education will not go far to bail out colleges facing financial crises, but they are perhaps as much as could be expected in a year when the federal government has huge fiscal difficulties of its own. More substantial assistance may be provided later, when Congress completes action on the new proposals being considered.

Action ought to be completed before current authorizing legislation expires next 30 June. Indeed, the laws now on the books were originally scheduled to expire 30 June of this year. But Congress, familiar with its own tardy habits, last year tacked onto the Elementary and Secondary Education Act a provision extending authorization for 1 year to any program otherwise due to expire. This provision was intended to permit future funding for programs even if authorizing legislation was not agreed to in time to permit appropriations a year in advance.

Such temporizing reverses a long familiar pattern of congressional behavior. Usually appropriations are continued at the previous year's level, regardless of changes in new authorizing legislation, as a stopgap measure while Congress drags funding debates far into the fiscal year under consideration. Now, changes in education funding levels are being made while changes in education policies are stalled by disagreements.

When the appropriations for fiscal 1970 were not finally enacted until 5 March 1970, more than 8 months after the fiscal year had begun, Congress decided to separate Office of Education funds from the Health, Education, and Welfare Department's budget. As a result, fiscal 1971 education appropriations cleared Congress 28 July 1970 and were enacted over the President's veto on 18 August, 4½ months before enactment of the HEW appropriation. Even so, educators were held in suspense regarding federal aid until the eve of the academic year. By completing action on 30 June this year, Congress has simplified life somewhat for institutions anxious to plan ahead.

But colleges and universities remain in the dark with regard to fundamental changes in federal aid currently under consideration. Many institutions are now forced by budget stringencies to make difficult choices with long-range consequences. These decisions would be easier if they could predict the outcome of the debate in Congress.

The decisions Congress must make would be easier if there were plenty of money to go around. The resulting legislation, however, would not necessarily be more sound, because compromises which give something to every cherished program are easier when the economy is booming. Under present conditions, Congress can be relied upon to take a hard look at novel proposals. In the long run, such an approach may pay dividends even though it delays help now urgently sought.

It may also shift some of the power over education policy from the appropriations committees back to the legislative committees. At present, programs are authorized at levels so far above available funds that the appropriations committees have considerable discretion in deciding just where they will apply the ax. In 1968 Congress appropriated 60.5 percent of the money it had authorized for education; in 1969 the ratio fell to 46.3 percent, and then to 37.3 and 36.7 percent in the following years.

Whatever new forms of federal aid are finally enacted, the appropriations process will still, of course, have the last word. As a result, the more colleges and universities gain from the new laws, the more they will have to hold their breath as Congress makes up its mind each year on how big a bone it will throw them.—D. PARK TETER

Pentagon Papers: Repercussions for Rand and Other Think Tanks?

Defense Secretary Melvin R. Laird added a footnote to the Pentagon papers on 1 July when he ordered Air Force security officers to take custody of all classified documents at the Rand Corporation. Laird's action was based on charges that Daniel Ellsberg had unauthorized possession of government documents in 1969 while on the staff of Rand at Santa Monica.

The immediate effect of Laird's order on Rand operations seems to have been minimal; Rand researchers continue to work as usual with classified materials. But there is apprehension at Rand and at other government-sponsored research organizations that new security regulations could restrict their access to classified information which they regard as essential to effective operation in the defense sphere. At the very least, the Ellsberg incident brings to public notice the close and increasingly complicated relationship between the military patrons and the "think tanks" they have created.

Rand, which was set up by the Air Force after World War II, is the prototype of the independent, nonprofit research organization devoted primarily to the analysis of military problems, and it is doubtless the best known of the approximately 70 so-called Federal Contract Research Centers (FCRC's) that serve government agencies, mostly in the defense area. Some FCRC's deal primarily with systems management or hardware development and have larger budgets and staffs than does Rand, but Rand's identification with influential strategic studies and the luster of names of many Rand alumni have made Rand practically a synonym for think tank. Daniel Ellsberg is an alumnus who brought Rand a kind of publicity it would willingly have foregone, but Rand has figured in the careers of many people who have gone on to important posts in government and universities. Rand probably reached a peak of prominence in the early 1960's when it provided the theoretical basis of the systems-analysis techniques which Robert S. McNamara applied in managing the Pentagon, and Rand then also supplied a number of key civilian Pentagon analysts and managers. But the pattern continues: last week the name of James Schlesinger, a Rand alumnus and now an official in the Office of Management and Budget, was being mooted as a successor to Atomic Energy Commission Chairman Glenn T. Seaborg.

Although work for the Air Force remains the foundation of Rand activi-

ties, Rand was the leader among the think tanks in diversifying its research into nonmilitary areas, including work for city and state governments and foundations. Over the years Project RAND, Rand's original block grant from the Air Force, has been continued but, in recent years, has been reduced. Project RAND funds peaked at about $15 million in the late 1960's and is down to about $11 million for the current year. Rand's total budget is some $27 million, with the Air Force portion representing 43 percent, nondefense work over 20 percent, and other work on national security problems the balance.

A major recent departure for Rand was the establishment of the New York City–Rand Institute, a separately incorporated entity set up to work exclusively on problems of urban life and government. Despite some rough patches caused by the city's financial troubles, Rand East seems to have established itself firmly.

At Santa Monica, Rand is in the process of putting a graduate institute into operation. Rand has achieved "corresponding status" from accrediting authorities to permit it to operate a graduate program in policy analysis. It will be a Ph.D.-level program for people with master's degrees and will be operated in cooperation with universities which will actually grant the degree. So Rand is taking steps to institutionalize the university atmosphere that it has always coveted and cultivated.

The organization most nearly comparable to Rand in its FCRC peer group is the Institute for Defense Analyses (IDA), which has a special, although not exclusive, relationship with the Office of the Secretary of Defense and such Defense Department agencies as the Advanced Research Projects Agency. The other military services have followed the Air Force lead in fostering Rand-like organizations, and the links between the Army and the Research Analysis Corporation (RAC) and between the Navy and the Center for Naval Analyses (CNA) resemble the Rand–Air Force model. IDA, RAC, and CNA all have their main offices in the Washington area, however, in contrast to Rand which has a Washington office but carries on its main operations in Santa Monica.

IDA has followed Rand's footsteps in diversifying its work (*Science*, 17 May 1968) and nonmilitary projects now account for about 10 percent of the organization's total annual budget. Unlike Rand, however, IDA has limited its new patrons to federal agencies, military and civilian, and, like a number of other FCRC's in recent years, has seen its budget dip from a high of about $15 million in 1967 to about $12.8 million last year. IDA has done studies for the Justice Department and the departments of Housing and Urban Development and Transportation and is now carrying out work for the Post Office, but the organization's trustees have indicated definite limits on work that shall be done for others besides IDA's Defense Department patrons.

The slump in federal funding of the think tanks has not been a simple function of the budget squeeze induced by the Vietnam war. In the early 1960's Congress began to display a rather sharp skepticism toward the FCRC's, which at that time were increasing rapidly in number and in budget. There have been periodic flurries over FCRC salaries, particularly those of top executives, and also fundamental concern expressed in Congress over the possibility that important policy decisions were, in effect, being made outside government.

In the middle 1960's Congress directed the services to put ceilings on the total funds going to the FCRC's, and in 1967 these ceilings were seriously enforced. The result was that the FCRC's ceased to be a booming growth industry, and, as inflation took its toll, a number of think tanks have allowed staff to be reduced by attrition or in some cases have cut back the work force. More recently, Congress

POINT OF VIEW

NSB Promotes Environmental Science

In its third annual report to Congress, entitled "Environmental Science: Challenge for the Seventies," the National Science Board urged "A Federal Mechanism . . . to provide for the promotion and support of environmental science as a whole." The Board defined "environmental science" as "the study of all the systems of air, land, water, energy, and life that surround man. It includes all science directed to the system-level of understanding of the environment, drawing especially on such disciplines as meteorology, geophysics, oceanography, and ecology, and utilizing to the fullest the knowledge and techniques developed in such fields as physics, chemistry, biology, mathematics, and engineering." The following excerpt is from the report's section on "The Basic Issue."

A central problem . . . exists with respect to environmental science, one that can best be illustrated by comparing the situation today with the circumstances that prevailed at the time of Sputnik. A decade ago the state of relevant science and technology—physics, chemistry, propellants, control systems engineering, mechanical design, communications, manufacturing capability—was such that an immediate effort could be mounted to meet a perceived challenge, and technological goals could be stated for the decade ahead. Today again there is a perceived challenge, more serious and more generally shared than the one a decade ago, and one that science, environmental science, cannot provide the tools to meet. This is a matter of the utmost importance—both for the United States and for the world as a whole.

There is a clear and urgent need for the establishment of a national program to develop environmental science to the point where it can contribute decisively and authoritatively the information, the interpretations, and the predictions that are needed for wise public decision on all matters relating to the environment within which man is constrained to live and to look forward to a constructive future. At the same time, there is a corresponding need for vigorous and expanded programs of research on the social, behavioral, economic, political, and administrative arrangements and institutions that are essential, if the results of environmental science are to be effectively applied and if the crucial physical and biological issues are to be recognized.

has put limits on the salaries for FCRC staff and executives. Federal salaries have advanced rapidly in recent years, so that the favorable pay status of FCRC professionals compared with civil service professionals which prevailed in the 1960's appears largely eroded. Or so FCRC officials aver.

Apparently to ameliorate the federal hold-down on think-tank financing, Secretary Laird in March of 1969 authorized a policy statement which, in effect, encouraged the FCRC's to seek nondefense research so long as diversification did not dilute the FCRC's effort on national security work.

One result of the trends in federal policy and funding has been the decision of the RAC to seek to change its status as a nonprofit organization to that of a profit-making corporation, with its employees holding at least two-thirds of the stock. The proposal now being considered by the Securities and Exchange Commission would provide for repayment to the government of the appraised net worth of the enterprise. The change would presumably enable RAC to operate more freely in the knowledge market, although its clear assumption and hope is that the Army will continue to be chief user of the organization's services.

The Vietnam war and the antimilitary backlash it has produced have obviously brought a variety of pressures to bear on the think tanks. For one thing, there is a change in the character of work—when shooting is going on, think tanks are asked to work more on supply and logistical problems and the analysis of combat operations than on the longer-range tactical and strategic studies which the researchers tend to view as more interesting and "elegant." Then there is the change in the social climate and in public and official attitudes toward think tanks and the people who work for them.

Cross Section of Professionals

It is probably significant that the Ellsberg incident marks the first instance of a think-tank staff member being conspicuously involved in a major antiwar incident. This is not to say that there have not been tensions in organizations with staffs which are made up of a cross section of professionals drawn from the physical sciences, mathematics, and the social and behavioral sciences and which probably reflect all but the far Left of the spectrum of opinion and prejudice found in universities. One incident, which was minor in that it went relatively unnoticed, does reveal something of the ambivalence felt in Congress toward the FCRC's with their unmistakable shades of academe. The incident occurred last year when members of the House Appropriations defense subcommittee learned that an employee of the CNA had been involved in a protest in Washington against the payment of taxes to support the Vietnam war. In the following excerpt from the hearings on 28 April 1970, Representatives Louis C. Wyman (R–N.H.) and William E. Minshall (R–Ohio) questioned Navy assistant secretary for R & D Robert F. Frosch in a way that reflects fairly widely held congressional qualms about the jurisdiction of the military over their contract advisers.

MR. MINSHALL. What jurisdiction do you have over this organization and this man, if any?

DR. FROSCH. I have jurisdiction only over the program and funding of the organization. I do not have jurisdiction over the security clearances of the individual members of the organization.

MR. MINSHALL. Do you have jurisdiction over hiring and firing of individuals?

DR. FROSCH. I do not.

MR. MINSHALL. Who does?

DR. FROSCH. The University of Rochester, who is the contractor operating the organization.

MR. WYMAN. If you were to express to the Secretary of the Navy your disinclination to have this man continued—not that I am saying he shouldn't be at this point—I doubt if the University of Rochester would continue employing him. Is this not the case? He is not protected by civil service in the sense that he has a classified position with civil service rights?

DR. FROSCH. I think I would be very careful not to make such an expression to the University of Rochester no matter what is my view as to the propriety of his employment because that would be, I think, quite an improper interference with the contract and with the contractor.

MR. MINSHALL. Well, Doctor, if he worked for a strictly private corporation and did this, I then would not raise the questions that I have, but even though he is under the direct hire of the University of Rochester, he really works for the Department of Defense.

DR. FROSCH. I thought one of the things we were all trying to protect was the right of an individual to have private opinions, political and otherwise.

MR. WYMAN. There is a difference between a private opinion and riding around with a placard advocating to other people that taxes should not be collected or apportioned to the support of the Vietnam war. That ceases to be a private opinion. That is just like Justice Douglas' activity. It is different, of course, only because he is in a higher position, but it is the same situation.

DR. FROSCH. I presume if there is a legal difference that these differences in the end will be adjudicated by the courts?

MR. WYMAN. The whole point is, you don't have to commit a crime—your tenure working for the government of the United States is not contingent upon your violating a law or prosecution by the Department of Justice. If you have somebody that you think is interfering with the war effort, all you have to do is pass the word and he is going to leave. I understand your position at the present time is that you are disinclined to so pass the word because you consider this situation to be an individual free private expression of opinion on his part, but at the same time there are those of us here who do not agree.

DR. FROSCH. I consider this to be an expression of an opinion by somebody who is not an employee of the U.S. government but is the employee of a contractor of the U.S. government, and I won't interfere with this contractor any more than I will interfere with any other contractor, whether he be performing studies or producing hardware.

Considerably harsher things were said at the hearing. The employee in question continued to work at CNA for more than a year afterward, but was among those let go when CNA was forced by budget cuts to reduce its staff by some 25 percent this year.

The think tanks are likely to give Congress and the military further nervous or exasperating moments. The military in the last three decades has learned to live with their defense intellectuals, but there are doubtless people in the Pentagon who would like to see Rand get its comeuppance over the Pentagon papers.

As for Rand and other think tanks, a governing assumption has been that to recruit and hold talented people it is necessary to tolerate a variety of sartorial, tonsorial, and—though there are limits to pluralism—even a variety of ideological styles. Rand officials acknowledge that there always have been many able people who would not choose to work for an organization with Rand's links to the defense establishment, but they insist that such self-selection out still leaves an ample supply of high caliber prospects.

Hiring at Rand is not done centrally but is undertaken by the departments organized on disciplinary lines. Security clearances, which are required for all employees, are handled exclusively by federal authorities, and Rand says that regard for merit rather than security considerations is what guides the Rand hiring process.

Rand spokesmen say that the Vietnam war has caused no perceptible

falling off in the quality of recruits to the corporation, although they admit that the current tightness of the job market has probably worked in Rand's favor. They also make a point of saying that the increasing amount of nonmilitary research being done at Rand has proved a great attraction in hiring, particularly among younger people. At the same time, they note that only a few new employees have specified they will work on nonmilitary projects exclusively.

As for breaches of security, the prevailing view in the think tanks seems to be that risks are inevitable. As one IDA official put it, "Ultimately you have to place faith in the guy who does the work and has access to the documents." That is, unless you do things like put a guard on the Xerox machine, he added half-facetiously. "The Ellsberg case could have happened anywhere," he said. "Once a guy is cleared you have to trust him."

Think-tank sources in the Washington area say there have been no extraordinary checks of classified information since the Pentagon papers case erupted. As one insider said, "We've had no wall-to-wall inventory," or any change in procedures. Several FCRC sources claimed that security regulations on classified material are more tighly observed in the think tanks than in the Pentagon and in many federal laboratories.

Rand officials and Pentagon sources decline to discuss the Ellsberg case while it is before the courts, but the incident has obviously given Rand a sharp sense of insecurity. Control of classified information at the think tanks is governed by the industrial security laws which cover defense plants and defense contractors generally, and any extensive changes in the Industrial Security Manual that limited think tanks' access to classified materials would be a very serious matter for Rand and its peers.

Rand is an organization that lives, so to speak, by its wits, and its relationship with the Air Force and other military patrons depends, of course, on a spirit of confidence as well as on observance of the letter of security regulations.

The Ellsberg case is perhaps the most serious shock yet given this complicated relationship. For Rand staff members the case serves as a reminder of potential difficulties in reconciling loyalty to the nation as defined in security regulations, individual conscience, and loyalty to one's organization.

For Rand at large, the problem is different. Rand styles itself an "independent research organization" and justifies this label by pointing out that it often gives the Air Force information and advice it doesn't like and may not follow. It is fairly well known, for example, that in the 1960's some Rand studies on Vietnam, particularly on bombing effects and counterinsurgency problems, ran counter to the policies followed by the Air Force and the Administration. The impact of the Ellsberg case on Rand's willingness to proffer unpalatable analyses and on the willingness of the Air Force to tolerate pluralism in policy discussions can only be a matter of speculation at this point, but it is a question worth raising.

The realities of the peculiar relationship between Rand and the Air Force would appear to be that they still need each other. On the one hand, an era when serious action on arms control and disarmament seems possible and a rapprochement with China conceivable is a time when the military needs its Rands; for Rand there appears no practical possibility that nonmilitary research will soon provide the volume or continuity of funding that Rand requires. So mutual need is likely to continue to militate against any basic change in the relationship.

—JOHN WALSH

RECENT DEATHS

Roger Adams, 82; retired head, chemistry department, University of Illinois; 6 July.

Guinevere S. Chambers, 54; professor and chairman, child development and child care department, School of Health Related Professions, University of Pittsburgh; 2 July.

Manton Copeland, 89; retired professor of natural science, Bowdoin College; 22 May.

John C. Cunningham, 61; chairman, ophthalmology department, College of Medicine, University of Vermont; 19 June.

John B. Enright, 61; former professor of veterinary public health, University of California, Davis; 15 June.

Stanley B. Fracker, 82; retired entomologist, U.S. Department of Agriculture; 15 June.

Albert Gail, 62; former professor of aeronautical engineering, Georgia Institute of Technology; 28 May.

Arthur W. Grace, 77; retired professor of dermatology, Long Island College of Medicine; 1 July.

Helen Hart, 70; professor emeritus of plant pathology, University of Minnesota; 2 May.

Isabel W. Howell, 54; professor of biology, Knoxville College, 4 March.

Alvin Johnson, 96; president emeritus, New School for Social Research; 7 June.

Paul Karrer, 82; Nobel Prize winner and former professor of chemistry, University of Zurich; 18 June.

William S. McCann, 81; first chairman, medicine department, University of Rochester Medical School; 10 June.

James E. McDonald, 51; professor of meteorology and climatology, and senior physicist, Institute of Atmospheric Physics, University of Arizona; 13 June.

Frank J. McGowan, 73; former clinical professor of surgery, New York University Medical School; 13 June.

Robert J. McIlroy, 59; professor and dean of agriculture, University of Queensland, Australia; 29 March.

Faith S. Miller, 62; associate professor of anatomy, Tulane University School of Medicine; 11 June.

Irving Miller, 54; former associate professor of epidemiology and community health, mathematics and statistics, University of New Mexico; 27 June.

Julian C. Miller, 75; professor emeritus of horticulture, Louisiana State University; 13 April.

Chester O. Newlun, 83; former president, Wisconsin State University; 2 May.

Vasily V. Parin, 68; physiologist and member, Soviet Academy of Sciences; 15 June.

Walter J. Richards, 52; chairman, psychology department, University of Arkansas; 17 April.

Paul L. Risley, 65, former chairman, biology department, University of Oregon; 10 May.

Wendell M. Stanley, 66; professor of molecular biology and biochemistry, University of California, Berkeley; 15 June.

Edwin A. Whitman, 83; associate professor emeritus of mathematics; Carnegie-Mellon University; 16 June.

Emil Witschi, 81; professor emeritus of zoology, embryology, and endocrinology, State University of Iowa; 9 June.

Richard L. Wolfgang, 42; professor of chemistry, Yale University; 19 June.