

plosion. A black hole of that mass would have a radius of only a few angstroms, no more than the size of a few atoms of ordinary matter. Coming down through the atmosphere it would have caused a shock wave and a fiery blue column (such a column was seen by witnesses of the event). The shock wave and heat would have caused the damage. In spite of the damage it does in the atmosphere, such a black hole would pass through the rock of the earth without any interaction because the forces that bind the rock together are much stronger than the gravitational interaction between the rock and the passing black hole.

The black hole would have come out of the earth in the North Atlantic in the region between 40 and 50 degrees north and 30 and 40 degrees west. As it emerged it would have caused a shock wave in the water and raised a column of water at the surface. The next thing that Jackson and Ryan want to do is check meteorological and other records to see if any such disturbance was recorded in the Atlantic at that time. □

Money and ethics in biomedical research

Biomedical research has recently been faced with several controversial issues that may soon be resolved. The questions, not surprisingly, have to do with money and ethics. In May the House, and last week the Senate, passed a bill (H.R. 7724) that would provide money for the training of young researchers and set up a commission to investigate and answer ethical questions.

The House version of the bill, which goes to conference next month, states that "National Research Service Awards [previously cut back by the Administration] should be the key element in the training programs of the National Institutes of Health and the National Institute of Mental Health." For this purpose, the bill would authorize more than \$200 million per year (SN: 7/7/73, p. 386).

Both versions of the bill call for an end to research on live, aborted human fetuses (SN: 4/21/73, p. 253). There is less concurrence, however, on another issue, the use of psychosurgery (SN: 5/12/73, p. 310). If this problem is not settled in conference, the bill provides an alternate solution. It calls for the establishment within the Department of Health, Education and Welfare of a National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. The 11-member commission would set ethical standards for all federally funded research. □

A 9,000-foot dive to watch the earth evolve

The Mid-Atlantic Ridge runs almost from pole to pole along the ocean floor, a double row of towering mountains with a vast canyon between them. The ridge and others like it are the markers of the living earth, for there the great plates of the planet's crust are being continually thrust apart to make room for new material thrust upward by the seething cauldron beneath the earth's outer layer. The ridge is a window to the bowels of the globe, and now, for the first time, man has been there.

For two years, Project FAMOUS—the French-American Mid-Ocean Undersea Study—has been in preparation. Ship-borne and towed instruments gathered magnetic, seismic and refraction data, made sonar maps of the bottom, took pictures and dredged up samples. Finally, on Aug. 2 of this year, the French bathyscaphe *Archimède* made its first descent, directly over the central valley of the ridge some 220 miles from the Azores (SN: 8/18/73, p. 104).

Before heavy seas drove the explorers away on Sept. 7, seven dives had been made to the floor of the rift some 9,000 feet below the surface. A prize of the final dive was a sample, weighing less than 10 pounds, of fine-grained basaltic rock still bearing the black, glassy traces of a geologically recent volcanic origin.

Due to the constant reshaping of the ridge area by the forces of the evolving earth, the terrain was a turmoil of crags and obstacles, making a tricky task for the pilot of the lumbering bathyscaphe. To be sure of where the data were coming from, *Archimède* was equipped with a precise navigation system that automatically kept a record of its path. This record, along with hundreds of photographs and television images—and the precious few samples—will be the subject of a week-



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Seafloor lava is earth's renewal.

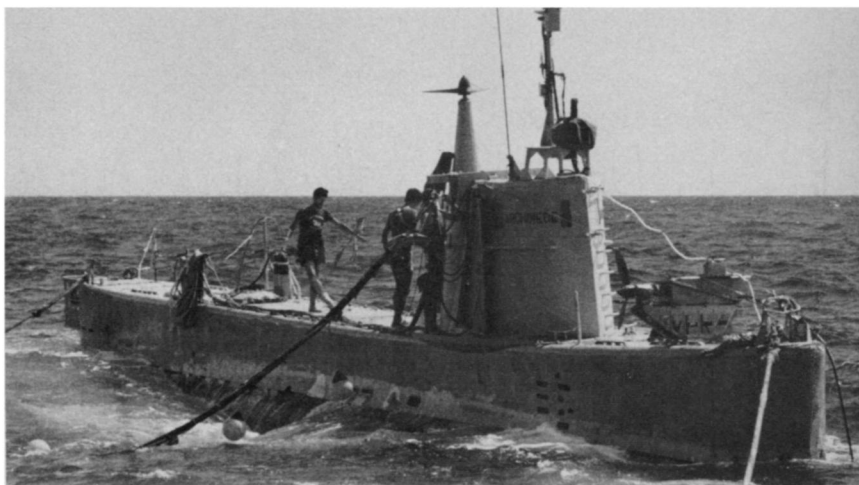
long meeting in France in October among the six scientists who rotated during the mission. After that the detailed study will begin.

Archimède, like the first manned spacecraft, was hardly an ideal vehicle for research—but it worked. "It's a large boat," says Robert Ballard of the Woods Hole Oceanographic Institution, who spent eight hours in the rift zone on the second dive. "It's 53 feet long—it can't be taken out of the water on the scene, it's got to be towed, it's a logistical nightmare and it's difficult to fix." These are expected problems with bathyscaphes, ungainly spheroids burdened by tumorous ballast tanks filled with gasoline. "But," Ballard says, "they were the first ones to come along that could go deep."

Next summer, however, FAMOUS will swing into high gear. Along with the bathyscaphe are to be two more maneuverable, better instrumented submersibles, both now in the final testing stages. Jacques Cousteau's brainchild, the SP 3000, will be operated by France's National Center for Ocean Exploration, and Woods Hole will operate the U.S. Navy's *Alvin* (which found the notorious missing hydrogen bomb off Spain in 1966), just fitted with a new titanium hull to double its operating depth to 12,000 feet. The only other craft capable of reaching the depths of the rift valley, says Ballard, is Trieste, another French bathyscaphe.

Archimède prepares for 9,000-foot descent to the Mid-Atlantic Ridge.

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By next June, when the enlarged operation begins, oceanographers and geologists will have much more detailed data from which to work, including a detailed photo-mosaic map, to be made by the U.S. Navy research ship Mizar in October, covering four square kilometers of the site. In addition, a towed magnetometer and other instruments will add to the tools being used to study the ongoing growth of the earth. □

Surgical treatment for senility shows success

Senility—transient memory loss—is a common problem in older people. There has been virtually no treatment for it, with the possible exception of oxygen (SN: 3/18/72, p. 188). Now, a team of Philadelphia neurosurgeons has come up with a simple surgical procedure that can reverse one kind of senility. This senility is caused by cerebral ventricles (cavities in the brain) enlarging and filling with fluid.

Henry A. Shenkin and his colleagues at Episcopal Hospital first diagnose a patient for enlarged ventricles. The surgeons remove fluid from the ventricles and replace it with air. The amount of air that fills them tells whether they are enlarged or not. If a patient has enlarged ventricles, he or she then undergoes a ventricular shunt. In this simple procedure, the surgeons insert a tube into the brain, run it down the neck under the skin and through the body into the abdominal cavity. The tube drains fluid from the ventricles into the abdominal cavity.

Shenkin and his colleagues have applied the technique to 28 senile patients. Eighteen (64.3 percent) of them have lost their senility. □

Wanted: More women in higher education

In a time of shortages of almost everything, it seems a shame to waste any natural resources. But that is exactly what is happening, says the Carnegie Commission on Higher Education. A large supply of superior intelligence in the United States is going unused. This supply is found among women, says the commission in *Opportunities for Women in Higher Education*, a report issued this week by commission chairman Clark Kerr.

The report points out that at each level of advancement within the educational system in the United States, the percentage of women who participate declines. Women constitute 50.4 percent of high-school graduates, 43.1 percent of those who earn bachelor's degrees, 36.5 percent of those with

masters and doctors degrees, 24 percent of those who are faculty members and 8.6 percent of those who are full professors. On the average, the commission estimates, women faculty members receive \$1,500 to \$2,000 less a year than do men in comparable positions.

To overcome these disadvantages, the commission favors the removal of "all improper barriers to the advancement of women; and active search for their talents, and special consideration of their problems and for their contributions." The report suggests, for instance, more mathematical training for women at the precollege level, and counseling that is free of the concept of male and female careers. At the college level, the report calls for opportunities for women to return to college after they have started their families. At the faculty level, the commission favors special efforts to recruit women and policies that provide for child-bearing and child-rearing leaves and ease rules that prohibit husbands and wives from working at the same institution.

In the commission's judgment, the 1970's are an important time for the improvement of the faculty status of women because the number of openings will decline as college enrollments level off and begin to decrease. But even with affirmative action programs, the report predicts that it will take until the year 2000 before women are proportionately represented in higher education. □

Leonard Carmichael dies; headed Science Service

In 1927, a Ph.D. holder from Harvard, teaching at Princeton, was offered a full professorship at another university at such an early age that he insisted on beginning the new appointment at a lesser rank to avoid antagonism about his youth.

In the early 1930's, a university department head was a co-developer of the electroencephalograph, at a time when some of his peers doubted that there was even an electrical brain pattern for the instrument to measure.

During World War II, a university president spent almost a year of nights on railroad sleeping cars commuting to Washington to organize recruitment of scientists for research in the war effort.

In 1953, a new chief administrator took over the Smithsonian Institution and began an 11-year tenure during which the museum's catalogued objects grew from 37 million to more than 57 million and the number of visitors almost tripled.

All of these—the prodigy, the scientist, the mobilizer, the museologist—were the same remarkable man: Leonard Carmichael, who died Sept. 16, of cancer, at the age of 74.

A bacterial cause for male infertility

Male infertility is complex and not always easily diagnosed. It can be caused by inadequate production of sperm, obstruction of sperm transit through the male seminal tract, unsatisfactory deposition of sperm in the female vagina or impotence (inability to attain or sustain an erection). These factors in turn can be caused by physical obstructions, hormonal imbalances, trauma, radiation, adrenal tumors, drugs or psychological disturbances.

Now Swedish bacteriologists have evidence that some cases of male infertility are caused by a kind of bacterium known as the T mycoplasma. Hakan Gnarpe and Jan Friberg of the University of Uppsala report their findings in the Sept. 14 NATURE.

T mycoplasmas were first associated with spontaneous abortions and stillbirths in 1970. Then Gnarpe and Friberg isolated T mycoplasmas from the semen of men with unexplained infertility. They suspected that the bacteria might have caused the infertility and gave the men antibiotic treatment. Afterward the wives of 30 percent of the men became pregnant. The next challenge was to find whether the bacteria actually attach themselves to the sperm cells of men with reproductive failure. Scanning electron micrographs showed that the bacteria indeed do so. □

Besides his many other accomplishments, which resulted in numerous awards including two Presidential citations, Carmichael served for 20 years on the board of trustees of Science Service, publisher of SCIENCE NEWS, including 12 years, from 1954 to 1966, as its president. Last year he was named its President Emeritus.

He was born in Philadelphia on Nov. 9, 1898. Just as in his early life he absorbed knowledge from all around him—he learned metalworking, for example, from his physician father's chauffeur—there was little if any time during the succeeding half century when Carmichael was not teaching, advising or directing several organizations at a time. He taught at numerous universities, headed the American Psychological Association and American Philosophical Society and served on many panels, boards and committees both in and out of government.

Lists of his credentials could fill a book, but an indication of his advanced thinking is his doctoral thesis, completed more than 50 years ago but later republished under the title, "*Heredity and Environment: Are they Antithetical?*" □