ROCKETS AND MISSILES

Moon May Be Exploded

➤ THE FIRST rocket to the moon may trigger a gigantic explosion of powerful lunar chemicals.

The first exploratory missile to hit the moon may obliterate itself and a part of the moon's surface in a major explosion, a noted physicist reports.

Even if a space ship could manage to land without triggering a violent reaction, there is a good chance that the first spaceman might cause an explosion when he sets foot on moon dust that may be so chemically unstable that its slightest contact with a foreign substance will cause it to react with explosive force.

That is the view of Prof. John R. Platt, department of physics, University of Chicago, who believes the otherwise barren surface of the moon is coated with a highly reactive cosmic "dust" consisting in large part of unstable free chemical radicals, frozen out of action against the moon's extremely cold surface. These "unfinished compounds" probably are formed from carbon, nitrogen and oxygen.

He supports his report in *Science* (June 27) with references to recent work of five authorities on the chemistry and physics of outer space whose published views of the moon's make-up are similar to his own.

Prof. Platt called for a program of study, to be conducted in earth laboratories, that would determine accurately the composition of the moon's surface.

Such information is needed, he said, so we can devise "a number of precautions for early moon missiles."

"The first man who plants a rubber boot on a lunar surface may be in for an unpleasant surprise," he said, adding "surfaces of such a chemically unstable character" could be extremely reactive and extensive heat-liberating explosions "might be easily triggered."

The "intersteller dust particles" that Dr. Platt believes coat the moon are free radicals, unstable molecular fragments eager to react violently with other materials to complete stable molecular structures.

A foreign substance, such as rubber on a boot heel or plastics on a missile, could easily trigger the reaction just as rubber and other organic substances set off explosions when merely touched to unstable rocket fuels and oxidizers.

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TECHNOLOGY

"Buck Rogers" Coming

➤ MAN SOON will be flying free as a bird, with the aid of nothing more than small rockets strapped to him.

That is a major goal of "project grasshopper" which recently resulted in a demonstration of the Buck Rogers personal rocket.

The goal can be achieved in about two years from the time the Army states a requirement for the unique rocket and lets a contract for its formal development, Harry W. Burdett Jr., head of the advanced design group at Reaction Motors Division of Thiokol Chemical Corporation, Denville, N. J., told SCIENCE SERVICE.

Army officials said they are "evaluating" existing and planned models of the Buck Rogers which Mr. Burdett said already permitted even non-athletic soldiers to run faster, jump higher and farther than the greatest athletes the world has even known.

Besides greater combat mobility, the "ultimate" Buck Rogers also will provide personal transportation up to several miles. It is possible that the rocket may even permit scouts to fly over enemy territory, spot installations and movements and return with a report.

Since it is hoped to make the device small, light, cheap and simple enough for general issue to all troops, the engineers believe the Buck Rogers may even find applications in a civilian market.

Alexander H. Bohr, Reaction Motors project engineer who actually put into practice a concept originated in 1940 by Lt. Col. Charles M. Parkin Jr., Army Corps of Engineers, said new models soon will be revealed which operate on rocket fuels rather than by compressed gases.

The device revealed by action films to the Infantry Board May 29 at Fort Benning, Ga., consisted of a waist belt and harness to which were attached several small canisters of compressed nitrogen and two exhaust jets or nozzles.

The model permitted a soldier to run for several seconds at 35 miles per hour without tiring and jump about six feet vertically.

The engineers said their immediate goal is to utilize chemical fuels in a Buck Rogers device that permits a man to run faster, longer and jump higher and farther. It would give infantry troops greater combat mobility.

The ultimate goal, which the engineers are confident can be accomplished with about two years' work, is to make the device a "true flying belt just like that worn by the comic strip character."

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PSYCHIATRY

Find Mental Disturbance In Very Young Infants

➤ SIGNS OF mental disturbance have been observed in infants as young as six weeks of age.

But for reliable information about such early abnormalities the doctor cannot depend entirely on reports from the mother, Dr. Sylvia Brody of Lenox Hill Hospital, New York, says in a report to the *American Journal of Orthopsychiatry* (April).

Two infants showing such signs of mental disturbance are described by Dr. Brody. Because the unusual behavior was observed so early and proper handling instituted right away, the infants recovered.

One of the babies wanted to sleep too much, the other stayed awake and cried all day long.

The first baby, six weeks old, had a mother who was so quiet that she actually was lulling the baby to sleep with her gentleness. The baby would go to sleep instead of nursing even though the mother jiggled him and slapped his feet.

The mother in this case was instructed to look at the baby's face more and to talk to him or sing when he was about to nurse. Within two days normal feeding was restored.

In the case of the other infant, a three-month-old, the mother was too anxious about him, picking him up and holding him or rocking him every time he whimpered.

This mother was instructed to stabilize her own routine and little by little to accustom the baby to lying quiet in his crib. This baby's behavior also changed. It took a few weeks before he could sleep quietly through a whole night and could be alone for intervals during the day.

"I believe," Dr. Brody commented, "that the number of such small and early problems that occur, and go untreated, and grow worse as they get enmeshed with subsequent developmental conflicts, is very great."

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ENGINEERING

Frenchman Combines Diesel With Turbine

➤ A COMBINATION diesel and gas turbine engine was reported at the oil and gas power conference of the American Society of Mechanical Engineers meeting in Philadelphia, by Auguste F. Moiroux, of La Societe, L'Etudes Mecaniques et Energetiques of Paris.

Mr. Moiroux described the latest French development as a "free piston gasifier," in which diesel fuel is burned in a cylinder and the resulting energy drives opposed reciprocating free pistons. The pistons, in turn generate compressed air which drives a gas turbine.

The principal advantage claimed is the ability of the device to use low-grade fuels more efficiently because of the high compression ratio of the diesel system.

Mr. Moiroux predicted this could lead to the more economical use of petroleum resources and better utilization of existing engineering know-how. He also asserted the problems involved in the building of such engines have already been worked out by diesel designers.

The term "free-piston" describes a system wherein there is no direct connection with the drive shaft.

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