PHYSICS-ASTRONOMY

Atomic Powered Rockets

Atomic energy may speed the earth's man-made moonlet so that it gets far enough out into space to offset the pull of gravity.

➤ ATOMIC POWER may solve the problem of getting a rocket far enough out into space to offset the pull of earth's gravity by the centrifugal force of its endless five-miles-a-second circling. This suggestion is offered in *Army Ordnance* (Nov.-Dec.), by E. M. Rogers, well-known writer on military and technical subjects.

Five miles a second is at present an impossible speed, Mr. Rogers admits, but he declares that in a relatively few years it will be attained. The rocket destined to be earth's man-made moonlet could not be sent up through the air at that speed, however, or it would melt itself by air friction like a meteor in reverse. Propulsion would have to be so designed as to send the missile up at a relatively low speed until it got beyond the earth's relatively thin envelope of air.

At 200 miles up, atmospheric friction ceases to be a practical problem. At that level, the rocket motors could be turned on full speed ahead until the five-miles-a-second velocity was reached. It would not matter, after that, how soon the fuel ran out. In the absence of friction, the rocket would keep on circling around the earth forever at the same speed.

A big rocket can be seen with telescopes at 200 miles, even without its fiery tail; it is also possible to track it with radar. Instruments in the circling satellite could send down continuous reports on cosmic and other radiations, magnetic storms from outer space, drifting particles of interplanetary debris, stray plant spores and other matters of scientific usefulness.

If it should ever become possible to put a human crew on such a satellite, their lives would be rugged ones. Cramped for space and breathing rationed oxygen, they would have to protect themselves by night against the absolute zero of cold (459 degrees below zero Fahrenheit), and by day fend off the blazing heat of the sun, besides unquenched ultraviolet radiation, possibly unknown types of cosmic rays, and the ever-present risk of a direct hit by a hurtling meteorite. A berth on a lightship, or a job in an Antarctic weather observatory, would be downright Persian luxury compared with the task of a "satellite sitter."

Science News Letter, December 7, 1946

CHEMISTRY

Carbon 14 Research Starts

Radioactive carbon can be traced in living tissue, giving valuable information about body chemistry. Nation-wide distribution of this tool has begun.

➤ BASIC RESEARCH which may some day lead to an understanding of the fundamentals of life itself have started with radioactive carbon isotope 14 at the University of California.

Four shipments of the precious research tool produced in the atomic piles of the Monsanto-operated Clinton Laboratory of the Manhattan Engineer District at Oak Ridge, Tenn., were received there, the first to arrive under a nation-wide distribution plan.

Laboratory work in many fields was started immediately. Described as the most promising tool for unfolding the elementary processes of living things, radioactive carbon can be traced in tissues and chemical substances by means of its radiations.

With researchers all over the nation receiving the substance in relative quantity from the atomic pile, biological scientists await with keen anticipation the first results of work with radioactive carbon.

Dr. D. M. Greenberg, professor of biochemistry, will use the radioactive carbon he received to study heretofore hidden mechanisms involved in the synthesis and breakdown of proteins, the basic building blocks of living tissue. Dr. Greenberg will try to determine how both normal and abnormal cells grow, striking at the heart of the cancer problem.

Dr. A. P. Krueger, professor of biochemistry, will use the millicurie of radioactive carbon he received in his study of the airborne transmission of respiratory diseases.

Dr. I. Chaikoff, professor of physiology, will investigate what happens to the fat molecule in the body, by labeling it with radioactive carbon. The fat molecule is intimately tied in with basic problems of metabolism.

Dr. William Dauben, instructor in chemistry, will use his shipment of radioactive carbon to study the metabolism in the body of anti-malarial pharmaceuticals developed during the war.

Science News Letter, December 7, 1946

NUCLEAR PHYSICS

Rare Radioactive Gas Generated from Atom Bomb

➤ A NEW and rare radioactive gas was generated by the second atomic bomb at Bikini and was detected in the atmosphere over Oklahoma three days later.

This is the conclusion presented in a report to the *Physical Review,* journal of the American Physical Society, by a group of five Tulsa scientists, R. E. Fearson, A. Wendell Engle, Jean Thayer, Gilbert Swift and Irving Johnson.

Radioactive concentrates were prepared from the atmosphere and radioactive decay constants were determined. The scientists concluded that the deposit obtained July 28 consisted of element 86 with a half life of 82 minutes. Element 86 is radon, a radioactive gas which is known as the first disintegration product of radium. The kind of radon found by the Tulsa scientists would be a different variety or isotope from the one obtained from radium and may be in an unreported radioactive series.

There has been apprehension that atomic bomb fission products would float around the world, polluting the air. Scientists in many places set up experiments to detect atmospheric effects, but negative results were obtained in most places. A marked increase in gamma rays was reported from Houston, Texas, on July 4 and linked with the first explosion at Bikini July 1.

Science News Letter, December 7, 1946