

SPACE

Coated Beef for Spacemen

► EDIBLE COATINGS for whole slices of roast beef, potatoes, dessert and cookies may give tomorrow's astronauts like M. Scott Carpenter the comforts of home on long space hauls.

Such coatings keeping some space foods fresh, moist and free from dust for months have already been developed.

The edible coverings will have the great advantage that no trash from wrappers or containers will become a problem on long space trips. It is also time-saving when the astronaut does not have to peel a wrapper off the food items he wants to eat.

The new coatings, which are now in an experimental stage, are being developed at the Aerospace Medical Research Laboratories at Wright-Patterson Air Force Base, Dayton, Ohio.

A SCIENCE SERVICE staff writer made a taste-test at a visit to the Labs of sugar-glazed pecans which were fresh and moist after having been stored six months. The nuts looked as if freshly shelled. Fudge with a modified cellulose coating, a material derived from plants, tasted like fresh store-bought candy. The fudge covering looked like something between a cellophane and wax paper covering which had no taste and melted in the eating.

Dr. Alton E. Prince, chief of biospecialties at Wright-Patterson, said that the research with the edible coatings attempts to keep food attractive as well as practical for travel into deep space. "The first pioneers will not mind using squeeze-tubes and experimental bite-size solid foods, but on long flights a normal appearance of food becomes important, and later astronauts will demand the comforts of home," he said.

For astronauts on trips up to three months who work in a shirt-sleeve environment the ideal would be to eat off trays, it was suggested. To these spacemen a thick slice of roast meat (with an edible protective coating still to be developed) would look mighty good and should be possible to take along. The meat would first be cooked and then coated so that the spaceman would only have to heat it.

A kind of clam-shell spoon device might be used to eat the food in the weightless environment. A spring in the handle could help to pick up the food from a container on the tray and a release in the handle would help to insert it into the mouth. Some such device would be necessary because although food would stay on the tray in the weightless environment until moved, it would then keep moving in that direction until stopped by another object.

Astronaut Carpenter, the first U.S. man in space to eat solid food, had bite-size samples of high protein cereal with nuts, high protein cereal with fruits, fruits and nuts mixed, fruits and nuts separately.

His foods, provided by the U.S. Army Quartermaster Food and Container Institute, Chicago, did have a digestible on-the-outside coating with a minimal nutritional value, the National Aeronautics and Space Administration told SCIENCE SERVICE.

The purpose of this coating was to keep in flavor and dryness (since it was a test to see how an astronaut manages to eat solid food) and to keep the environment out.

Carpenter reported that he had no difficulties in eating the bite-size snacks of solid food, although they were a little crumbly.

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manual handling of the switches controlling the robot's movements.

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Astronaut Carpenter Could Take Box Lunch

► THERE IS no reason why Astronaut M. Scott Carpenter could not have taken a box lunch, including a ham sandwich, with him on his orbital space trip.

The ham sandwich was suggested as an astronaut's lunch by Col. John H. Glenn Jr. after his historic flight on Feb. 20. Dr. George Kitzes, chief of physiology, Aerospace Medical Research Laboratories, Wright-Patterson Air Force Base, Dayton, Ohio, said there would be no problems in eating the ham sandwich if an astronaut is able to pick it up and hold it with the heavy stiff glove of his pressure suit.

An astronaut could take with him the box lunch now eaten by crews in military aircraft, Dr. Kitzes said. This lunch consists of two sandwiches, tomato juice, milk, a hard-boiled egg, a piece of chicken, plus salt and pepper, cookies and a candy bar. This lunch will stay fresh and appetizing for about five hours.

When Astronaut Glenn suggested the ham sandwich, he meant there would be no problem in getting the food into the mouth and chewing it. However, a problem besides handling the sandwich would be to unwrap it.

Astronaut Glenn found he could handle a squeeze tube when he ate some apple sauce from a tube on his flight. Dr. Kitzes said it might not be as easy to hold a chicken leg from the box lunch or handle the sandwich. It would also be somewhat difficult to open the milk carton, or the tomato juice container, and drink the liquids as well as to unwrap the candy for a dessert snack.

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Robot "Talks" to Man

► A MASTER SLAVE ROBOT that by mechanical sound transmission can tell its operator how he is handling objects in soundless space is being developed.

Spacemen directing robot "arms" from inside a spacecraft, for picking up specimens of rocks on the moon and planets, have no "fine feel" concerning how they are handling such samples with the robot's "hands," called jaws, Lt. D. Fred Baker, research psychologist at Wright-Patterson Air Force Base, Dayton, Ohio, told SCIENCE SERVICE.

Experiments are now being made with a new model robot using audio-feedback from sensors on the end of the jaws to transmit sound back to the spaceman's ear-phones.

The sound tells the robot operator:

1. Whether or not he has made contact with the object he is trying to reach.
2. Whether he has bumped into something.
3. To what degree the motor is operating.
4. If he is picking something up to the

left or the right.

5. If the sound is coming from the left or right.

The new robot model is also used to investigate the best angle and height for handling objects and performing various tasks. Maintenance on the outside of a space station or space ship is one such task. Others are exploration, construction (perhaps of a moon station), emergency rescue, transfer of personnel and equipment.

Another master slave now in the experimental stage uses electrical controls. One great advantage of this mobile remote handling unit will be that the movements of the jaws outside can be watched on a TV screen in the control room. Plans are now being made to install several TV sets in the control room to achieve a stereo effect.

This unit, named Robot E. Lee because the Lee Manufacturing Company produced it, can be controlled two different ways. One is by a joy-stick control steering all switches automatically, the other is the

GEOPHYSICS

Balloons to Rise From Texas Science Station

► BALLOONS will soon be taking off with research instruments from a new station at Palestine, Texas, to make observations at high altitudes in the earth's atmosphere.

Located so that flights can be made at all times of the year, the new station will be operated by the National Center for Atmospheric Research, Boulder, Colo., with funds from the National Science Foundation.

Telescopes will be lifted by balloons above the clouds and primary cosmic radiation will be measured upon special flights.

The site at Palestine was selected on the basis of climatological conditions, expected flight trajectories, remoteness from established air lanes, existence of a suitable airport for use by aircraft in support of balloon experiments and cooperation of local officials, among other criteria. Current plans call for establishment of the station on a temporary basis.

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