



**MIRAGE MAKER**—A 20-foot plank covered with fine, white sand, small cut-out figures, milky glass and jet burners to heat the plank can be combined, as shown here, to make mirages in the laboratory.

## OPTICS

## Optical Laboratory Pictures Desert Mirage

See Front Cover

► THE DESERT lake pictured on the front cover of this week's SCIENCE NEWS LETTER is an actual mirage, although the photograph was made in a laboratory, not in the middle of the Sahara Desert.

It was taken in the laboratory of the Institute of Optics of the University of Rochester, Rochester, N. Y. To make the mirage, Mrs. Norma Miller, a graduate assistant, cut out half-inch cardboard figures and placed them at one end of a 20-foot aluminum plank covered with fine, white sand. Milky glass was used to provide the desert sky, while the desert heat came from jet burners along the pipe beneath the plank, as shown in the picture on this page.

The mirage of a desert lake, complete with reflections and ripples, was photographed with the camera in the observer's position.

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## PHYSICS

## Universe Not Older Than 5 Billion Years

► ALL THE matter in the universe is no older than five billion years, Dr. Edward McCrady, president of the University of the South, told the southwest regional meeting of the American Chemical Society.

Dr. McCrady based his theory on the known facts of radioactive decay of uranium. Radioactivity in U-235, a uranium isotope, causes constant decay of particles of the element, ending eventually in a lead isotope, Pb-207. The time necessary for complete decomposition of U-235 into Pb-207 is known to be about five billion years.

According to one idea of the formation of matter, the Gamow-Alpher theory, all the elements of the universe came into being almost simultaneously—probably within a single half-hour. These elements were formed from the rapid decay of absolutely compressed neutron gas, the result of sudden tremendous expansion and cooling of the neutron gas.

One-half hour after this explosive expansion, all matter as we know it today is believed to have been formed.

Dr. McCrady said that since all elements were created at the same time, then U-235 must have been present at creation. As U-235 changes completely to Pb-207 within five billion years, Dr. McCrady said, then U-235 cannot be older than that. And so it follows, neither can any other element be older than five billion years.

Dr. George Gamow, one of the creators of the Gamow-Alpher theory, estimated the universe to be between one and three billion years old in 1950. Later, some rocks dated by radioactivity proved to be about three and a half billion years old.

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## MEDICINE

## Emotional Stress Disease

► A DISEASE that mimics polycythemia, a rare affliction of the blood, has been discovered by two University of California scientists.

The disease has been named "relative polycythemia" by its discoverers, Drs. John H. Lawrence and N. I. Berlin. It is apparently a psychosomatic affliction, caused by emotional stress.

In true polycythemia the bone marrow apparently manufactures too many red blood cells. The red blood cell count and the hemoglobin count shoot up.

In the course of 15 years' study of the disease, Dr. Lawrence and his colleagues recently have made two expeditions to Peru to study a physical condition resembling polycythemia and which occurs in natives living at extremely high altitudes in the Andes.

They found that experimental subjects who went along on the expeditions rapidly developed at high altitude an apparent polycythemia due to loss of plasma from the blood. On return to sea level, the blood picture returned to normal. It appeared, therefore, that the stress of high altitude on the body could cause a simulated polycythemia.

In 18 out of 215 patients who were diagnosed as probably having polycythemia, a similar picture was found by Dr. Lawrence and his colleagues. These patients had apparent high red cell and hemoglobin counts. But investigation showed the total number of red cells in the blood was normal.

The reason: due to loss of plasma, the total quantity of blood in the body was

below normal. So when a blood analysis was made, high red cell and hemoglobin counts showed up. The counts were high relative to the quantity of blood in the body.

The scientists said some of the 18 patients with this "relative polycythemia" clearly showed severe emotional stress in their backgrounds. They said radiation, designed to reduce the red cell count in true polycythemia, is no good for "polycythemia of stress." These patients need treatment for their emotional problems primarily.

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## TECHNOLOGY

## Flashing Lights Warn Of Traffic Change

► FLASHING LIGHTS spotted 500 feet from street intersections in Portland, Ore., have cut traffic accidents sharply by warning motorists that the traffic light ahead says to "stop."

Synchronized with the traffic light at the intersection, the flasher begins blinking its warning seven seconds before the traffic light turns yellow. It continues to blink until five seconds before the traffic light turns green. A nearby sign warns motorists to be ready to stop if the flasher is working.

Only two rear-end collisions occurred in the southbound traffic lane of one road, which was equipped with the warning flasher. But 33 occurred during the same period on the road's northbound lane, not equipped with the blinking light.

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