

The Lunar Lock-Up

The astronauts returning from the moon can look forward to three weeks confined to quarters.

In the past, astronauts returning from space have spent their first few days or weeks on the ground making personal appearances, accepting medals from the President and starring in ticker-tape parades. The first Americans to come back from the moon, however, will meet with slightly different treatment: they'll be shut away in a drab, gray building, and kept there for at least three weeks.

This is not as bleak a prospect as it might appear. The three astronauts will have their own housekeeper and cook sealed in with them, along with an exercise room, snack bar, offices and living quarters with a total area bigger than a football field. The scene of this benevolent incarceration will be the Lunar Receiving Laboratory, a sprawling, split-level structure now being built on almost two acres of ground at the Manned Spacecraft Center in Houston.

Actually the spacemen's isolation will begin before they ever get to Houston. Almost as soon as they have been safely retrieved from the ocean, they will enter a mobile isolation unit which will transport them in hermetically-sealed comfort to their quarters for the next 21-plus days. The crewmen will not be the first lunar representatives to reach the laboratory, however. Two vacuum-sealed boxes containing 80 pounds of rocks, dust and gas (if any) will beat the astronauts by several hours, along with the photographic film and magnetic data tapes from the spacecraft. The Apollo command module itself, the only part of the moon craft to return to earth, will also be sealed and sent to the receiving laboratory.

The lunar samples will actually get more special treatment than the astronauts. While both men and rocks will be quarantined to protect the public from "unlikely, but potentially harmful back-contamination" that might be brought back from the moon, the lunar samples must also be kept free of earthly bacteria, dust, gas traces and radiation that might mislead scientists involved in painstaking analyses.

Watching out for contamination in both directions has never been necessary before, according to the National Aeronautics and Space Administration, which is therefore having to develop its safety measures as it goes along. Aided by a team of Army experts from the most similar installation they could find, the bacteriological warfare center at Fort Detrick, Md., NASA has evolved

what one laboratory official has called the world's first "two-way bio-barrier," consisting of gas-tight glove cabinets and vacuum chambers. In addition, not only will the walls, floors and ceilings be completely sealed, but the air pressure in certain rooms will be kept slightly lower than normal so that if there are any undetected leaks, the air will flow in the desired direction. The air conditioning will be "single-passage": the air comes in one side, is filtered, goes out the other side, is filtered again, then is actually incinerated to remove any leftover impurities before reaching the exhaust. No one will breathe the same air twice.

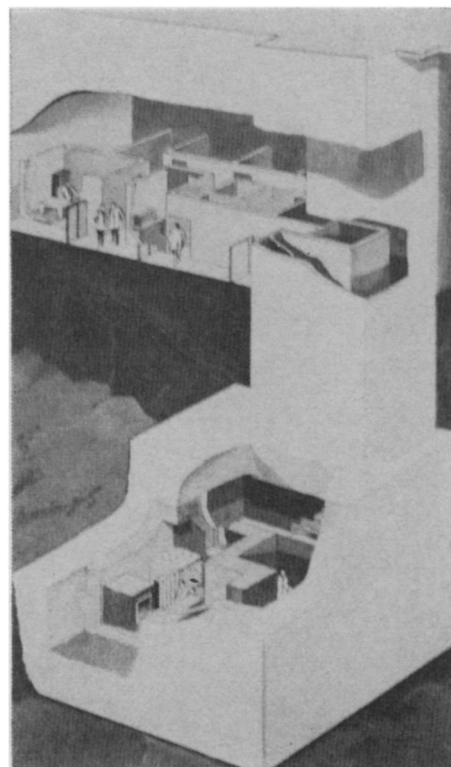
Even the films and tapes will be sterilized with ethylene oxide gas before anyone outside the bio-barrier gets to use them.

Many scientists believe that pieces of the moon, knocked loose by meteoroid impacts, are constantly arriving on earth as meteorites. "Yet," says a NASA official, "no forms of life are known to have arrived on earth in this manner. Nevertheless, the return of men and samples from the surface of a foreign celestial body entails some very small risk of back-contamination . . ."

The routine for incoming samples has already been roughly worked out: When a package arrives, its outer covering is unwrapped and its air-tight container, still sealed, is sterilized. The container is then placed in a high-vacuum chamber to be opened, so that any gases trapped inside when the box was sealed on the moon can be recaptured for analysis. Chips from each sample are re-vacuum-packed and routed to the Physical-Chemical Test Laboratory and the Biological Preparation Laboratory.

The biology laboratory could be the scene of the most momentous event in recorded history: the discovery of life from another world. NASA is pessimistic, however. Most of the work will consist of extracting "biologic" materials, if any, from the rock samples, and using them to inoculate earth plants, eggs, tissue cultures, amphibia and normal and germ-free animals to see what happens.

In the physics and chemistry departments, samples will first be exposed to atmospheric gases and water vapor to see if they deteriorate or change their mineral composition. This could greatly affect their subsequent handling. Microscopes, chemical reagents, spec-



Counting in the basement.

NASA

trographs and even hand tools will all be tried out on the lunar rocks.

The Lunar Receiving Laboratory has no basement, but one part of it is 50 feet below ground. The Radiation Counting Laboratory, shielded with three-foot granite walls and thick slabs of lead, will enable super-fine measurements of gamma rays being given off by the samples. This radiation will yield data on the history of the activating radiation that struck the rocks while they were on the moon, and may tell something about the moon's origin.

After about 30 days, some of the samples will be released to laboratories around the world. Many detailed investigations such as petrochemical studies will then be possible which could not have been carried out with the time and facilities permitted by the quarantine. Two experiments, however, the effluent-gas analysis and gamma radiation counting, will be what NASA calls "time-critical," which means that they must be carried out while the samples are fresh.

During those 30 days, hundreds of scientists in dozens of countries, already waiting with bated breath, will be getting sweaty palms in anticipation of putting their hands on a tiny piece of another world.