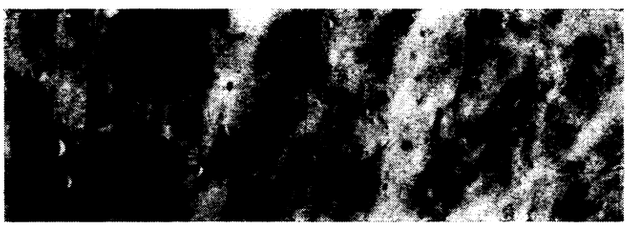
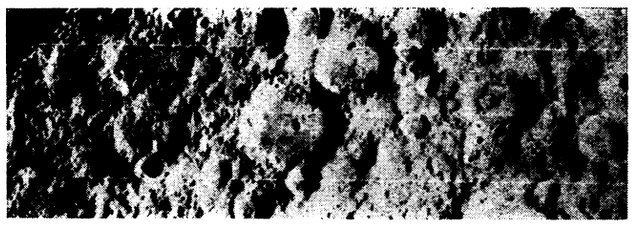
SELENOLOGY



NASA

The front face . . .



NASA

. . .and the far side

Man in the Moon Has Two Faces

The man in the moon, it seems, is two-faced, and his faces don't match. A photo of the moon's southern hemisphere, taken by Lunar Orbiter 2 from the lunar far side that is never seen from earth, has scientists buzzing about the moon's differing complexions.

Conspicuously absent from the photo is one of the moon's most famous features—the vast smooth plains called maria—that dominate the front side, and one of the strongest pieces of evidence cited by scientists who believe that there has been volcanic activity on the moon (see selenology, page 532).

The lunar south pole has been photographed before. In fact, the same area, back side and all, was included in pictures from the Soviet Lunik 3 probe before any spacecraft had photographed the front. The Orbiter picture is much clearer, however, revealing objects as much as 100 times smaller than did Lunik's.

Instead of level plains, the Orbiter picture shows an area covered with pits and pockmarks, in marked contrast to the opposite side of the planet. Several theories have been suggested to account for the difference, which was predicted even from Lunik's limited information.

One is that earth's mass has attracted the moon's center of gravity like a magnet, causing the volcanic material that may comprise the maria to appear mostly on the side facing earth. Another idea is that earth attracts meteorites from far out in space beyond the moon, causing them to collide with the moon's far side, which is in their way.

While they are still puzzling over this latest picture, the analysts will soon have another to play with. Soon after the south pole photo was received on earth, along came one of the north pole. This one is still being processed, and the scientists are anxiously waiting to see if it confirms the craggy far side.

PHARMACOLOGY

New Look for Penicillins

Two heads may be better than one, but two drugs often aren't.

There is "a fixed and mystic belief that if one antimicrobial agent is good, two must be better and three even more efficacious," a Los Angeles medical researcher told a gathering of 900 scientists in New York. Actually, he said, adding other drugs to one that already works may do more harm than good.

A pointed example is a synthetic penicillin called Ampicillin, which has been used to fight bacterial meningitis. In an attempt to boost its effectiveness, some researchers have combined it with two other drugs, chloramphenicol and streptomycin.

The Los Angeles team has found that the two drugs may actually be interfering with each other. When Ampicillin was used by itself, in fact, the mortality rate from bacterial meningitis was cut in half. The chances for survival of the critically ill patient may further be hurt by the toxic effects of chloramphenicol.

Ampicillin, which has been in use in this country for about two years, is one of a class of disease-fighters called broad-spectrum antibiotics. Of this group, the broad-spectrum penicillins are gaining acceptance as the best therapy for a growing list of bacterial illnesses. Among the promising candidates for defeat by Ampicillin are urinary, respiratory, middle-ear and surgical infections.

An investigator in San Diego took aim at still another microscopic enemy, and found that Ampicillin was better at curing typhoid carriers than any other antimicrobial agent in medical literature.

With Ampicillin already on the market and a related drug called Hetacillin now undergoing clinical tests, the possibility of another whole generation of penicillins was suggested to the scientists at the meeting.

John C. Sheehan, the Massachusetts Institute of Technology chemist who first synthesized penicillin, said that the new generation may come when chemists try to vary the core of the penicillin molecule.

Although the entire molecule can be made synthetically from off-the-shelf chemicals, its core or nucleus must presently be produced by natural biological fermentation. To this core, which is a complex ring structure, side chains, which may be either rings themselves or simple straight chains, are added.

The thousands of synthetic penicillins formed to date have been made by varying this ring structure. Dr. Sheehan told the conference that chemists are now so proficient at this that they have progressed from trial-and-error methods to "molecular engineering."

The next step, he said, and that from which a "super penicillin" could come, is to alter the ring structure of the core itself. Whether this is even possible, he said, is still unknown.

The conference chairman, Dr. William Kirby of Seattle, disagreed with Dr. Sheehan's estimate of the situation, calling it "oversimplified." While chemists may be able to synthesize compounds to kill specific organisms, he said, drug research is still an empirical process.