Apollo 16's samples most complicated yet

Apollo 16 Commander John W. Young called the Descartes landing site "mysterious" as he stepped foot on the surface of the moon's Central Highlands (SN: 4/29/72, p. 276). After a quick look at some of the returned samples this week, it appeared that Descartes may remain puzzling for some time to come.

"We will be faced with a problem more difficult than Apollo 14," says Michael B. Duke, curator of the lunar receiving laboratory at NASA's Manned Spacecraft Center in Houston. (The Apollo 14 samples have been difficult to unravel because they are mostly breccias formed by one impact after another. It is difficult to trace the origin and history of such rocks.) "The rocks appear even more complex than 14. It will be difficult to mine the details, but more challenging than straight igneous rocks."

Technicians were still unbagging rocks and soil this week, as the preliminary examination team (PET) began its work. Young, Charles M. Duke and Thomas Ken Mattingly brought back more lunar material than any other flight—two large boxes of rocks and six sample-collection bags that contain 20 to 25 pounds of material each. Only three of those bags had been emptied early this week and already the number of documented samples (rocks photographed on the lunar surface before they were picked up) had exceeded the total for all of Apollo 15—41 samples. Michael Duke expects about 100 documented samples from Apollo 16.

The only hard data so far on the rocks have been the counts of the radioactive content of four rocks and one soil sample. According to Paul W. Gast, PET chairman, the radioactive content of the samples lies on a scale between the Apollo 12 samples and the Apollo 14 samples. The potassium content ranges from 1,000 to 3,500 parts per million (ppm); the thorium, between 3 and 8 ppm; and the uranium, between 0.8 and 2.5 ppm. The Apollo 14 material had the highest average radioactive content of any material returned so far—potassium, between 3,000 and 5,000 ppm; thorium, between 10 and 15 ppm; and uranium, between 2.5 and 4 ppm. "From the first look," says Gast, "it appears that the radioactivity at Descartes is somewhat higher than the gamma ray [orbital spectrometer] average for the farside highlands." Some scientists had expected the nearside highlands in which Descartes is located to be similar in radioactive content to the farside highlands. The uranium content for example, of the farside, ranges from only 0.5 to 1.0 ppm. They do not understand why most of the radioactive elements identifiable at the surface seem to be concentrated in only one area of the moon—the western maria (SN: 5/6/72, p. 292).

The ultraviolet camera (SN: 4/15/72, p. 247) that operated on the moon while the crew was collecting the samples has yielded a puzzle of its own—an unexplained band circling the earth. The camera took pictures of the earth in UV wavelengths between 1,050 and 1,550 angstroms. One photograph in the 1,230 to 1,550 angstrom range reveals three bands on the earth's night side. The southern auroras are well understood, and OGO 5 (the orbiting geophysical laboratory) data had predicted the equatorial band. "But no one understand the top band that intersects the equatorial band at about a 30-degree angle," says Thornton Page of MSC, co-investigator for the camera. □

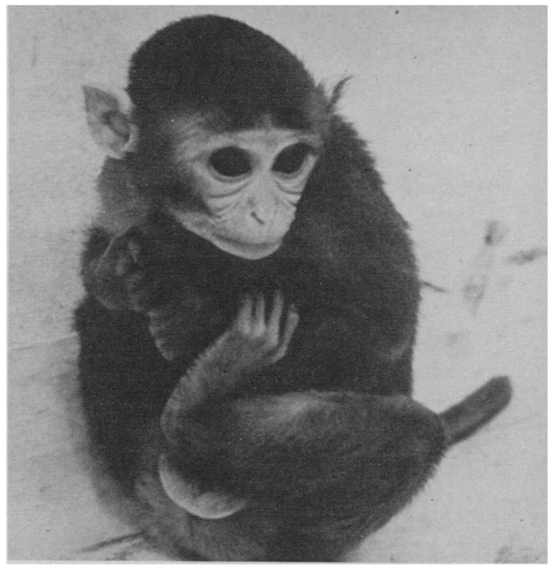
NASA

UV camera saw third earth band.

Chemotherapy for disturbed monkeys

When rhesus monkeys are reared in total or partial social isolation for the first 6 to 12 months of life, they develop severe, pervasive and persistant psychopathological behaviors, similar to those seen in autistic children. When removed from isolation and placed with equal-aged peers the monkeys exhibit behaviors characterized by rocking, self-clasping and mouthing, social withdrawal and aggression. Grooming and playing are minimal and there is little sexual response. Those who become mothers show inadequate maternal behavior, even brutality toward their infants. In monkeys these behaviors usually persist into adult life.

The condition was thought to be chronic and irreversible until last year when William T. McKinney Jr. of the University of Wisconsin Medical School and his associates at the University of Wisconsin Primate Laboratories in Madison reported that they had been successful in rehabilitating such animals (SN: 5/22/71, p. 356). When isolate monkeys were placed with peers they were attacked. But when they were placed with monkeys chronologically younger but at the same developmental stage as they, they were accepted and began to show signs of improvement.



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Isolate monkey before chemical cure.

Last week at the meeting of the American Psychiatric Association in Dallas, McKinney, Laurens D. Young and Stephen J. Suomi of the University of Wisconsin and John Davis of Vanderbilt University Medical School in Nashville reported that the improvement in these animals has persisted. They also reported successful rehabilitation of another group of isolates by treatment with a drug, chlorpromazine.

Four rhesus monkeys, three years old, had been subjected to parental isolation early in life and to other socially traumatic experiences. The animals exhibited the expected abnormal behaviors. Chlorpromazine was administered once daily for 12 weeks and then stopped. The animals appeared more relaxed and signs of behavioral disturbance decreased while on the drug. McKinney says this lessening of anxiety is not due just to the blunting effect of the drug. When administration began, he explains, the animals appeared to be sedated by the drug but they quickly developed tolerance to that side effect. They became active and began to engage in some social activities. Improvement continued during the post-drug period. In future tests other anti-anxiety drugs will be tested as well as a combination of chemical and social therapy.

The work needs to be repeated and confirmed, but McKinney believes the human implications are important. "Perhaps social isolation early in life produces certain biochemical alterations that can be reversed by drugs," he suggests. □