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

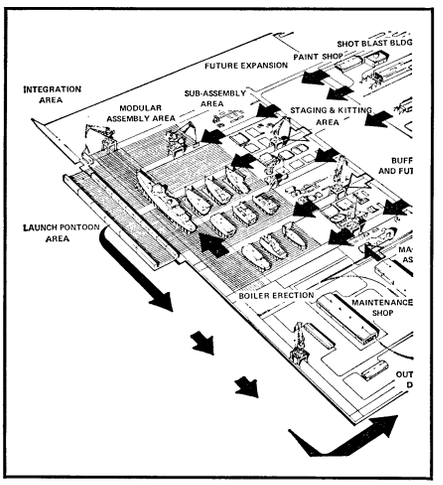
They were called destroyers, and once they were the pride of the Navy. Fast, mobile warships, they sent enemy submarines scurrying for safety. But in the half-peace that followed World War II, the greyhounds of the ocean—except for piecemeal replacements—largely slept wrapped in memories and mothballs.

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-



Litton Industries

Pascagoula: Assembly-line destroyers.

goula, Miss., although there will be a good deal of subcontracting. In order to turn out such a large number of ships economically in so short a time and in one place, they will be mass-produced on an assembly-line basis.

A ship-building technique called modular construction makes this possible. In ordinary construction, the ship is built from the keel up so that the hull is completed first. The ship is then outfitted (piping, electronics, air conditioning, engines) from the top. In modular construction, the ship is constructed in three separate modules that are then welded together. In this way, the ends of each section are kept open so workmen and materials can move easily in and out. When the three sections (bow, midships and stern) are welded together, they form a ship 92 percent complete as compared with 68 percent for traditional construction.

A unique feature of the process is the final step: launching. Instead of the usual method of launching it down an incline stern first or sideways, the ship is shunted by rail to a nearby pontoon launch, which is in essence a floating drydock. After the dock carrying the ship has moved out to deep water, it sinks, freeing the vessel.

The advantages offered by this method are that the launch is smoother, safer and more controlled so there is less chance of accident, a great variety of ship sizes can be handled, the launch provides an additional work station and the ship can be retrieved immediately if something wrong is spotted.

The last destroyer is expected to roll off the assembly line in 1978. Because of the size of the project, Litton's involvement is expected to give the rest of the shipbuilding industry a shot in the arm. "With Litton tied up," says Walter Oates of the Maritime Administration, "other work generated from other centers will go to other yards. Anything else that came down the pipe, Litton wouldn't be a contender." □

AMA

Abortion, dues and malpractice

Shielded by a hired guard from possible invasions of minority group patients, activist students, disgruntled health workers and others who find fault with the nation's health care system, delegates of the American Medical Association gathered in Chicago for their 119th annual convention in an atmosphere of siege (SN: 6/27, p. 615).

Neither AMA members, newsmen, delegates' wives nor anyone but the most honored guests were allowed inside the security-ringed hall for the opening-day ceremonies that had been disrupted by demonstrators in previous conventions (SN: 7/26/69, p. 76). Although later in the week selected visitors and the press were allowed inside—while the demonstrators were denied a return match—the cramped conditions of the hotel hall that had been chosen for maximum isolation left most observers watching on closed-circuit television in a nearby ballroom.

Among the events they could see was a florid hour-long debate that ultimately led the 244 delegates to approve the second liberalization in three years of the AMA policy on abortion. The organization's trustees had asked that the policy be eased to accommodate members in such states as New York, Alaska and Hawaii, where new laws make the operation largely a matter to be decided between a woman and her doctor. The last previous change in AMA policy, in 1967, permitted therapeutic abortions to preserve the life or health of a woman, or to prevent the birth of a deformed child, or to end a pregnancy resulting from rape or incest.

At this session the delegates did not go as far as the trustees asked in clearing a path toward what extremists on both sides sometimes call abortion on demand. But they did, in essence, remove the adjective "therapeutic" and recognize abortion as being "like any other medical procedure."

The new policy insists abortion must be performed in a hospital only after consultation with two other physicians, and in accordance with applicable state law. The statement also goes to some length to establish that no physican can be compelled to participate in abortion.

While some delegates against a liberalized abortion policy seemed to think they had succeeded when the voting was over, a committee chairman who had steered the measure through hearings, Dr. Wendell G. Scott of St. Louis, told a news conference later: "Now an abortion can be done for any reason if it's in the best medical interests of the patient." And the president of the National Federation of Catholic Physicians Guild, Dr. Gino Papola, of Upper Darby, Pa., said he was writing his 6,000 members urging them to quit the AMA.

An equal amount of debating time was spent by the delegates before they could agree to raise the yearly AMA dues to $110. This is a $40 increase, but only half the hike the trustees had asked for. Every proposal for an AMA boost brings complaints from delegates that doctor-members are not in close enough control, or even aware, of how their money is being spent. One version of that was heard from Dr. Sidney Adler of Detroit, who warned, "We're not running a jelly bean factory . . . and there are plenty of people back home who want to know what for and why" when the trustees ask for more money.

The AMA is a more than $30-million-a-year operation that, the trustees said, is beset by inflation, sinking values of its investments portfolio and a new Federal tax on its $10 million advertising revenue.

Nevertheless a new program was approved by the delegates even before they tackled the dues issue. Expected to cost $10 million over the next five years, it is a "communications program to the nation's people," complete with television documentaries and an advertising campaign.

The advertising campaign was endorsed by one delegate as a means to "sell private medicine as other products are sold commercially."

The delegates also agreed that the AMA must establish "as rapidly as possible" a malpractice insurance program (SN: 12/13/69, p. 552) which will be sponsored by the national organization and state medical societies. Contract negotiations will begin in July with a potential underwriter for an insurance plan to alleviate what a delegate here called "one of the greatest concerns of the practicing doctor."

Pressed by the nation's obvious need for more physicians, the AMA policy-makers made several moves designed to shorten the time spent in formal medical education. One will, in effect, do away with the internship year by 1975 by combining it with residency training. Yet to come are such AMA measures as might establish "a maximum of six years from high school to the M.D. degree," which was urged by the new president, Dr. Walter C. Bornemeier, of Chicago.

The delegates voted staunch opposition to the Food and Drug Administration's order for lay-language warnings (SN: 3/14, p. 266) to be wrapped with every package of oral contraceptive pills. □