vote funds for research on a steeply rising curve for a decade and, more recently, to pass a variety of bills underwriting education in the health professions.

There are signs that this congressional interest could turn critical. On 1 August, when the Health Manpower bill was passed, the House also acted favorably on a bill authorizing the establishment of a National Eye Institute as part of NIH. Representative William T. Cahill (R–N.J.) used the occasion to elaborate a charge that federal support of medical research has had an adverse effect on the production of medical manpower. Cahill is a lawyer and a member of the Judiciary Committee, and his concern seems to have been triggered partly by his committee's findings on the dependence of U.S. medicine on foreign-trained physicians. Cahill developed the theme that "research has diverted physicians away from the patient and the hospital and into the laboratory." He traced the rise in medical research funds in recent years. And he told how he had found that the University of Pennsylvania medical school — the school closest to his South Jersey constituency—had, despite a flow of research and construction grants, produced slightly fewer medical graduates in 1967 than it did 10 years earlier.

Cahill also found ammunition in the investigations of the House Government Operations Committee's intergovernmental relations subcommittee, chaired by Representative L. H. Fountain (D–N.C.). Fountain has been a persistent critic of NIH administrative practices, and in its last report (*Science*, 3 November 1967) his committee also blamed research grants for "excessive diversion" of professional personnel from teaching and medical practice to federally supported research.

These allusions drew a pointed rebuttal from Representative Melvin R. Laird (R–Wis.), a dominant minority member of the Appropriations subcommittee which oversees NIH funds. As part of his endorsement of NIH management, Laird read into the record testimony presented before his subcommittee by retiring NIH director James Shannon. Fountain responded sharply later in the debate and also inserted a lengthy recapitulation of his subcommittee's findings in the *Congressional Record*.

This byplay revealed a certain tension between the Fountain subcommittee, on the one hand, and the Appropriations and Commerce subcommittees which handle health education legislation, on the other. And it is known that Fountain would be inclined to investigate the effects of research funds on medical teaching but feels that, in present circumstances, insiders are not disposed to speak frankly on the subject.

It should be noted that Cahill kindled no revolt in the House. He himself voted for the Health Manpower bill when it rolled through and was apparently speaking mainly for the record.

Medical research is not in conspicuous trouble in Congress, but its halcyon days are probably past. With the Fogarty-Hill alliance gone from Capitol Hill and Shannon retiring, the fortunes of medical research will be in the hands of new and untried management. The legislation explosion in the health education field has given these programs greater visibility and much more money. (The 2-year price tag on the Health Manpower Act topped $1 billion.) With the squeeze on funds affecting all civil spending, it is reasonable to expect that, in the health sector, some competition for funds will evolve between research and teaching.—JOHN WALSH

Space Science Board: Advisers Cool on Sending Men to Planets

Looking beyond the moon, the National Aeronautics and Space Administration is no longer, in this tight-budget era, actively considering manned voyages to Mars. Its budget now down by more than a billion dollars from a year ago, NASA will, at most, carry out a modest series of unmanned planetary flights in the 1970's. If its budgetary prospects should later improve, the agency's visions of manned planetary expeditions may well return. Yet much of the support earlier given such aspirations by key scientists seems to be slipping away.

Until now, many of the scientists closest to the space program—especially those serving on key official advisory bodies—have held that, ultimately, men would have to visit the planets if scientific exploration of those bodies was to be fully productive. But a new report just released by the National Academy of Science's Space Science Board (SSB) says that automated spacecraft should be able to do the job.

Prepared by an SSB study group headed by Gordon J. F. MacDonald (vice-president for research of the Institute for Defense Analyses), the report sets forth priorities for a program of planetary exploration for the period 1968–75. It alludes to the fact that SSB and the space science and technology panels of the President's Science Advisory Committee (PSAC) have, in the past, recommended various programs intended to give the United States the option of eventually undertaking manned planetary flight. It then adds:

> These [recommended programs] include biomedical programs exposing man to space conditions for long periods (100 to 200 days) in earth orbit to determine whether he is qualified to undertake planetary missions (these missions involve round trips of about 700 days). Such biomedical qualification requires the development of special vehicles since neither the present Manned Orbiting Laboratory [an Air Force project] nor Apollo could easily be adapted for long-term missions; needless to say, these programs involve substantial funding.
>
> We were unable to identify a need in planetary exploration, in the foreseeable future, for the unique abilities of man. . . . In the face of a limited space budget, we favor reallocation to the unmanned exploration of the planets of those resources directed to efforts preparatory to a manned planetary program. The rapid development of technology suggests that full automated systems of substantial complexity will be available for planetary exploration and that this technology should be capable of answering the major scientific questions that we can now pose about the planets.

A POINT OF VIEW

The Space Science Board of the National Academy of Sciences, in the new report prepared by its study group on planetary exploration, is urging that the Academy, NASA, and the Department of State approach Soviet scientists informally about the possibility of the United States and the Soviet Union planning their planetary investigations jointly. In making the case for a coordinated U.S.–Soviet effort in this field, the study group observes:

Duplication of effort may have been valuable during the early stages of space exploration because of the high probability of failure. The great reliability of the present systems resulting from continued experimentation and advances in technology has eliminated the need for repetitive experiments. In the same sense, the rapid development of a broad area of space activities dilutes the prestige value to any nation of a particular space success. . . . Only if one nation were completely to dominate an area of exploration such as planetary studies would the present balance of space-related prestige be upset. . . . Planetary exploration may be the earliest and most suitable candidate for . . . combined planning efforts. Journeys to the planets are expensive, they require long lead times because of limited opportunities for making the journey and great sophistication in instrumentation if the instruments are to survive the lengthy voyage. Furthermore, planetary investigations have no relevance to national security, nor has any nation as yet made a national goal of planetary exploration.

The report was endorsed by the Space Science Board itself, and the panel that prepared it included three SSB members—MacDonald; Harry H. Hess (SSB's chairman), Blair professor of geology at Princeton; and Allan H. Brown, head of the biology department at the University of Pennsylvania. In its Woods Hole summer study of 1965, SSB had concluded that manned planetary missions would be necessary. The working group on the role of man in space research, of which Hess was a member, stated, "scientifically satisfying studies of the planets will require the presence of scientists, preferably on the planetary surface where they can make direct observations.

"If that is not feasible," the group said, "they should at least be in a spacecraft orbiting closely enough to the planet so that communication time delay and power bandwidth considerations will not seriously limit the performance of remotely controlled instrumented vehicles on the planet. It is clear that here man is essential."

In February 1967, PSAC's space science and technology panels — on which MacDonald and three other SSB members served—spoke similarly. They indicated that the search for extraterrestrial life, especially, was likely to require man's presence on or near Mars.

MacDonald, though he was on the PSAC space science panel and took part in the SSB study of 1965, told *Science* last week that he has never favored manned planetary missions. His reasons for being opposed to such missions, he said, are threefold: (i) the investment required would be far greater than that required for Apollo, the manned lunar program, which will cost an estimated $23 billion; (ii) the technological advances stimulated or produced by a manned planetary program—over and beyond those attributable to Apollo—would not be sufficient to provide a major justification; and (iii) rapid advances are being made in automated spacecraft technology.

But, clearly, as the MacDonald panel itself implicitly acknowledged, the major reason for discounting the importance of man's role in planetary missions is that the current scarcity of space funds has forced it to rethink priorities. MacDonald cites the proposed earth-orbiting Saturn V workshop as a case in point. The workshop project, still in the study stage, has as a major objective the testing of man's ability to survive and function effectively under conditions of prolonged space flight. In MacDonald's view, this project—which he believes to be directed principally at problems of manned planetary flight—should be dropped. Funds that might have been allocated to it should be diverted to the unmanned planetary program instead, he feels.

According to NASA officials, however, the workshop project would have a number of important scientific and engineering objectives, most of them either unrelated to manned planetary flight or not exclusively related to it. In fact, agency officials say that, except for some mission studies undertaken in the past, they know of no NASA project that is chiefly concerned with manned planetary flight.

The MacDonald panel recommended a planetary program which would cost up to $200 million or more a year—or between two to three times the amount NASA will spend this year on planetary exploration. Among the recommended projects are two Mariner-type missions already in NASA's program (an orbiter mission in 1971 and an orbiter-lander mission in 1973), plus various other missions to Mars, Venus, Mercury, and other planets. The panel also calls for construction of additional facilities for ground-based planetary astronomy, including an optical telescope in the Southern Hemisphere, a major new radar observatory, and a large infrared telescope.

These recommendations have been well received by Donald P. Hearth, NASA's director of planetary programs, and other officials responsible for space sciences. They cannot be carried out, however, through the diversion of funds from activities aimed at manned planetary flight if, as NASA officials say, such activities do not exist. And it seems clear that, so long as the Vietnam war continues, neither the administration nor Congress will provide much in the way of additional funds for planetary missions.

Last week the space agency announced an operating plan for fiscal 1969 which assumes that its total new obligational spending during the year will be even less than the $4 billion Congress is expected to appropriate (with well over half that amount going to Apollo). The effects of the reductions, which are necessary because of the administration's obligation to have a spending cut accompany the new tax increase, are being felt widely within the agency. For example, plans to continue production of the Saturn V moon-rocket following Apollo have

been canceled. Moreover, activities pointing toward extended manned lunar exploration after the initial moon landings are now limited to studies. And while the 1973 Mars mission has not been eliminated, fewer instruments will be landed on the Martian surface than had been planned, and fewer scientific data will be returned.

In sum, the MacDonald panel's recommendations are unlikely to be of immediate consequence. By discounting the scientific importance of manned planetary missions, however, the panel report may, in the longer term, have a perhaps unintended political impact. The war accounts largely for the scarcity of money for the space program today, but the demands of the urban crisis and other domestic problems will compete formidably with NASA for funds tomorrow.

As many have observed, the glamor of space exploits is wearing off, and some people now yawn at talk of a U.S.–Soviet space race. In such circumstances, NASA will want to offer the strongest possible scientific justification for its proposals, especially those which carry a high price. To offer such justification may not win political approval for a project, but failure to do so may well kill it.—LUTHER J. CARTER

University of Hawaii: More Storms Lash the Palmy Groves of Academe

On 3 September a two-man team from the American Association of University Professors (AAUP) will begin its on-the-scene investigation of the hotly disputed case concerning the tenure of Oliver M. Lee at the University of Hawaii. This ad hoc AAUP committee, composed of Samuel H. Baron, chairman of the history department at the University of California at San Diego and Glen A. Love of the English department at the University of Oregon, is expected to have its report completed within a few months. If the AAUP's Committee "A" decides to publish the report in the AAUP Bulletin, and if, then, it votes to recommend censure of the University of Hawaii, such a recommendation will be considered by the AAUP's annual meeting in April.

If censure is approved, it will be a severe blow to the upwardly mobile University of Hawaii. Like many other universities, Hawaii has some trouble attracting topflight faculty members, a condition which is aggravated by its somewhat isolated location, by the steep cost of living in Honolulu, and by a salary scale that is not exceptionally high (the average faculty member at Hawaii receives a salary of $11,589, according to the latest AAUP survey) As one Hawaii professor, George K. Simson, wrote earlier this year, "How many factors beyond censure and low pay does a smart professor need in order to cross off Hawaii?

The man around whom the dispute arose is Oliver M. Lee, a political scientist who is a militant critic of the Johnson administration on Vietnam. Lee has been a controversial figure at the University of Hawaii almost from the time he arrived 5 years ago. The controversy surrounding him became much sharper in early June of 1967, after a student group for which Lee served as adviser issued a statement urging infiltration and forceful disruption of the U.S. armed forces. Shortly before the statement was issued, Lee had been given a letter indicating the intention of the university administration to grant him tenure. After the furor about the statement of the student group, the university administration revoked the letter of intention to grant Lee tenure. In the months that have followed, the regents have consistently upheld the administration's decision, while faculty groups have questioned it. On 22 December the Faculty Senate Hearing Committee concluded that the administration had failed to follow due process in dealing with Lee and his department and that it did not have reasonable cause to revoke the letter of intent to Lee. On the next day, Thomas H. Hamilton, protesting the committee's decision, shocked the state by announcing his resignation as president of the university. (For a description of some of the earlier events and details of the case, see *Science*, 1 March.)

The tumult which followed Hamilton's resignation did not end quickly. During late May the usually placid campus was rocked by 11 days of demonstrations, with students demanding review of the decision on Lee, and occupying, Columbia-style, the administration building at the main Manoa campus. On 21 May police arrested 152 students and faculty members (including Lee) who refused to leave the administration building. To pacify the rebellious students, the regents came on campus the next day to announce that Hamilton's resignation was effective immediately; this brought cheers from the demonstrators. The regents then slipped the students the bitter pill: the announcement that Lee would not be granted tenure and that his employment would be terminated immediately, with a year's severance pay thrown in. Lee is currently teaching at the university's summer school. When this assignment ends, he will stay on in Honolulu without an academic job to fight his case, as he said, "until my rice bowl is empty."

In late June, the other central administration figure in handling the Lee case, W. Todd Furniss, dean of the College of Arts and Sciences, announced his resignation. Furniss had been criticized by the demonstrating students, by some faculty members, and by the Honolulu press for his role in the affair. In January he will take a post in Washington as director of the American Council on Education's commission on academic affairs. (Shortly after the regents proclaimed their immediate acceptance of Hamilton's resignation it was announced that Hamilton, who served as president of the State University of New York system before coming to Hawaii in 1963, had accepted the position of head of the Hawaii Visitors Bureau.)

One of the points at issue in the dispute had been the refusal of the