SCIENCE IN THE NEWS

Rocket Ship

■ SPEAKING BEFORE THE American Rocket Society in New York last month Dr. Hsui-shen Tsien, Caltech's Goddard Professor of Jet Propulsion, startled his avant-garde audience with the announcement that transcontinental rocket ships were a lot closer than most engineers suspected. "The requirements," he explained, "are not at all beyond the grasp of present-day technology."

Specifically, Dr. Tsien enumerated some of the requirements for a rocket-liner capable of nearly 10,000 miles an hour which would fly from San Francisco to New York in less than an hour. It would be shaped like a pencil, about 80 feet long and 9 feet in diameter. It would have a pair of small wings set midway between the nose and the tail, with tail fins of about the same size and a vertical tail fin slightly larger.

At takeoff it would weigh about 50 tons, of which 37 would be fuel load. Fuel would be a combination of either liquid oxygen and liquid hydrogen or liquid fluorine and liquid hydrogen. It would be out of sight in a matter of seconds after takeoff and would not be visible again until just before landing. It would travel the first 1,200 miles as a rocket and then glide for 1,800 miles. The highest altitude it would reach on the flight would be 300 miles, and the top speed would be 9,140 mph. Landing speed would be slowed down to 150 mph.

The ships have been in blueprint design for some time, according to Dr. Tsien, and both the Army and Navy are experimenting with designs of a rocket vehicle that might some day carry passengers.

Shock Symposium

■ UNTIL SCIENCE finds a way to protect the human body from the exaggerated forces involved in rocket travel, however, not many people are likely to become coast-to-coast rocket commuters.

Nevertheless, this was one of the topics under discussion at a Shock and Vibration Symposium held at the Institute last month, December 14-16.

"Basic science has far outstripped the human factor," said Commander Robert J. Tranger, executive officer of the Office of Naval Research in Pasadena. "The limitations imposed by what the human body can stand are now approaching the limits of man's physical and psychological ability."

He was speaking at one of the two open sessions of the three-day meeting, which dealt almost exclusively with classified material and was closed to the public. Attended by more than 200 scientists and experts on rockets and guided missiles, the symposium was conducted by the Office of Naval Research for the National Research and Development Board.

Though it has always been known that men and machines are often endangered by the effects of mechanical shock and vibration, the full significance of these hazards has been recognized only in recent years. In any moving vehicle certain unwanted, destructive forces are generated because of vibration, shock and impact—on choppy seas, in bumpy air, over rough roads. All through the history of transportation a large assortment of cushioning devices and shock absorbers has been utilized, most of them on a trial-and-error basis. During the recent war, when men and machines had to be protected against the most severe conditions of shock and vibration which might be encountered, it became apparent that there was no prewar background of knowledge, so makeshift methods again resulted. After the war the Naval Research Laboratory got the job of centralizing current knowledge of mechanical shock and vibration. To perform this function a series of symposia was inaugurated. Last month's meeting at the Institute was the 14th in this series, and the second (the first was at Wright Field, in Dayton, Ohio, last September) to be held outside the Washington area.

Multi-Stage Rocket

■ EXPERIMENTS ARE NOW under way on a new type of missile which is expected to break the present 250-mile altitude record for rockets. The record-making two-stage rocket—a small WAC Corporal launched from a V-2 at about 20 miles altitude—was fired from the White Sands, New Mexico, Proving Ground last February (E & S, March '49).

The new missile, which has been test-fired at short, low ranges, is a multi-stage affair, presumably using a combination of three or more rockets to go off at intervals. Scientists believe that by adding still more stages to a missile, fantastic speeds may be attained in the region beyond the earth's atmosphere where there is no retarding friction of air.

Appeal for Funds

■ A DISTINGUISHED group of scientists—including six Nobel Prizewinners—made a public appeal recently for $75,000 to continue publication of the *Bulletin of the Atomic Scientists*. The *Bulletin*, they said, which was founded in 1945 by a group of scientists at the University of Chicago, was necessary to provide "an unbiased and thorough examination of the issues which crowd forward in the common field of science and public policy."

Originally, the monthly *Bulletin* was partly supported by grants from the Emergency Committee of Atomic Scientists. At the end of 1948 financing was taken over by a Board of Sponsors.

Among those who signed the appeal were Dr. Detlev W. Bronk, President of Johns Hopkins University; Dr. L. A. DuBridge, President of the California Institute; Dr. J. Robert Oppenheimer, Director of the Institute for Advanced Study at Princeton, New Jersey; Dr. Harold Urey of the Institute for Nuclear Studies at the University of Chicago.

Rain-Maker

■ DR. IRVING P. KRICK, head of the American Institute of Aerological Research, last month reported on a new technique for producing rain which obviates the use of dry ice and airplanes. According to Krick, the new method, which uses mobile dispensers of silver iodide "smoke" on the ground, just about quadrupled the rainfall in a small Arizona area.

The use of ground dispensers makes rainmaking a more economic procedure. Krick estimates that a job which would cost a million dollars for seeding dry ice pellets and silver iodide by plane could be done as well or better for $100,000 from the ground.

"Judging by the research operations in Arizona," he says, "large-scale surveys of the problem surely are in order."