Technology Notes

SPACE TECHNOLOGY

Manmade Ring for Earth

A vast artificial ring of dust around the earth has been proposed by a Russian engineer as a way of harnessing the sun's heat to warm up the entire planet.

The dust ring, composed of small opaque white particles orbited by a series of spaceships, would extend from a lower boundary about 600 miles above the earth to a maximum height of more than 6,000 miles.

The smaller the particles, according to V. Cherenkov in a Soviet publication called "Planet of Eternal Spring," the greater would be the useful surface of the ring. If the particle diameter was about one hundred-thousandth of an inch, he says, a ring 60 miles thick could produce heating energy equivalent to 270 billion kilowatts; a 300-mile-thick ring could produce the equivalent of 1,350 billion kilowatts.

The ring's orbit could be such, reports the engineer, that most of the energy would fall in the high latitudes, melting away the ice, making the tundras productive and making two-crop agriculture possible in the middle latitudes. About one billion pounds of dust would be required for the task, sent aloft by rockets in batches.

The technical feasibility of the project was endorsed by Academicians I. I. Petrov, A. D. Sakharov and L. A. Artsimovich, according to a report in SOVIET-BLOC RESEARCH IN GEOPHYSICS, ASTRONOMY AND SPACE (June 2).

THERMAL ENGINEERING

Wicks to Cool Spacemen

The complex system of pumps, gases and liquids used to control moisture and regulate temperature in space suits may be replaced by simple wicks, if research at the University of Illinois at Urbana is successful.

Under a contract with the National Aeronautics and Space Administration, university reseachers are studying two uses of wicks—closely-woven fibers which move liquids by capillary action. One use is to carry off perspiration, the other to remove heat.

Wicks controlling perspiration would be in direct contact with an astronaut's skin, in his suit, gloves or socks. Heat-carrying wicks would act as thermosyphons or heat pipes, carrying heat from the sunlit or warmer side of the space suit to the dark or cooler side.

The wicks would be largely self-regulating, and would work both in planetary gravitational fields and in the weightlessness of space, says Prof. John C. Chato, co-head of the project.

Besides being used by astronauts, Prof. Chato says, the wick system might be applied to protective suits for workers in steel mills, at high temperature furnaces and similar jobs.

SPACE PROPULSION

Liquid Metal Rocket Fuel

An unusual liquid-metal mixture is being investigated by scientists at Texas A. & M. University as a possible fuel for long-range space flights.

The mixture, consisting of sodium and potassium, could be used as fuel for electric rocket engines, which produce low thrust but are very reliable and sparing on fuel, says Dr. Nicholas Gothard, director of the project. Sodium-potassium has an advantage over many other substances, he says, in that it is both a liquid and a conductor of electricity.

The sodium-potassium-fueled engine may produce as much as 10 times the thrust of a conventional ion engine, Dr. Gothard says.

DENTISTRY

Jaw Gauge

A mechanical device to enable dentists to measure and record jaw motions so small that they are even below the level of human consciousness has been developed by General Electric Co., Schnectady, N.Y.

Designed for the Marquette University School of Dentistry in Milwaukee, Wis., the device can be used to study jaw movements during complicated processes such as talking, chewing and swallowing. The 20-ounce instrument is made of aluminum and can measure six angles of jaw movement in both inches and degrees of rotation with a maximum total error of one thiry-second of an inch.

The Marquette researchers will use their device, the only one of its kind, in studies that will aid in the fitting of dentures. Electrical signals from the instrument can be fed directly into an analog computer for analysis.

TRANSPORTATION

Two-man Rocket Belt

The Bell Aerosystems Co. of Buffalo, N.Y., has developed a two-man version of its versatile, experimental rocket belt.

Though the 147-pound unit presently has a maximum flight time of only 21 seconds, the company suggests that future uses might include: picking up paramedics dropped into inaccessible places; carrying forest rangers quickly to forest fires; and even carrying astronauts up from the moon's surface to a waiting orbital vehicle.

The unit, called Pogo, carries its crew single file, one behind the other. Fueled with nitrogen tetroxide and a mixture of hydrazine compounds—the same fuel as will be used in the Apollo lunar module—the unit has made almost 30 test flights.

CONSTRUCTION TECHNOLOGY

Instant Buildings

Inflatable buildings of polyester-impregnated fiberglass that hardens in the sun and can be cut and stitched to order—have been developed by the Ferro Corp., Cleveland.

The pressure required to inflate or lift a structure made of the company's material is reportedly little more than the weight of the material itself—about two or three pounds per square foot. A 50-foot-diameter dome ought to harden in two days, the company estimates, while a half-mile dome designed to enclose an entire city might take as long as eight to 10 days. The material, when cured by ultraviolet radiation, will not support combustion, and must be cut with a hack saw or diamond saw.