aimed at research on possible brain damage caused by radiation.

Nevertheless, the brains were preserved and kept, and during the past year they have undergone analysis by a team of neurologists at NASA's Ames Research Center, Moffett Field, Calif. Thousands of sections of these monkey brains have been examined by Dr. Webb Haymaker, chief scientist of the life science department at Ames, along with Drs. Orville T. Bailey of the University of Illinois, Steve Vogel of Duke University, Wolfgang Zeman of the University of Indiana and Eugene Benton of the University of San Francisco.

The neurologists proposed to determine how many of the HZE particles stopped in the brain, and if any of these could be found. Photographic emulsions over the heads of the primates had recorded all cosmic rays hitting the head, but the trajectory of these particles was not followed into the cell. This complicated the determination as to what effects had been actually caused by these particles.

The results, according to Dr. Haymaker, showed that a large number of these particles did terminate in the brain. The four scientists found pathological changes in the primate brain cells as well as evidences of change to nerve tissue and blood tissue.

Charles A. Wilson, project manager of the Biosatellite Program at Ames, described the situation as a statistical problem. Of the 1,400 or so cubic millimeters in the brain only a small portion are actually control center areas. Sooner or later, however, Wilson says, one of these particles could hit a critical place that could cause functional damage.

The data collected were presented in early June to a radio biological panel that met at Ames. The problem facing the group of scientists now, says Dr. Haymaker, is how to interpret the changes that were found. The panel is now evaluating the findings and examining the variables to determine whether the data justify further investigation or more monkey balloon flights.

At present, however, there are no plans at NASA for experiments involving primates. Dr. Ross Adey, the UCLA researcher whose Biosat monkey Bonnie died last July after a few days in space (SN: 7/19/69, p. 46), is presently doing a post-mortem on the monkey's brain for evidence of HZE particles. The next project of any kind with bioexperiments aboard will be Skylab in 1972, and those will involve only pocket mice and drosophila flies.

As Maj. Gen. J. W. Humphreys Jr. of the Office of Manned Space Flight summed up the official NASA view during Congressional hearings last year: "I think in the final definition man is the test animal." □

CYCLAMATES

Still on the block

One Saturday last October, former Health, Education and Welfare Secretary Robert H. Finch called a press conference to announce a total ban on cyclamates (SN: 10/25, p. 369). Though a battle over the safety of the artificial sweeteners had been raging for some time, the Secretary's categorical declaration seemed to come without warning. It settled the issue for about a month.

In late November, acting on the advice of an ad hoc committee working under Assistant Secretary for Health and Scientific Affairs Roger O. Egeberg, Finch modified his stand and the Food and Drug Administration, which regulates food additives, rewrote its rules accordingly (SN: 12/6, p. 524): The ban on cyclamates in beverages would stand but manufacturers would have until Sept. 1 to phase the sweeteners out of canned foods. Meanwhile, cyclamates would be reclassified from food additives to drugs and could be sold thereafter as over-the-counter, nonprescription drugs.

That is more or less where the matter stands at the present. But it is not standing still.

On two fronts changes are anticipated. One involves the fate of cyclamates themselves; the other the law that got them into trouble.

When the FDA ruled that cyclamates could be classified as drugs, it did so on the basis of the Egeberg committee's conclusion that they offer some medical benefit to diabetics and obese individuals who must avoid sugar. The presumption was that their benefits to these persons outweigh the risk of developing cancer that was raised last fall when scientists turned up evidence that massive doses of cyclamates produce bladder tumors in rats.

Within the scientific community, and within the FDA itself, there is considerable opposition to this presumption. FDA Commissioner Charles Edwards is convening a scientific review panel to evaluate old and new data on the subject. Its judgment is expected within three or four months and it is not unlikely that cyclamates will lose their over-the-counter drug status and that the total ban will be reinstituted.

Dr. Edwards has the support of Rep. L. H. Fountain (D-N.C.), who for years has been a gadfly to the FDA. Fountain wants to know what suddenly makes cyclamates drugs.

The law does not permit the casual reclassification of food additives as drugs, he told Dr. Edwards in a June 24 letter; neither the safety nor the efficacy of cyclamates as a drug has been established, and Fountain wants the total ban to be reimposed.

On the second front—the law that sustains the ban—action is not anticipated as soon. In banning cyclamates, Finch indicated that he did so reluctantly but that his hand was forced by the Delaney Amendment to the Food and Drug Act, a provision that flatly prohibits use of food additives that in any dosage cause cancer in any animals. Legislative aides at HEW recently drew up a revision to the Delaney Amendment, modifying its categorical nature by replacing a flat prohibition of cancer-causing additives with a provision allowing for maximum allowable tolerance levels. That raised complicated questions about what the safe limit of a carcinogenic agent is. At the same time, HEW and FDA are facing pressure from scientific organizations to expand the prohibition to bar chemicals that cause mutations and deformities in unborn children (SN: 3/28, p. 314).

Dissatisfied with the proposed Administration revisions to the Delaney Amendment, Dr. Edwards and other HEW officials have managed to table the issue for the time being. □

SHIPBUILDING

Return of the destroyer

They were called destroyers, and once they were the pride of the Navy. Fast, mobile warships, they sent enemy submarines scurrying for safety. But in the half-peace that followed World War II, the greyhounds of the ocean—except for piecemeal replacements—largely slept wrapped in memories and mothballs.

But that has suddenly changed. The Navy Department announced last week that it had awarded Litton Industries a $2.5 billion contract for the construction of 30 multipurpose destroyers. Although providing nowhere near the dozen-a-month figure of World War II, this contract marks the first destroyer construction program since the late 1950's. These ships, the first of which will be delivered in 1974, are expected to be the backbone of the Navy's destroyer fleet in the 1970's and beyond.

The ships will belong to a new class of multipurpose destroyer called the Spruance. They will be driven by gas turbine engines, making them the first major warships in the Navy to use this power source, which offers great mobility. In addition, the highly automated operation of the ships enables them to be run by 20 percent fewer personnel than present destroyers.

The main role for the ships will be antisubmarine warfare, but they will also be equipped to bombard shore installations and launch missiles.

All 30 ships will be built in one spot, Litton's Ingalls West facility at Pasca-