



NASA

Mitchell and Shepard with the largest rock returned from Fra Mauro region.

could mean that the rocks were split a thousand or a million years ago: their surfaces would still be considered young. The investigators hope to determine when and how the rock was split.

Another Apollo 14 feature is the abundance of friable or crumbly rocks. Scientists are not yet ready to explain why these were not found in such abundance in the maria. But the astronauts reported while on the surface seeing many boulders which appeared weathered and fragile on the outside, but which were hard inside.

The rocks include some very hard ones ranging in size from a walnut to a basketball. The largest weighs about 20 pounds and measures about $10 \times 10 \times 11$ inches. Two smaller football-sized rocks weigh from 7 to 12 pounds each and two grapefruit-sized rocks, from 3 to 5 pounds each.

They differ from Apollo 11 and 12 rocks not only in size but in type and composition. The Apollo 11 returns were divided equally between breccia—fragmented rocks, usually coarse grain, formed by crushing or some sedimentary process—and basaltic rocks—finer grained, crystalline or igneous rocks. The Apollo 12 returns were higher in crystalline content.

The Apollo 14 rocks, on the other hand, are much more fragmented. Another unusual feature, according to Dr. Dale Jackson of the U.S. Geological Survey and Dr. Everett Gibson of MSC is the fine grain of the material—“almost like silt stones.” This is unlike anything seen before from the moon. There are some brecciated rocks but they look different from the Apollo 11 and 12 breccias. Only one rock appears as a crystalline basalt. “It is the only unambiguous igneous rock” in the batch, says Dr. Gast. This means that little, if anything, has happened to the rock (such as shock metamorphism) since its crystallization. Its contents are simi-

lar to the Apollo 11 and 12 basalts with one exception—it has two types of pyroxene instead of only one. This is an indication that it could be related to KREEP, if, in addition, it turns out to have a high content of potassium, uranium and thorium.

This week's debriefings refined one further fact about the crew's climb up Cone Crater. The men came within 50 feet of the rim. □

CERN ACCELERATOR

300-GeV machine approved

The council of CERN, the European Organization for Nuclear Research, approved construction Feb. 19 of CERN II, a proton accelerator of 300 billion electron-volts energy. The project, which has been subject to several years delay involving changing plans and dithering by several countries over the question of participation (SN: 12/12/70, p. 445), will go forward with 10 countries contributing: Austria, Belgium, France, West Germany, Italy, the Netherlands, Norway, Sweden, Switzerland and the United Kingdom. The new accelerator will be built on a site across the road from the present CERN laboratory in Geneva. Like the present laboratory, it will straddle the border between France and Switzerland.

The new proton-synchrotron will be at least 10 times larger than the existing CERN 20-30 GeV accelerator, which has been operating now for nearly 12 years. The program of construction is to begin sometime this summer and last about eight years, with research planned to begin during the sixth year, in 1976.

Dr. John B. Adams, a physicist long associated with CERN and with the Culham Laboratory in Great Britain, is the Director-General of CERN II. □

ALASKA PIPELINE

Search for alternatives

The proposed pipeline from Alaska's North Slope to the port of Valdez has looked like a sure thing for a long time despite conservationist opposition (SN: 1/23/71, p. 64). No one really believed conservationists could successfully buck the economic power of the oil companies and an entrenched public belief in progress as measured by the pace of new technological development.

So hearings held last week on the pipeline by the Interior Department were viewed by many as merely a sop to the conservationists. One Interior official had gone so far as to say the hearings could not produce new information substantial enough to require any major revisions in Interior's pro-pipeline draft report on the massive project.

But rumblings of official unhappiness with the pipeline began just before the hearings when Russell Train, chairman of the Council on Environmental Quality, told a television audience that CEQ was less than satisfied that the pipeline was the best alternative. That Train's view reflected other high views in the Administration became clear after the hearings when Interior Secretary Rogers C. B. Morton said he was impressed by conservationist arguments; he was, he said, a long way from deciding the pipeline was the best way to meet the energy requirements of the nation.

Morton's statement, made at a Senate appropriations committee hearing, strongly emphasized a point conservationists have been making for a long time: That the nation lacks any sort of coherent energy policy which could demonstrate that the Alaska oil is really badly enough needed to justify the risk to the environment in building the pipeline.

Train's comments indicated that he does not necessarily oppose development of the Alaska oil. Rather, he suggested that there may be alternatives to the Alaska pipeline. One, he said, would be an all-land route for the oil via a pipeline through Canada.

Canadian officials, who say they fear the damage spilled oil from tankers might do to their Pacific Coast, have lately been suggesting such an alternative. And two Alaska state legislators, concerned about the effects spilled oil could have on Alaskan fisheries, introduced a resolution for study of the Canadian alternative.

Conservationists at the hearings strongly stressed the need for more studies and for a review period after Interior incorporates information from the hearings in its draft report. Morton's statement is a strong indication they