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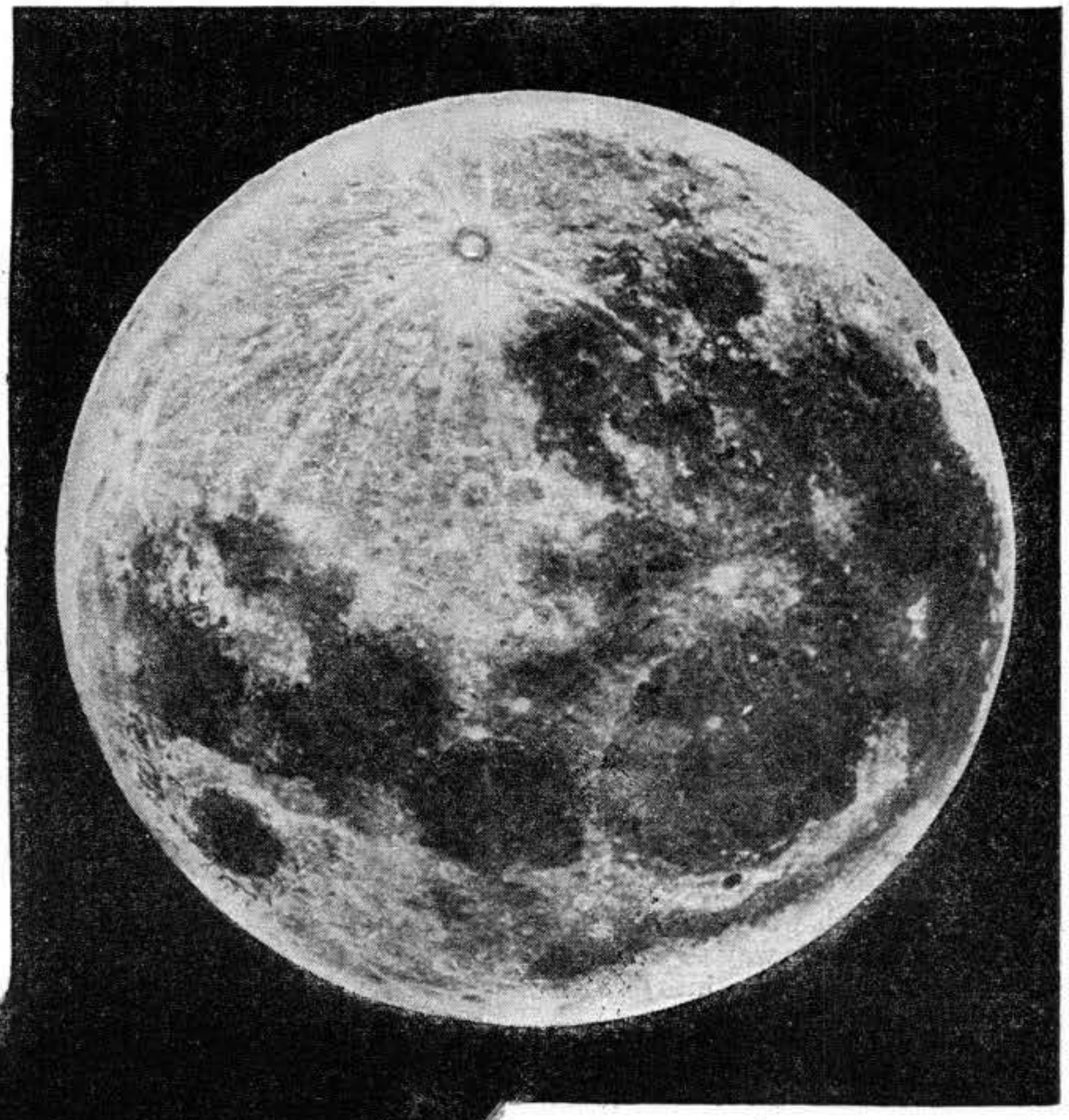
A Rocket to the Moon

By F. Gregory Hartswick

IF THE proposed transpolar flight by airship is completed successfully, almost the last unexplored region of the earth will have been charted and mapped. In the restless wanderings of man over this globe only a few square miles have been left untrodden. The eternal spirit of "something lost behind the ranges" has driven men from time immemorial to seek what lies in the unknown regions.

And now the earth's last hidden territory to the north is about to yield its secrets. Where will the restless force of adventure drive man next?

There is a territory not far away, as distances go in space—a territory explored by the eye of man, mapped, named, and described—a territory that, through the powerful eye of the modern telescope, has been brought to within a theoretical distance of 50 miles and yet which, up to the present moment, never has been reached by man. It is the earth's satellite—the moon. Toward this land



Years ago Jules Verne told of a hollow cannon ball that carried passengers from the earth to the moon. More recently Professor H. Oberth, of Rumania, suggested the possibility of a passenger-carrying rocket, such as our artist has visualized on this page. Far less imposing and fantastic is Professor Goddard's moon rocket, described in the accompanying article; yet his invention at least is based on a hypothesis of scientific practicability and so has compelled the attention of scientists. Who knows but that his modest attempt to photograph the blazing trail of a missile shot through the vault of heaven may be a pathfinder for future achievements in interworld communication?

the eye of the scientist and explorer has been turning hungrily. And today their indomitable spirit, in the person of Professor R. H. Goddard, of Clark University, Worcester, Mass., plans to hurl into space a rocket that will bridge the 240,000-mile gap separating us from our nearest heavenly neighbor. He plans to make his experiment early in the coming summer.

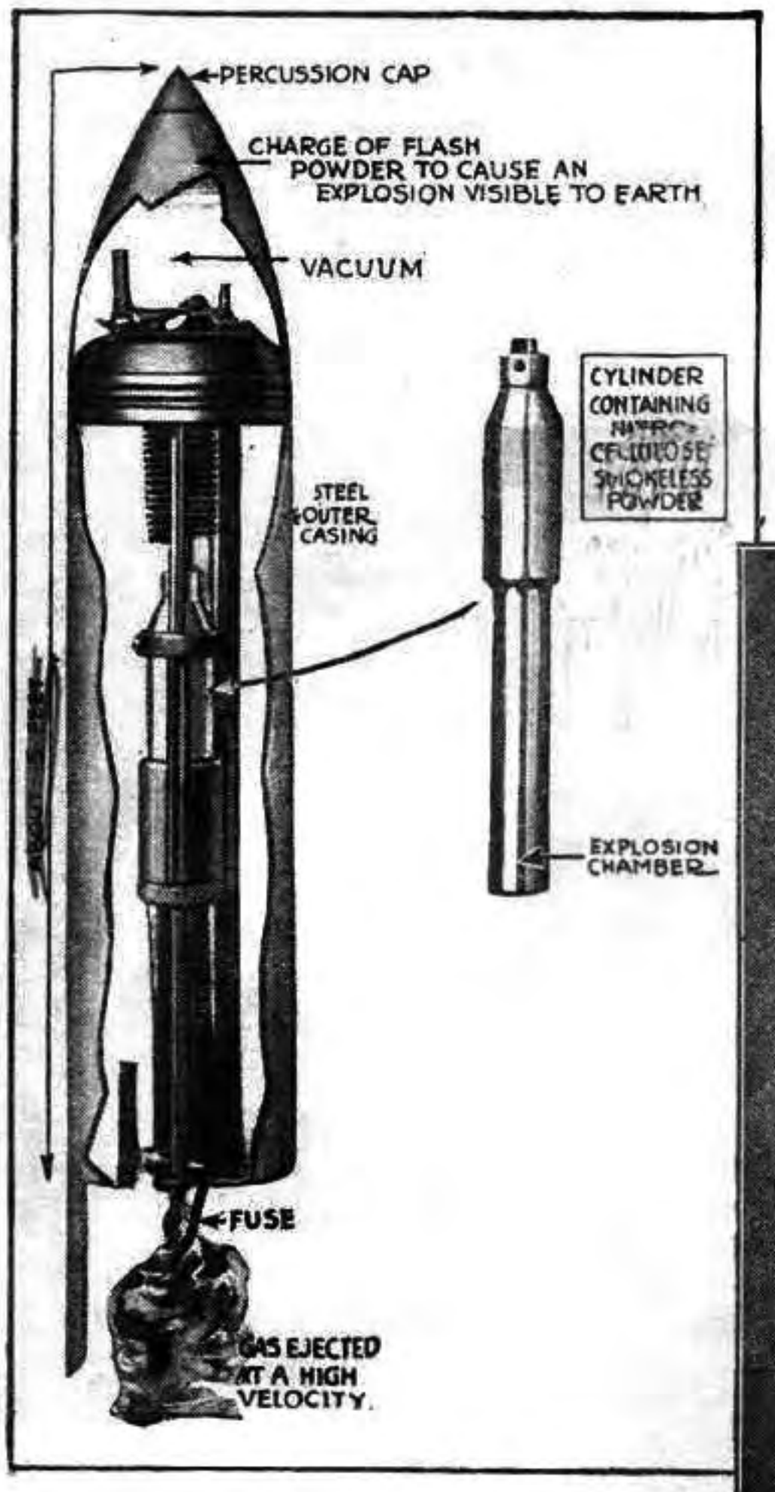
Man, in his own mind, has been traveling to the moon ever since the tellers of tales realized that the ideal field for romance lay in the lunar satellite. All a writer had to do was to invent a suitably plausible method of reaching the moon, and, presto! His hero was safe where the most violently impossible things could happen.

Rostand's immortal *Cyrano de Bergerac* made the trip, according to his own account, by sitting on a piece of iron and throwing a magnet into the air. "The magnet thrown," says the gallant Gascon,

> Infallibly the iron must pursue;
> Then, quick! Relaunch your magnet, and you mount
> Unmeasured distances!

The good *Cyrano's* plan is not to be recommended to possible lunar explorers.

Edgar Allan Poe's *Hans Pfaal* made a successful journey to the moon in a balloon filled with a gas, the



formula of which was a dark secret. He found air all the way to the moon—thin but condensible into breathable atmosphere.

Jules Verne sent his heroes flying from the earth in a huge projectile fired from a cannon. H. G. Wells invented a substance called "cavorite," which acted as an insulator to the force of gravity. Standing on a plate of cavorite, you immediately shot off into space at a tangent to the earth, impelled by centrifugal force.

Thus have novelists described their fanciful flights to the moon. But as is so frequently the case with novelists, even the most imaginative have not nearly approached the mark set by practical inventors. In fact, the fictioneer overlooked the most obvious method of shooting a projectile into space. The Fourth of July rocket was to be seen on every hand, yet none thought of it till Professor Goddard, an unassuming university lecturer with no literary leanings, calmly announced that he had perfected a rocket with which he hoped to score a bull's-eye square in the middle of the lunar countenance.

More than Six Miles a Second

Professor Goddard has given his rocket an initial propelling charge of terrific force, sufficient to generate a speed of 6.6 miles a second, or enough, he says, to hurl the rocket out of the field of the earth's gravity.

To keep the rocket going, he has provided a series of successive charges that, exploding in space, by their reaction drive the rocket ahead. Free of the earth's pull, the rocket will continue till the propelling charges are exhausted—a time long enough, Professor Goddard believes, to bring it well within the gravitational sphere of the moon. Gravitation will do the rest, he says, and the rocket will fall headlong into the midst of the lunar world.

The explosive charge first used by Professor Goddard in his rocket experiments was smokeless powder; but he has recently perfected a method of burning liquid in an atmosphere of pure oxygen, a process said to generate an expansive force many times greater than the original charge.

Professor Robert H. Goddard, head of the Department of Physics at Clark University, Worcester, Mass., demonstrating his high-speed rocket that he hopes to shoot to the moon this coming summer. Construction of the rocket is shown in the diagram

Nor will the Goddard rocket, if it arrives on the moon, be unseen by earthlings. Its course will be carefully plotted and mapped in advance, and the spot of its ultimate arrival calculated with the utmost nicety. Powerful telescopes will be trained on that spot. In the head of the rocket will be placed a heavy charge of flashlight powder with a contact fuse. The flash of impact should be seen from earth, the inventor believes. And his assumption would seem to be reasonable when we consider that the Woolworth Building, if it were on the moon, could be distinguished by our astronomers' most powerful telescopes.

If successful, the Goddard rocket may mark the beginning of an epoch of interplanetary communication. Such a possibility naturally leads to the question, "Is there life on the moon?"

Concerning this subject dispute has long raged. It must be admitted that the advantage of argument lies with the school that holds that the moon has no atmosphere, therefore no life. The shadows cast on the moon are sharp and hard, not dulled as they would be by an atmosphere. In all telescopic investigations nothing has been discovered to indicate any organized life activities. On the other hand, Professor W. H. Pickering, noted American astronomer, thinks that there are distinct signs of volcanic activity on the moon's surface. He also believes that he has detected a thin atmosphere—even an occasional light fall of snow. There must be a moisture-retaining soil, he thinks, and life may exist under the most trying conditions.

The temperature of the moon is also a moot point. The practical absence of atmosphere would allow the direct penetration of the sun's rays; but it also would allow direct radiation. The moon may be, during its 14-day "day," either well above the boiling-point or far below freezing.

It would be necessary for the hardy explorer of the heavens who may follow the wake of the first experimental moon rocket to be well protected against extremes of heat and cold. As for air, Professor Goddard says: "That is a problem similar to that of the submarine." He points out that if man can live for a long period under water, he could exist, at least temporarily, in a partial vacuum; and if his clothes were of sufficiently high insulating quality, he could easily endure the moon's possible sharp changes of temperature.

Is There Life on the Moon?

And what life, if any, would the explorer find on the moon? Once more speculation enters. Professor Pickering thinks that life on the moon is probably of a low form of vegetation, existing in hollows where the atmosphere is heaviest. Professor Goddard himself disposes of the theories of many romancers concerning inhabitants of the moon by saying, "I don't believe that, under the physical conditions of the moon as we know them, the form of life would be higher than ours." And there remains the fact that at no time has there been evidence of activities at all approaching those of our own planet. If there were cities, we should see them.

Yet there is another possibility, hinted at by H. G. Wells—the possibility of a life carried on in vast caverns beneath the moon surface, where the atmosphere would collect in its densest form and where the bitter cold or suffocating heat would be tempered to a bearable degree.

What sort of creatures might be found there? Certainly their life would be far different from ours; for the gravitation of the moon is far less than ours. We could lift enormous weights on the moon, leap 40 feet at a stride, jump 10 or 20 feet into the air. The moon's inhabitants, if such exist, would have excessively developed lungs to live in rarefied atmosphere; their ears would have to be large and sensitive to distinguish sound vibrations transmitted through the thin air. Indeed, they might have devised some system of communication that makes no use of sound—signs, perhaps, or a tactile sense highly developed, as is the case with the ants, or some intricate human radio.

All this, of course, is entirely in the realm of fantasy. But if Goddard's rocket is successful, before long fantasy may be replaced with scientific facts.