

were unable to defend themselves or strike back." Almost all of the teachers in the study had "some psychophysiological manifestations of long-term stress." And of the total group, 134 had documented "extensive medical histories representing two to 10 years of psychophysiological response to continued stress," Bloch reports.

"Factors predisposing to neurosis in military personnel were applicable to these teachers," he says. "Primarily, these centered around an impaired ability to deal effectively with fear or anger." Almost 80 percent of the teachers who succumbed to sustained stress were categorized as passive, rigid and moderately obsessive. Much of their low morale and feeling of helplessness, Bloch suggests,

came from lack of support from their school administrators.

"The teachers said they were usually discouraged [by administrators] from reporting incidents of violence," he says. "Thus, they were denied an important opportunity for obtaining support and reality testing." Many of the teachers were also denied requests to transfer to less stressful schools. "The added stress of no exit from what they viewed as an intolerable situation contributed to the development of symptoms," he says. "Psychophysiological complaints increased until many became disabled." He recommends measures to help teachers prepare for and deal with school violence. The measures include crisis intervention and psychological training for teachers. □

Energy bill passes, many others don't

The Senate and House chambers were a flurry of activity last weekend as legislative brokers worked well into the night settling last-minute deals in the closing hours of the 95th Congress. Debate-weary members frequently crossed party allegiances to strike the compromises that made passage of many important bills possible. Among the most impressive results was a break in the stalemate over President Carter's energy bill. Many other touch-and-go bills fared less well. In fact, of the more than 22,000 pieces of legislation introduced in this Congress, only a little more than four percent made it through both the House and Senate. And of those passing both houses, only about 55 percent became law (this number excludes any currently awaiting Carter's signature). Here's what happened to some of the more important bills that were pending last week.

Unquestionably, one of Carter's strongest victories was the final passage of an energy bill. Although it bears only a faint resemblance to the package that Carter proposed 18 months ago, it does represent the first national policy to come through Congress that accounts (or at least tries to) for the synergistic impacts that use of coal, gas and oil—the nation's three major fuels—has on both the economy and the availability of future energy supplies.

The President would have raised fuel prices with taxes to encourage energy conservation and to avoid energy-providers raking in windfall profits. Instead, Congress chose mainly to "encourage" conservation with regulation and tax subsidies. The only Carter tax that remains is for cars with poor fuel efficiency.

The most controversial part of the energy package—and the one largely responsible for the eight-month House-Senate conferencing—was natural-gas price decontrol. Congress voted to let gas prices increase gradually toward complete decontrol sometime in the mid to late 1980s. While Congress chose not to maintain arti-

ficially low oil prices, it also chose not to raise them; that is left to Carter. Earlier, he pledged to raise oil prices to world levels within two years.

Briefly, the bill also requires most electric power plants to switch to coal from oil or gas; where feasible, industry is asked to do the same. New energy-rate structures would also encourage conservation. And both consumers and industry would qualify for tax credits on insulation and energy-conservation investments. Finally, utilities would be required to provide information and some financing for "winterizing" homes.

On another front environmentalists won a small victory with resolution of whether and how much to continue protecting endangered species. Fearing that the Endangered Species Act endangered some public works projects, Congress wrote a compromise amendment into the Act (SN: 5/13/78, p. 310) and attached it to the Act's funding. Then a snag developed. Although money to fund the Interior Department's Office of Endangered Species was appropriated, it was not authorized. With the start of the new fiscal year on October 1, endangered-species protectors were left unfunded and forbidden to do any endangered-species-related work (SN: 10/7/78, p. 247). One Tennessee congressman had threatened to stall floor action on the Act's FY 1979 authorization bill last week by introducing 600 or more amendments to the Act. But in the end, an 18-month reauthorization passed.

Environmentalists scored another gain with passage of the Boundary Waters Canoe Area bill. It would declare a million acres in Minnesota (on the Canadian border) as a natural wilderness. Logging and mining would be banned; motorboats and snowmobiles would be restricted.

Environmentalists failed to win support, however, for passage of their major campaign this year, the Alaska Lands bill (SN: 5/27/78, p. 343). Called the greatest conservation issue of the century, it would

have set aside millions of acres of new national parks, wildlife refuges and wilderness areas. It would also have prohibited gas, oil and hard-rock mining on much of the land. Various environmental coalitions around the country have spent whatever they had—in time, money and physical labor—for an all-out lobbying campaign to counter mining-lobby interests. Some now feel that the next time around they will be unable to regain the momentum they strived so hard to develop.

Also dead, at least this time around, is the deep-sea mining bill. It would have specified which minerals (such as copper, manganese and nickel) could be mined on the ocean floor and would have set up a licensing procedure for staking claims. (Backers say they will reintroduce the same bill on the first day of the next Congress.)

Offering to take "compassionate responsibility," the Congress has approved a program to clean up the uranium mill-tailing wastes at 22 abandoned Manhattan-Project (World War II) sites. The cost is estimated to run between \$120 million and \$180 million. In addition, Congress voted to extend the Nuclear Regulatory Commission's licensing authority to cover mill tailings. Although NRC has jurisdiction over active mills, it has no direct authority for wastes at abandoned sites, particularly those abandoned decades before the agency was formed.

Finally, President Carter's dream of a separate, Cabinet-level Department of Education is just that—a dream—unless and until the next Congress approves the founding legislation. □

Skylab now watched full time

The Skylab stakeout was upgraded late last week to a round-the-clock affair. The nearly 100-ton earth-orbiting facility has been of concern ever since it was realized that it might reenter the atmosphere—with chunks perhaps reaching the ground—before a space shuttle mission could boost it to a higher orbit. NASA tracking stations have been monitoring Skylab for about 16 to 20 hours per day, but 24-hour coverage began late on Oct. 14 with the addition of the station at Santiago, Chile, and of new control-room shifts at Johnson Space Center in Houston.

The control-room crews have had not only to monitor Skylab's condition, but also to be ready in case some malfunction aboard required corrective commands to be transmitted up from the ground. The last such commands succeeded on July 25 at stabilizing the space station in a position of minimal atmospheric drag, sought in an effort to help keep Skylab aloft as long as possible. Only six days earlier, a problem cost Skylab much of its remaining

supply of attitude-control gas, but since that time it has behaved perfectly, using no gas at all in the intervening 12 weeks. One deliberate maneuver is planned for Nov. 4 — “and maneuvers,” says a NASA official, “are when things sometimes go wrong” — when the space station will be turned nose-for-tail to take a rather friction-prone bearing out of shadow so that its lubricants can warm up. About six months later, it will be turned back again, again a simple maneuver except perhaps for a five-year-old, long-dormant facility not planned for such tricks in its twilight years.

In trying to predict when Skylab will reenter the atmosphere (if unreached by the space shuttle), NASA now estimates that the chance will reach 50-50 by April 1980, with the “point of natural decay” beginning two months later. All such calculations, of course, are subject to many of the same uncertainties that necessitated the stakeout in the first place. □

Seasat-A: Concern and questions

The Seasat-A experimental ocean-monitoring satellite was sent into orbit on June 26, carrying an array of sensors on a diverse mission (SN: 7/1/78, p. 4) that was to have lasted at least a year, with planned extensions if everything went well. Instead, just 15 weeks after the launching, the probe apparently suffered what officials say was a malfunction that stopped its transmissions and may also have ended its ability to receive ground commands. That would leave it effectively “dead” in space.

Signs of the incident were detected late on Oct. 9, beginning when several onboard irregularities, including a high current drain from the spacecraft's batteries, showed up in data from a tracking station in Santiago, Chile. Later, while Seasat-A was being tracked from Ororral, Australia, its S-band receiver, used for picking up commands from earth, abruptly shut off, followed a few seconds later by the transmitter. (Since then, project officials have found additional data, now being evaluated, from a Seasat tracking station in England, whose coverage spanned the period between the Santiago and Ororral passes. Ironically, it was only two days earlier that the directors of NASA and the European Space Agency had signed a memorandum of understanding providing for the acquisition of the probe's data for a special European Seasat Users Research Group.)

Flight controllers at Jet Propulsion Laboratory in Pasadena continued to send commands to the spacecraft in hopes that it could be reactivated, but no success had been reported as of Oct. 17. Meanwhile, occasional transmissions at frequencies close to Seasat's were being recorded, but indications were that they were from

Landsat 3 and other satellites broadcast- ing on similar bands.

From launching to the report of the malfunction, Seasat-A had had its sensors in operation for a total of 99 days (an initial period was devoted to checking out the spacecraft and fine-tuning and measuring its orbit). All but one of the sensors were microwave instruments assigned primarily to such tasks as monitoring wave heights and directions, tides, currents, ice fields, and temperatures and winds at the sea surface. (The one nonmicrowave instrument, a visual-and-infrared imaging radiometer for day-and-night photography, failed earlier in the mission.) The project, although apparently cut short, went a long way, officials say, toward its goal of demonstrating the concept of the microwave approach to ocean studies.

There, except for the months of data analysis that remain, the story would end — and perhaps it does. But there are signs that there has been more to the Seasat saga than has met the public eye. A principal factor in such suppositions is one of the satellite's sensors known as a synthetic-aperture radar, or SAR. On Seasat-A, the SAR has been used primarily for its microwave “images” of the ocean surface, revealing wave patterns and other disturbances as small as a few meters across (SN: 8/5/78, p. 89). Experience with the device as a satellite-borne oceanographic sensor is limited, and researchers are still in the process of learning what the images are really showing. They are investigating the possibilities of seeing currents, shear zones, weather correlations and even perhaps subsurface thermal upwellings, all from a sensor that is recording radar reflections from presumably the uppermost millimeter or less of the ocean.

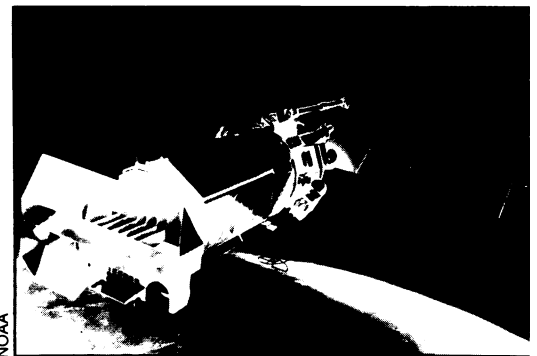
There has, however, been some military SAR experience, and reports of military interest in the civilian Seasat program (beyond the meteorological concerns of the U.S. Navy's Fleet Numerical Weather Central) seem to hover around it like ghost stories or UFO sightings — difficult to substantiate, but repeatedly popping up. One source close to the program has told SCIENCE NEWS, for example, that the Defense Department once sought to have the data from the SAR and a companion sensor (a microwave radar altimeter) classified, but that the National Security Council determined that Seasat would operate as a “totally open civilian satellite.” Failing that, says the source, an option for a different sort of military constraint was achieved by persuading NASA to submit each proposed operation of the SAR for Defense Department “clearance,” or, by implication, veto. This assertion is unconfirmed, but not greatly at odds with the tenor of the Seasat “rumor mill.”

Why might there be such interest? What could the SAR reveal that other “sky-spy” satellites might not, or that would suffer from appearing in publicly available data? One possibility, labeled “unlikely” or “far-

etched” by some sources but stated — though again unconfirmed — by three others, is this: The assertion has been made that, perhaps by specialized analysis of the data, it has been possible (one source says “may have been”) to detect signs of submarines (apparently nuclear) operating at depths as great as 1,500 meters. Some researchers conversant with synthetic-aperture radar reject the idea, since it would almost certainly depend on surface manifestations of the submarine's passage. Others, however, acknowledge at least the possibility of such exotic effects as a change in the surface's dielectric constant due to temperature variations caused by the heat of a nuclear sub's reactor coolant.

Even assuming that such assertions are so, Seasat-A would not be a unique case of military/civilian conflict in space programs, and the interagency committee on space policy recently created by President Carter (SN: 10/7/78, p. 244) has been designed in part to deal with such issues. Meanwhile, the “backup” unit to the Seasat SAR is being readied for a civilian mission on an early space shuttle flight. Who will be looking through its radar eye? □

TIROS-N launched



On Oct. 13, after a month-long series of delays, the TIROS-N “environmental” satellite was launched for the National Oceanic and Atmospheric Administration, destined for a major role in the upcoming worldwide weather study of the Global Atmospheric Research Program (GARP). Besides scanning and photographing the land and seas, the 723-kilogram probe will provide vertical “soundings” of the atmosphere, measure particle fluxes related to the sun's output, and serve as a centralized relay system for information from a variety of other data-gathering devices, such as balloons, buoys and ground-based sensors.

To an extent, TIROS-N is a multi-national satellite. It is equipped with a stratospheric sounding device from Great Britain, while the collection system for the remote data sources comes from France. The satellite's photographs can be “read out” by relatively low-cost receiving stations now in use in more than 100 countries, and the GARP project involves at least 140 nations. □