

Crops Fail, Food Crisis Mounts

► **POOR HARVESTS** of crops in parts of the world and a population increased by about 70 million persons in the last year have magnified the world food crisis, the United Nations Food and Agriculture Organization reported.

"Any remaining complacency about the food and agriculture situation must surely have been dispelled by the events of the past year," Dr. B. R. Sen, director-general of the FAO said.

Dr. Sen commented on the serious world situation in a foreword to the FAO's 242-page annual report called "The State of Food and Agriculture—1966."

Because of crop failures caused mainly by drought, the food output of 1965-66 was no larger than the year before, but population increased by several millions.

This means there was a decline of about two percent in food production per person throughout the world.

In some countries, such as Africa, Latin America and the Far East, food production per person dropped as much as four to five percent, according to FAO estimates based on information available up to July 1, 1966.

The world food situation is now more precarious than at any time since the period of acute shortage immediately after the Second World War, Dr. Sen pointed out.

Large reserves of grain, usually stocked in North America, were depleted in part this past year by emergency shipments to drought-stricken countries such as India. Because we do not have a large surplus to fall back on, the world is now much more dependent upon its immediate food production, which in turn depends on the weather.

With such a precarious situation, there is always the danger of a setback such as the one we are now undergoing.

Food production was not low everywhere.

It rose by some four percent in North America, and by a fraction of one percent in western Europe. But it fell slightly in eastern Europe and the USSR, and by six percent in Oceania.

Official statistics were lacking for Mainland China, but grain production was believed to have declined slightly, in that country.

Nuclear Rocket for Mars

When man finally reaches Mars, he will very likely be carried through space by a solid core nuclear rocket to be available in the 1980s

► **THE MOST EFFECTIVE** form of propulsion for a manned landing mission to the planet Mars during the favorable 1984-1988 flight period would be a solid core nuclear rocket, an aerospace executive said.

Raymon Hallet Jr., vice president-deputy general manager of the joint subsidiary of the Douglas Aircraft Company and United Nuclear Corporation in Richland, Wash., told the International Astronautical Federation in Madrid that the multi-stage rocket would be assembled in earth orbit, with a cluster of nuclear engines on the booster stage firing to propel the vehicle toward Mars.

The graphite solid core system, using hydrogen as an expellant, could be available by 1984, Mr. Hallet reported.

A nuclear electric rocket or a hybrid nuclear/nuclear electric rocket could follow in the late 1980s or early 1990s, while the more efficient gaseous core reactor probably would not be feasible before the early 1990s.

Mr. Hallet said the 1984-88 period is more favorable for the Mars mission than the late 1970s because the transit time would be shorter, reducing the physiological and psychological risks faced by the crews.

In addition, he said, current research indicates solar flares will be less frequent and at a low level of intensity during the later period, thus requiring a minimum of shielding protection for the astronauts.

The additional time will permit more extensive research into the atmosphere and surface of Mars and into radiation fields and meteoroid environment in space.

If, however, the decision is made to land men on Mars during the late 1970s, then a multi-stage chemically propelled rocket similar to those in use or under development today would be the logical choice of this conjunction class flight, he said. Transit time would be almost three years.

GENERAL SCIENCE

Michelson Winner Named

► **FOR HIS** "significant contribution to knowledge and the welfare of mankind," Dr. Edwin H. Land has been awarded the Albert A. Michelson Award of the Case Institute of Technology, Cleveland.

The honor has been awarded annually since 1963 in recognition of Albert Michelson who was the first professor of physics at the Case Institute. It is given to keep alive "the tradition of scholarly inquiry" exemplified by Michelson and to cite the "continuing importance of the scientist and the engineer to the general welfare."

Prof. Michelson, in the famous Michelson-Morley experiment, first showed that the then-supposed "ether" did not exist. This finding caused a revolution in physics.

At the awards banquet, Dr. Land was cited as "a pioneer in optical research for the invention of Polaroid and its wide application in science and technology, the design of the Land camera, his contributions to color vision, color photography, three-dimensional motion pictures and for many innovations in basic and applied optics."

Dr. Land, president of Polaroid Cor-

poration, Cambridge, Mass., received the Presidential Medal of Freedom from President John F. Kennedy in 1963.



Dr. Edwin H. Land