

ASTRONAUTICS

See Safe Space Landings

➤ HUMANS can land safely from space on Venus, earth, Mars and Jupiter, if and when the space ships are available.

That is the conclusion to be drawn from a highly mathematical study of manned entry into planetary atmospheres reported by the National Advisory Committee for Aeronautics.

Dr. Dean R. Chapman of NACA's Ames Aeronautical Laboratory, Moffett Field, Calif., has developed a solution to the general equations of motion that can be used by engineers to calculate how virtually any kind of vehicle would react when entering a planet's atmosphere. Included are skip, glide, satellite, ballistic or space vehicles.

Among the important aspects of the "challenging problems connected with space flight" are the intense heating and the possibly severe forces of deceleration for human occupants. Another is having satisfactory control over both the time and location of landing on a planet.

Although each of these related problems is difficult, none is insurmountable, Dr. Chapman's analysis showed.

His "relatively simple equations" apply to any selected planetary atmosphere and to both lifting (airplane-like) and non-lifting vehicles, whether they make a shallow or a steep descent. They also apply to a com-

bination of the various kinds of entries, even when these are changed during descent.

For earth, Dr. Chapman finds, the region of most important heating and deceleration for a given vehicle occurs only over a roughly 70,000-foot strip across which the air's density changes by a factor of 20.

Entry into the atmosphere of Venus involves only slightly less deceleration and heating than entry into the earth's atmosphere. Entry into the Martian atmosphere involves much less deceleration and heating, and entry into Jupiter, much more.

Comparison of Dr. Chapman's solution with electronic computer results for a standard earth atmosphere shows only small differences of about ten percent. His report, "An Approximate Analytical Method for Studying Entry Into Planetary Atmospheres," is expected to become the space engineer's bible.

Science News Letter, June 14, 1958

FOOD TECHNOLOGY

Temperature and Time Affect Frozen Foods

➤ "SENSITIVE" TURKEYS have the frozen food industry worried.

Even when the temperature is held at

below freezing, 20 to 25 degrees Fahrenheit, a frozen bird will very likely darken. Frozen poultry, the U. S. Department of Agriculture has reported, loses flavor and attractiveness with increasing speed as storage temperatures rise. Turkeys generally are more sensitive to temperature than are chickens.

Both cut-up and pre-cooked poultry are less stable than whole, uncooked poultry when it comes to undesirable changes. However, at 10 degrees Fahrenheit and lower, chicken a-la-king will keep its meat flavor for as long as a year. To complicate the problem, fried chicken will "turn" twice as quickly at these temperatures.

Chlorophyll, research with green beans showed, is lost at the rate of about 10% annually at zero degrees Fahrenheit. At 30 degrees Fahrenheit, still below freezing, this loss occurs about 50 times as fast as at zero. This green color in frozen snap beans is lost about twice as fast as in frozen peas.

Frozen foods, USDA scientists pointed out, decline from top quality as a result of several kinds of change, all of which move increasingly faster as temperature rises.

The USDA's western utilization research and development division at Albany and Pasadena, Calif., is currently trying to find out why these changes take place and what can be done about giving the consumer the best quality for his dollar. "Time-temperature-tolerance" studies are providing some much-needed answers.

Science News Letter, June 14, 1958

Questions

ANTHROPOLOGY—How do the inhabitants of various villages in the Philippines determine when to start their sowing? p. 372.

ASTRONOMY—What are the dimensions of a second-order cluster? p. 371.

PHYSIOLOGY—What is the scientific name for "runaway heart"? p. 374.

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Do You Know?

The lowest note a person can sing is frequently the pitch employed for his speaking voice.

Of more than 1,200 patients over 40 examined recently in a U. S. hospital, four percent were found to have unrecognized glaucoma.

People are more sensitive to and can detect more minute concentrations of certain chemicals that affect the flavor of foods than any instrument yet devised.

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