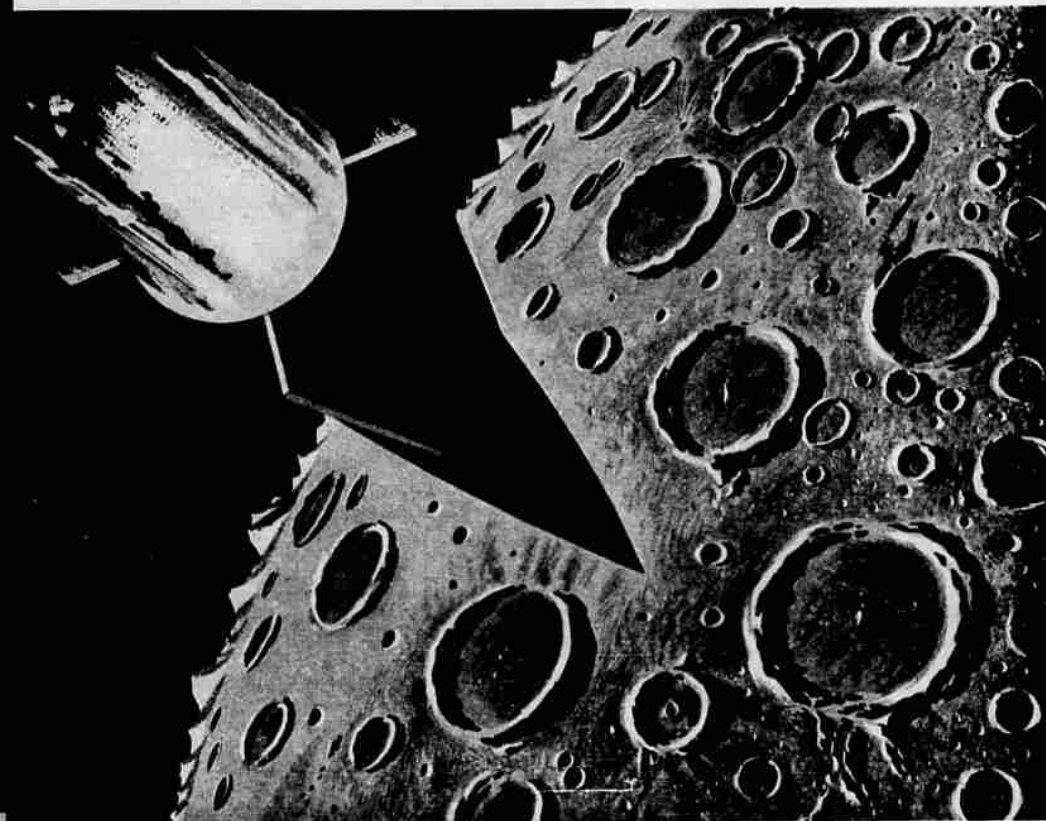


What Happens When We Reach the Moon?



Convinced that this epoch-making flight will be made within ten years, a space expert discusses the problems man will face in landing there.



When man reaches the moon, he'll find:

- 212° heat
- 240° cold
- No atmosphere
- No oxygen
- No water
- No food
- No weather
- No wind
- No noise
- No protection from bombardment by meteorites or radioactive stardust

Art by Jim Tesson

THERE REALLY is going to be a man in the moon. In fact, there are going to be quite a few.

Just as surely as you are reading this, you will be reading soon—within a few short years—of man reaching the moon. It could happen in five years. It will surely happen in ten.

There are still some tough problems to lick—rocket propulsion, missile guidance—but they are technical matters in which constant progress is being made and which will be solved. We have reached the stage now to plan for man after he gets to the moon.

The great challenge confronting us is not so much how to get to the moon but how to accommodate ourselves to our satellite when we reach it. The moon is not going to be too hospitable. In fact, it would be hard to imagine a more sullen, dismal, bleak, uninviting piece of territory.

In the first place, when man gets there he may find a searing, blistering 212-degree temperature—it would be like stepping into an oven. Or he could find that the temperature is down to 240 degrees below zero, making the weather in the Arctic and Antarctic seem like Miami Beach.

And, with no atmosphere encircling the moon to exert a temporizing and restraining influence, the temperatures on the moon continually fluctuate from one extreme to the other. It's as if the moon were a piece of steel and the sun the forge. When the sun is shining upon the moon—a period of

about two weeks—then the moon is at a white-hot pitch. But when the face of the moon is away from the sun—also about two weeks—then the satellite becomes as frigidly and inhumanly cold as cold steel.

Undoubtedly, there is some sort of transition period from extreme hot to extreme cold and then back again in which temperatures more typical of earth are approximated. Chances are, such periods would be quite brief—perhaps only a matter of hours—but even if man could arrive on the moon during this period it would be small consolation for him.

He wouldn't be able to just step out of his rocket ship, even if it were a pleasantly balmy 80 degrees outside. For one thing, the sun's rays hit the moon directly, without any softening and diffusing process, as on earth. So everything about the moon may be affected by cosmic radiation and extremely harmful to man.

Even if this weren't so, man wouldn't find much of a welcome or anything conducive to his well-being. There is no air on the moon, no semblance of oxygen. He couldn't breathe. In other words, the plain fact is that man cannot live in the moon's environment. In order to stay on the moon, he must bring along his own environment from earth. Before he can step out of his space ship, man will have to wear a helmet containing the oxygen he needs to breathe.

Everything else that man needs to



by Maj. Patrick Powers

A scientist-soldier, the author came by his calling naturally. His father, now retired, was a colonel in the Army chemical corps. Major Powers, a West Pointer, studied aerodynamics and missile theory at the University of Southern California. He is currently assigned to the Pentagon with the research and development command, the Army's missile unit.

sustain him will also have to come from the earth—his food, his shelter. The moon is so barren it doesn't even have any water. That will also have to be supplied from earth.

JUST AS IT is very difficult for man to picture infinity, the concept of space without end, so is it hard to conceive of the utter bleakness and desolation of the moon. It couldn't sustain life in a single blade of grass. It's a dead world, so bereft of even the most elemental influences on the earth that there are no such things as different seasons there. There isn't even any weather on the moon!

There are no clouds, no rain, no wind, no erosion. Except that it runs hot or cold, it's a place of complete sterility. It doesn't even have much gravity to speak of. A man who weighed 200 pounds on earth would

weigh only 34 while on the moon.

There isn't any noise on the moon, at least nothing transmittable. One wouldn't hear sounds on the moon because there aren't any air waves to transmit the sounds. You couldn't carry on a conversation on the moon. You couldn't hear a person talk—you would just see his lips move.

Yet man will not only go to the moon but inhabit it. It is important that he do so, for the moon is a very valuable piece of real estate. But in order for man to be able to "take over" the moon, it's possible that a "new breed" of man will have to be cultivated on earth.

With its weightlessness, its soundlessness, its utter forlorn state of being, the moon is so different from anything on earth that the people selected to go to it will have to be isolated at a fairly early age, say in their teen

or early 20s. They will have to be brought up in conditions simulating the moon so they may be able someday to become a part of the satellite.

There seems to be a popular assumption that, because of the size factor, a midget may be the first person to get to the moon. This is most unlikely. In the first place, when a manned space ship is able to reach the moon, it will be carrying so much equipment—instruments and supplies—that the difference in space needed for a midget or a full-grown person will be inconsequential.

But more important, you couldn't just pick anyone at random to go to the moon. The person chosen will have to be levelheaded, courageous, dedicated. He'd also have to be a superbly trained technician. In fact, it is difficult to avoid the conclusion that the pioneer people to explore the moon should be scientist-soldiers, skilled, disciplined, and brave.

You hear talk that perhaps, because of size and temperamental factors, a woman may be the first person to go to the moon. There is probably a note of facetiousness to this—but it might not be a bad idea.

I don't mean a woman going up there alone. I wouldn't advocate anyone's going up there alone—it might be too terrifying. But I think there's a good possibility that a married couple—a science team—might actually be among the first persons sent to the moon. If the space ship could

be made big enough, perhaps several such couples could go.

There are several things that make reaching the moon important. One is that it undoubtedly would make an excellent observation post. Another is that there is a good chance valuable minerals will be found there—uranium, for example. And the moon will make an excellent stopover place for further cosmic exploration.

BUT MOST important, we really don't know what going up there may lead to. It could give us an entirely new concept of the solar system, revising much of our scientific thinking. From the vantage point of the moon, many things about cosmic matter that is blurred now could become significant and revealing. It could place at our disposal much new knowledge.

So it's indispensable, no matter how you view it, that the people who go to the moon must be able to handle scientific instruments and know how to interpret the phenomena about them. Furthermore, they'll have to know how to handle their space ship. Almost certainly, the actual landing of the rocket on the moon will have to be done by the people on the ship rather than by remote control from earth. Among other things, these people probably will have to know how to fire retro-rockets. These fire in the direction the space ship's heading to produce a counter-momentum to slow it down. And these space-ship

people also will have to know when to bring these counter-rockets into play, how to handle any moon orbiting, and finally, how to land.

Then there's the matter of getting the space ship back to earth.

Theoretically, that should be easier than getting to the moon. It is calculated it will take only a mile-and-a-half-per-second velocity to get a space ship off the moon—compared to seven-miles-per-second thrust to get the same vehicle off the earth. There's relatively little gravity to contend with in taking off from the moon and, on approaching the earth, gravity would pull the ship down.

These space pioneers would still have to have some understanding of rocketry and space travel—even if everything went smoothly. And you always have to consider that it might not. Suppose the space ship is damaged in its moon landing, or by meteorites as it travels through space. How are these people going to get their space ship into proper shape again unless they're good technicians?

But courage is likely to be just as indispensable, since there are some dangers I haven't mentioned yet. For one thing, the moon is probably bombarded by meteorite particles. The earth is, too, but our atmosphere acts as a shield and mitigates the effect. Although some 3,000 tons of this stuff falls on the earth daily, few of us are ever aware of it.

But on the moon it would be differ-

ent. The pelting of the meteorites would be direct—and troublesome. At times it could be something like a hurricane-whipped sandstorm.

But perhaps the biggest danger on the moon is star dust, an acute life-and-death problem. Star dust—dust from outer space—filters down on earth, too, but is absorbed in the natural process of weather change and erosion. On the moon all it can do is accumulate, layer upon layer.

In other words, it is possible that the moon is a vast dust bowl. This dust, at least in some areas, may be hundreds of feet deep. Thus, man will have to bring down his space ship with a great deal of care, just as he'll have to move about cautiously. The best landing spot probably would be a big smooth volcanic surface near a small crater.

If it is true that the moon is radioactive, then there's a likelihood that gaseous by-products of radioactive decay—argon, krypton, and xenon—may envelope it. These inert gases are conducive to electromagnetic impulses and may be responsible for some form of life that can exist without earth air.

Something that also has to be borne in mind is this: the earth is almost certainly not the only inhabited planet in our galaxy. Some other planets may have succeeded in establishing their form of life on the moon. Or there may be life on other cosmic bodies that would resent our intrusion on the moon and move to force

(Continued)