring the weight of lunar research to bear on other parts of the solar system (SN: 3/27/76, p. 196). Robert C. Reedy of Los Alamos Scientific Laboratory, for example, was able to use the short-lived isotopes sodium 22 and iron 55 (half-lives of 2.6 and 2.7 years respectively) in Apollo 11, 12 and 14 samples to further enforce the recent theory that the solar constant—the sun's output—is not so constant after all. The isotopes are produced by solar protons, and Reedy was able to use them, together with earlier work on much-longer-lived isotopes, to provide the first "direct" evidence that the average proton flux in the solar cycle from 1953 to 1963 was about five times the average flux over the preceding million years, as well as over the following cycle.

There were scores of other reports, and construction of an improved facility to house the moonrocks began at JSC on the first day of the meeting. Some attendees complained about plans to shut down the ALSEP instrument packages on the moon by Oct. 1, and there was plenty of lobbying for the proposed Lunar Polar Orbiter. "We're getting down to the hard work now," says John B. Adams of the University of Washington in Seattle. "We've really just begun." □

NAS: EPA effort needs some revising

An 11-volume report being issued by the National Academy of Sciences concludes that the Environmental Protection Agency has performed its function pretty well, considering restrictions placed on it, but that new legislation is needed to straighten out inefficiencies and inconsistencies in the federal environmental effort.

Comprehensive protection of the environment can no longer be provided by considering pollution of air, land and water separately, the report says. New legislation should take into account the interconnections between land-use planning and various kinds of pollution. Also, better lines of authority should be established among the different government agencies responsible for enforcing rules.

The report calls for consideration of economic incentives to replace outright regulation in many areas of environmental protection: "From one point of view, it makes no difference whether EPA is empowered to say, 'Thou shalt not emit more than so much SO_x,' or to say, 'For every bit of SO_x emitted, thou shalt pay so many cents.' In principle, the same goals can be achieved either way." Economic incentives, for example, are generally more flexible, involve less overall cost and tend to stimulate greater research effort to find nonpolluting alternatives.

The EPA should also have more power to conduct its own "anticipatory research," the report concludes. Such research would help forestall problems as they develop, rather than having the agency just respond to crises as it tries to enforce legislative standards based on sometimes outmoded data. By granting contracts to outside experts to perform this research, EPA would also involve more of the scientific community in the effort to find new ways of monitoring and protecting the environment. □

Indonesia's second satellite launched

Indonesia's second satellite, Palapa 2, was launched March 10 by the U.S. National Aeronautics and Space Administration. Like Palapa 1, launched last July 8, it is a communications satellite, designed to relay voice, picture and data traffic from a geosynchronous orbit that holds it fixed over one spot on the earth. Although two satellites may seem ambitious, they may, in fact, be the only way to effectively address some of the rapidly growing communications needs of the world's largest archipelago, in which the inhabitants are spread throughout as many as 13,000 individual islands. Indonesia will reimburse NASA for the launch costs. □