

not meeting minimum standards for disaster preparedness would be denied Federal assistance for disaster relief. On the other hand, if the state's plan is approved, the Federal share of funds for implementing the plan would be increased to 90 percent.

Meanwhile, the National Weather Service is developing better forecasting methods. NWS is installing a number of automatic flood warning systems in the eastern United States. An enclosed float device somewhat like the bulb in a toilet tank activates an electric current when the water reaches a critical level. The electric signal goes to an alarm in a firehouse or police station. When the alarm is triggered, however, it is up to the community officials and the news media to see that the public is alerted.

The first such system was installed near Wheeling, W. Va., a little more than a month before Agnes struck, and NWS spokesmen say it performed beautifully. The Weather Service plans to install seven more of the systems within the next two years. □

## Scholarly access to Government documents

In 1958 President Truman made use of secret papers to document and publish his memoirs. These documents, still withheld from historians, have now been used by President Truman's daughter in documenting her forthcoming biography of her father. In 1970 President Johnson, during a televised interview, read from what he claimed was a classified document. Jack Anderson seems to have an unending supply of secret documents and memos. Daniel Ellsberg may eventually be condemned as a traitor for his involvement in the Pentagon Papers affair. From these examples it would seem that the present system of classification not only invites defiance of the system, but promotes unequal access to such papers among scholarly researchers.

For these and other reasons President Nixon was prompted last March to issue Executive Order 11652 on the classification and declassification of national security information and material. John Eisenhower, chairman of the Interagency Classification Review Committee, now reports that since the order became effective on June 1, the number of persons authorized to classify national security information has been reduced 63 percent, from 43,586 to 16,238. This may slow the rate of unnecessary classification and over-classification of Government documents, but some researchers feel it does not go far enough in declassifying and allowing scholarly access to such papers.

The Twentieth Century Fund, a re-

## An active sun in a normally quiet period



NASA

The sun is now in the portion of its 11-year sunspot cycle when activity is expected to be at a minimum. Yet the early days of August saw a severe disturbance on the sun that produced four major flares between Aug. 2 and Aug. 7 and severe magnetic storms on earth that disrupted communications and made the polar auroras visible at middle latitudes. "Of course," says David McLean of the Space Environmental Sciences Center at Boulder, Colo., "nobody pays really strict attention to the cycle in predicting specific events." A significant outburst can happen any time; in the statistical long run they cluster in the maximum parts of the cycle. The ones recorded in early August were among the most major ever recorded.

They all came from one active region of the sun, shown in the upper right of the photo (taken Aug. 10) just as the active area came around from the sun's far side. Their significance lies not so much in their optical as in their X-ray and radio properties. Optically flares are classed according to the area of sun they cover (0 the smallest; 4 the largest) and brightness (faint, normal, bright). The best of these was a 3 bright. General X-ray classifications run from C1 to C9, M1 to M9 and then X1 to X9. The Aug. 7 flare ran the X-ray sensors off scale at X5. But, says McLean, the very large centimeter-wave radio bursts that accompanied the flares were the real indication that this was an extraordinary event. The immediate cause of the magnetic storms is protons accelerated by the flare which reach earth 45 hours after the flare. These flares increased the proton count 800 times over the background level. □

search foundation in New York City, has recently issued a report that investigates the problems involved in independent scholarly research in diplomatic and military archives, the distortions that may result from unequal and privileged access to Government records and proposals for reform of the classification system.

The report, written by Carol M. Baker and Matthew H. Fox, describes the origin and development of the

classification process and the barrier it poses to scholars. The authors conclude that the Federal Government's 25-year embargo on military and diplomatic documents promotes public confusion and distrust about foreign affairs but does little to preserve the national security. They say the Truth in Government Act of 1971, proposed by Sen. Edmund S. Muskie (D-Maine), would be more comprehensive. The report calls for the establishment of an independent

body, appointed by and responsible to the President and Congress, that would supervise and review the security classification system. The least sensitive information would be declassified after two years. The most sensitive information would remain classified for no more than 12 years—except in rare cases.

The authors further point out that President Nixon's new reforms will be implemented by officials with a vested interest in secrecy. Any administration might well want to cover up or hide mistakes. An independent body could more objectively review classification systems as well as public requests for information denied by executive agencies. The authors argue that such a policy would not undermine national security but would help prevent controversies created by prolonged secrecy, leaks and dramatic exposés.

As for Presidential papers, "The debate about former officials and selected authors being privy to material closed to others is not dealt with in Nixon's order, and the problems they create will most likely continue," the authors say.

Throughout the report the authors take into account the need for secrecy in Government. But, they conclude, "The opening of Government archives to scholars would help restore credibility by making possible independent appraisals of the past and possibly providing guidelines for future policy." □

## Breeder reactor

A memorandum of agreement has been signed for the construction of the United States' first liquid metal breeder reactor intended to demonstrate the potential of breeder reactors as sources of electric power (SN: 1/22/72, p. 55). The site will be on the Clinch River in eastern Tennessee between Oak Ridge and Kingston. The plant will be built by the Tennessee Valley Authority and Commonwealth Edison of Chicago. Financing will be by a consortium of private utilities, TVA, Commonwealth Edison and the Atomic Energy Commission. □

## Metric bill

In 1866 Congress made the metric system of measurements legal in the United States. Sen. Charles Sumner opined that the new system would quickly oust the traditional English measurements. In 1972 a more forceful motion by Congress is in progress. Last week the Senate Commerce Committee unanimously endorsed S. 2483, a bill to make plans for a national changeover to what is now called SI (Système International). The change is expected to take 10 years. □

## How cryosurgery prevents tumor recurrence



Carlton E. Blackwood

*A cryoprobe freezes a tumor while three thermocouples record temperature.*

During the past decade cryosurgery—the freezing, then excision of tissue—has become a powerful clinical tool. It has been used to correct nervous disorders, such as Parkinson's disease, and to remove cataracts. More recently cryosurgeon pioneer Irving S. Cooper of St. Barnabas Hospital in New York City discovered that cryosurgery could prevent the formation of new tumors in patients, whereas regular surgery does not always do so. Other cryosurgeons discovered this beneficial effect of cryosurgery too. So two years ago Cooper and physiological chemist Carlton E. Blackwood, also of St. Barnabas, decided to probe the immunological basis for cryosurgery's ability to prevent tumor recurrence. They reported their findings at the recent annual meeting of the Society for Cryobiology in Washington.

First they found that if they excised tumors by regular surgery from the armpits of rats, then replanted the tumors in the same area of the animals' bodies, the tumors usually grew back. But if they excised the tumors with cryosurgery, the tumors rarely grew back. What, they asked, caused the difference? They examined the blood of the rats that had undergone cryosurgery and found that it contained antibodies called "complement-fixing antibodies." These antibodies are proteins. Along with related antibodies, they float in the blood and comprise what is called "humoral immunity." When tumors were replanted in the rats, even more of the complement-fixing antibodies were found in their blood. However the antibodies could not be found in the blood of animals that had undergone normal surgery. Nor did the number of antibodies rise in their blood after tumor replantation. Cooper and Blackwood conclude that complement-fixing antibodies contribute some protection against tumor growth after cryosurgery.

They believe, however, that "cell-

mediated immunity" probably provides greater protection against tumor recurrence after cryosurgery than does humoral immunity. In cell-mediated immunity, lymphoid cells pick up antigens (foreign substances), and the antigens trigger the production of antibodies that adhere to cell membranes. So they are now looking for antibodies on the membranes of tumor cells and lymphoid cells in animals that have undergone cryosurgery and normal surgery. The detection of antibodies on cell membranes would indicate that cell-mediated immunity is active.

Exactly how cryosurgery might set off humoral immunity or cell-mediated immunity needs exploration. Cooper and Blackwood conjecture that massive destruction of tumor cells by cryosurgery probably forces them to liberate antigens. The antigens cause the body to manufacture antibodies, which provide protection against a new tumor. Since regular surgery does not do such a thorough job in destroying tumor cells, the cells probably do not liberate antigens so generously. As a result, the body is not stimulated to make the protective antibodies. □

## Writing award

Robert J. Trotter, behavioral sciences editor of SCIENCE NEWS, has been chosen to receive an honorable mention in the 1972 National Media Awards competition of the American Psychological Foundation. The letter of citation, from the foundation's president, Henry W. Riecken, says the award honors "your year-long reporting on the behavioral sciences in SCIENCE NEWS magazine. The foundation's decision was based on the criterion that through your writing you have made a worthy contribution toward increasing the American public's knowledge and understanding of psychology." □