convenience, these schedules have been approximated by reference to the single income threshold for a nonfarm family of four. In this article, therefore, "near-poor" refers to those families falling below the near-poverty level (centered in 1966 on an income of $4345 for a nonfarm family of four), while "poor" refers to those families that fall below the poverty level (centered in 1966 on an income of $3335 for a nonfarm family of four). The term "low-income" is used to include both poor and near-poor. In addition to these standards, there is the concept of "medical indigency," the term used to describe those families and individuals who cannot afford private medical care. Officially formulated medical indigency standards establish eligibility for publicly financed medical care and vary widely from state to state. In most states, the levels are quite low and are based on a concept of paying mainly for treatment of major illnesses. In the absence of a national standard of medical indigency, and particularly of one that would accurately define those who are deterred by lack of income from purchasing an elective, preventive health service such as family planning, there appears to be little choice but to adopt the Social Security Administration's near-poverty level to define medical indigency, although many health workers regard it as too low to identify realistically those who cannot afford private medical care.
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30. "Excess fertility," following the concept employed in the 1965 National Fertility Study, is the medium estimate of births that were unwanted at conception by either one or both parents.

NEWS AND COMMENT

Cancer Politics: NIH Backers Mount Late Defense in House

The tussle to wrest control of cancer research away from the National Institutes of Health has moved from the Senate to the lobbies and committee rooms of the House. In July, a bill to set up the National Cancer Institute as an agency virtually independent of the NIH swept through the Senate by a 79 to 1 vote, and seemed assured of an equally decisive victory in the House.

The tide was abruptly stemmed last month when Representative Paul G. Rogers (D–Fla.), chairman of the House Subcommittee on Public Health and the Environment, introduced a counterbill cosponsored by a majority of his subcommittee. Whatever compromise emerges in the next few weeks between the Rogers bill and that passed by the Senate may radically affect the long-term future of biomedical research, insofar as the progress of science is subject to administrative influences.

Few issues have so united the biomedical community as the proposal to remove the National Cancer Institute from NIH and establish a NASA-like agency charged with conquering cancer in the same way the moon was conquered. No major scientific body, apart from the American Cancer Society, supports the proposal, and numerous organizations from the National Academy of Sciences downward have spoken out against it. Opening hearings on cancer legislation last month, Rogers displayed a 3-inch stack of letters he had received from scientists and scientific organizations protesting the bill passed by the Senate. The mobilization of scientific opinion came too late to influence the course of events in the Senate, and it may be too small to prevail in the House against the ill-assorted but powerful alliance backing the Senate-passed bill.

The first public surfacing of the proposal for a separate cancer agency was a report produced last November by the National Panel of Consultants on the Conquest of Cancer, a group appointed by the then chairman of the Senate health subcommittee, Ralph W. Yarborough (D–Tex.). Stimulus for setting up the panel came from the New York millionairess and philanthropist Mary Lasker, the surviving, fully active member of the remarkable quartet that orchestrated the growth of the NIH's budget from $2.5 million in 1945 to nearly $1.5 billion by the late 1960's. Her chief partners in this enterprise were the late Representative John E. Fogarty of Rhode Island and former Senator Lister Hill of Alabama, chairmen of the appropriations subcommittees in the House and Senate that deal with the NIH budget. The fourth member of the team was James Shannon, director of the NIH from 1955 until his retirement in 1968.

Although Mrs. Lasker and Shannon worked in concert to increase congressional appropriations for health research each year, they frequently disagreed over the direction of research, Mrs. Lasker and her allies tending to emphasize applied over basic research and the need to translate research results into methods of treating patients. In particular, as a member of the National Advisory Cancer Council, which reviews the grant programs of the National Cancer Institute (NCI), Mrs. Lasker used to argue for larger budgets for cancer research than Shannon thought could usefully be spent.

The report of the Senate Panel of Consultants represents a continuation of these arguments outside the forum of the NIH. The panel was cochaired by a long-time colleague of Mrs. Lasker, Sidney Farber of the Boston Children's Cancer Research Foundation, and Mrs. Lasker helped Senators Yarborough and Jacob J. Javits (R–N.Y.) pick the panel members. A former staff member of the Senate Labor and Public Welfare Committee has been quoted as saying that members were chosen on the basis of their national reputation in cancer research or philanthropy, since "this was a PR operation as much as anything." Although the scientific portion of the panel's report—by far its major component—won general praise, its chief recommendation, in favor of an independent cancer agency outside NIH, was to some extent blunted in impact by having been predicted. In asking the Senate for funds to set the panel up in March 1970, Senator Yarborough said the panel should direct particular attention "toward the creation of a new administrative agency which would guarantee that the conquest of cancer becomes a highly visible national goal."

The panel's recommendation was the basis of the Senate bill introduced in January this year and passed essentially unchanged in July. An important, maybe crucial, factor in the Laskerites' victory was the defeat of Senator Yarborough last year and his replacement as chairman of the health subcommittee by Senator Edward M. Kennedy (D–Mass.), regarded in the White House as a serious contender for next year's presidential election. The Administration at first firmly opposed the Kennedy-Lasker bill (known as S. 34). By way of countermeasure, President Nixon in his State of the Union message in January asked for an additional $100 million to be appropriated for the NCI (even though last year the Administration asked the Senate appropriations subcommittee to cut the NCI budget by $20 million). The President's science adviser, Edward E. David, urged in a speech in February that the cancer effort remain within the NIH, adducing the argument—since repeated by a train of scientific spokesmen—that it would be a mistake to isolate cancer research from the mainstream of the life sciences.

After these initiatives, the Administration rested its lance in the belief that the threat from the Kennedy bill had been headed off. Kennedy held 2 days of hearings in March, at which the members of the Senate panel and the American Cancer Society testified in favor of S. 34 and a preponderance of witnesses from the biomedical com-

Briefing

Two Cultures Note

The summer schedule of the director of the National Institute of Neurological Diseases and Stroke (NINDS) has drawn critical notice on Capitol Hill and has prompted a review of the use of government time and money by National Institutes of Health (NIH) scientists and administrators.

A wire service story last week related that, since he came to NINDS as director in 1968, Edward F. MacNichol, Jr., has spent 2 months each summer at Woods Hole, Massachusetts, and collected $25-a-day government per diem payments during the time he was there.

The issue was raised in an anonymous letter sent to, among others, NIH director Robert Q. Marston and Representative L. H. Fountain (D–N.C.), chairman of the House Government Operations Committee's subcommittee on intergovernmental relations and a frequent critic of NIH management. At Fountain's request, General Accounting Office (GAO) staff members assigned to NIH were asked to check relevant travel records.

GAO attention has apparently focused on the per diem payments, and MacNichol announced last Thursday that he had decided to place in escrow the total amount of the per diem payments pending review of the matter.

The incident occurs at an awkward moment for NIH since the question of whether the big new cancer research program will be administered by NIH or by a separate agency is under debate and should be settled before Congress adjourns (see story above).

MacNichol's own reactions are set forth in detail in a letter addressed "To My Unknown Critic" and made available by NIH. In the letter he points out that "for many years it has been customary for some intramural scientists and extramural grantees to come to Woods Hole for summer research. There is nothing illegal or immoral about this, and it has some important scientific advantages that the leadership of NIH has long felt far outweigh the extra cost." He notes that fresh experimental material of special use in his own work is available at Woods Hole, and that the concentration of American and foreign scientists at Woods Hole in the summer provides opportunities for collaboration and exchange of ideas.

MacNichol, who had spent five summers working at the Marine Biological Laboratory at Woods Hole before he assumed the NINDS directorship, says in the letter that his "participation in summer research was thoroughly discussed" with the then NIH director James A. Shannon and his staff at the time he was interviewed for the NINDS directorship. MacNichol writes, "They approved and indeed encouraged me to continue to do research and to continue to come to Woods Hole." MacNichols was a professor of biophysics at Johns Hopkins before joining NINDS.

Shannon, who retired in 1968, told Associated Press reporter G. C. Thelen, who wrote the original story, that he remembered no discussion of a Cape Cod office. Shannon said that "in general I do not think it advisable" for an institute director to administer his institute from a distance, but that he could "think of the right constellation of factors that would make it possible."

There is apparently no documentation of the arrangement in NIH files, and an exchange of correspondence between Shannon and current NIH director Marston is said to be aimed at clarifying the matter. Martson was out of Bethesda on institute business when this was written and was not available for comment. He has, however, defended MacNichol's work at Woods Hole as important to NIH. At the same time, Marston has said that he is reviewing "off-campus" work by the ten institute directors and other NIH officials. Sources at NIH say that Marston is expected to set up a committee to review standards that apply to travel

munity testified against it, including representatives of the Association of American Medical Colleges, the American Hospital Association, the Federation of American Societies for Experimental Biology, and the American Medical Association. In a letter to Kennedy, Philip Handler, president of the National Academy of Sciences, wrote that those responsible for the proposed National Cancer Authority "will find it necessary to reinvent virtually all of the National Institutes of Health within the Authority," if it is to succeed in its mission.

Until April, there were too few votes in the Senate health subcommittee to report the Kennedy-Lasker bill out, a situation that seems to have changed abruptly early in May. On May 11, the morning that the subcommittee was to meet in executive session to mark up the bill, the White House belatedly launched a second counteroffensive, with the unappealing name of Cancer-Cure Program (*Science*, 28 May 1971). A statement made by the President indicated a substantial shift which seemed to bring the Administration's position almost into line with the Kennedy proposal. But the Administration bill (S. 1828) that embodied the new position contained, among other features displeasing to the Lasker forces, a provision that the President could redelegate his authority for the proposed cancer agency back to the Secretary of Health, Education, and Welfare, which would leave everything much as before.

For reasons that are not wholly clear, the White House tacticians agreed to an abject compromise, which consisted of the substance of the Kennedy-Lasker bill (S. 34) topped with the number of the Administration's bill (S. 1828), plus a face-saving and otherwise unsupported phrase stipulating that the proposed cancer agency should be an independent agency "within the National Institutes of Health." The outlines of this compromise once agreed, two Senate aides set about fashioning a revised version of S. 1828 with the aid of a pair of scissors and a copy of S. 34.

This compromise, by which the Administration traded the integrity of the NIH in return for Kennedy's dropping his sponsorship of the bill, met the approval of all but one of the 80 senators who voted on the measure. The basic tenet of the Lasker strategy for a separate cancer agency—that Congressmen do not dare vote against more funds for cancer—seemed vindicated by the outcome of the Senate debate. But Senator Gaylord Nelson (D–Wis.), who cast the lone dissenting vote, believes he has not been harmed politically by his stand. "I haven't received any bad reac-

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and scientific work away from Bethesda by scientists and science administrators.

There seems to be no question about MacNichol's scientific standing. His special field is the neurophysiology of vision, and detached observers say he has done first-rate fundamental work in the biophysics of color vision. He came to NINDS as director apparently under the proviso that he would also direct his own lab at the institute. During the summers, two professionals who work in the Bethesda lab go to Woods Hole. MacNichol spends much of the summer catching up on the literature in his field, reviewing the past year's work with his research team, planning the coming year's research, and developing new research instruments in a workshop that he installed in the cottage he has owned in Woods Hole since 1968. As he sees it, he gets more work done away from the interruptions at NIH.

MacNichol's anonymous critic complained as well that NINDS director of intramural research, Henry G. Wagner, also spends two summer months at Woods Hole. In addition, the critic noted that MacNichol and two other NINDS officials had detoured on an Aegean cruise while MacNichol was en route to the Dalmatian coast to visit Kotor laboratory, which is partly supported by U.S. counterpart funds. In his own letter MacNichol replied that he and his colleagues had taken official leave during the cruise and had paid their own travel expenses.

Behind the criticism is the whole question of scientific tourism that involves university scientists as much as government scientists and administrators. On the principle that science knows neither national nor international boundaries, American scientists have built domestic and foreign travel into their life styles and grant applications. Scientists are not masochists, and scientific gatherings are seldom scheduled in disagreeable surroundings. MacNichol, for example, gave as a reason for accepting per diem during his summers at Woods Hole that "I lose money during the rest of the year attending meetings of professional groups which are usually held at expensive hotels." A remarkable number of international meetings are held in European capitals or in the ambiance of the Aegean, Adriatic, or Mediterranean.

Since World War II, federal science agencies have generally accepted the arguments for scientific cosmopolitanism although a cost benefit analysis would be difficult to make. The meetings range from exhaustive and exhausting work sessions to pleasant social gatherings in congenial surroundings. Side trips to interesting places are accepted as part of the life of successful scientists and their spouses. Other government officials, including those in the Congress, make the most of such opportunities, as do businessmen when they can, and scientists are probably at least as scrupulous as others about paying for the detours themselves.

On Capitol Hill, in the case of MacNichol, scientific tourism appears to be a secondary issue, and the question of the per diem payments are not the most bothersome aspect. One Hill aide familiar with the case said that he expects no technical violation will be found. He notes, however, that MacNichol has taken annual leave in addition to spending 2 months at the Cape in the summer, is an enthusiastic sailor who apparently sails regularly in season. The aide asks, "How can an agency do a vigorous job when it has a part-time director?"

A chronic problem for NIH lies in recruiting and retaining able scientists and science administrators when competing institutions, particularly medical schools, often can offer higher salaries and greater freedom. Ironically, NIH has contributed materially to creating these conditions. It is regarded as an advantage for NIH to have a man of MacNichol's scientific reputation in a top job. But MacNichol's explanation of how his work habits help him to do a more effective job is hard for NIH's patrons on Capitol Hill to understand and accept.—J.W.

tion, and the newspaper editorials in my state were in favor of my position," he told *Science*.

Nelson's opposition to the Kennedy-Lasker bill may have been aided by an old friend of his, Philip P. Cohen, professor of physiological chemistry at the University of Wisconsin. Cohen, who was a member of the National Advisory Cancer Council at the same time as Mrs. Lasker and Farber, seems to have been one of the first members of the scientific community to start lobbying against the Lasker proposals. In March 1971, he presented to Nelson's office a petition signed by more than 450 biomedical scientists in Wisconsin, including almost the entire faculty of the McArdle Laboratory for Cancer Research in Madison, protesting the establishment of a separate cancer agency. Nelson not only opposed the Kennedy bill in committee, producing an alternative bill that would have made the NIH as a whole independent, but also took his fight to the House in an appearance last month before the Rogers subcommittee.

Rogers, like Kennedy, has been chairman of his subcommittee only since January. Both are eager to establish their authority in health matters, a pursuit which has already led them into conflict on several issues, notably health manpower legislation. Rogers spoke out against the idea of an independent cancer agency as early as February. He opened his hearings on cancer by introducing on September 15 a bill designed to counter the Senate-passed bill in almost every particular. The chief thrust of the Rogers bill is to retain the National Cancer Institute within the NIH, but to transfer to the director of the NIH the czar-like powers designed by the Lasker group to be wielded by the director of an independent cancer authority. The Rogers bill raises the director of the NCI to the rank of associate director of the NIH (similar elevation is accorded to the directors of two other major institutes—the heart and lung, and the neurological diseases and stroke). Under the bill, the director of the NCI is allowed to prepare an independent budget, but the director of NIH can see and comment on it before it goes to the President. The director of NIH must also give his approval to any new peer-review system set up by the director of the NCI (in the Senate version of the bill, this approval is not required).

An important feature of the Rogers bill is a provision authorizing the directors of all NIH institutes to award grants of less than $20,000 without approval by their national advisory councils. This measure is designed to counter a principal criticism leveled by the Lasker forces against the NCI, and corroborated by a General Accounting Office study, that grant proposals are subject to average delays of up to 8 months.

Rogers and his aides claim that their bill embodies the three specific recommendations made by the Senate Panel of Consultants better than does the Senate bill. Thus the Rogers bill adopts the funding levels recommended by the Panel (a budget rising to $600 million by fiscal 1974—the Senate bill asks only for such funds as are necessary),

Soviet-American Conference

A group of Russian and American physical and social scientists gathered in Byurakan, in Soviet Armenia, last month to discuss a topic hitherto explored primarily by the writers of science fiction—the search for intelligent civilizations elsewhere in the universe.

The conference on Communication with Extraterrestrial Intelligence (CETI)*, the first of its kind, was jointly arranged by the National Academy of Sciences and the U.S.S.R.'s Academy of Sciences. The state of the art being rudimentary, only a vague set of recommendations emerged from the talks. In essence, the conference found that the arts of astronomy, biology, computer science, and radiophysics have progressed to the stage where they can be used to make "serious and detailed investigations" of electromagnetic activity in the starry deeps, and that such investigations are warranted because their fruits might influence the whole future of man. In a joint Russian-American statement, the conferees called for strengthening research in such areas as prebiological organic chemistry and searches for extrasolar planetary systems, as well as for new investigations to be directed toward uncovering modes of search for signals. A Russian-American working group, which will be expanded to become multinational, was formed to arrange more meetings and direct further study.

Two of the organizers of the conference, Carl Sagan and Frank Drake of Cornell University's Center for Radiophysics and Space Research, held a press conference in Washington last month to explain why the new explorations were justified.

They acknowledged that scientists have not, so far, run into any heavenly events that could plausibly be ascribed to other than natural sources. However, they pointed out, the planet Earth is still a technological parvenu. According to optimistic projections, the nearest intelligent civilization—assuming that one star in a million is hospitable to advanced forms of life—is likely to be at least several hundred light-years away. Since high-frequency radio, TV, and radar emissions, the only signs of Earth that are detectable from interstellar distances, began only about 50 years ago, our earliest signals are only 50 years out in space and can hardly yet be expected to have reached a receptive audience.

Sagan and Drake seemed to feel that there probably exist other civilizations whose technological sophistication would make earthlings look as though they had just crawled out of the primordial slime. They posed the seductive notion that there might already exist a sort of "interstellar communications club" which would be eager to grant us membership if we could only make known our presence.

Sagan had two basic arguments to support the idea that higher civilizations are around somewhere. First, he observed, man's view of his place in the universe has come a long way since the time Earth was thought to

* The acronym was designed to evoke Tau Ceti, the nearest sunlike star visible from the Northern Hemisphere, in the constellation Cetus. This is the first place scientists would look for other-worldly societies.

calls for the development of a cancer research program (the Senate bill does not mention a plan), and makes specific proposals for streamlining the administration of cancer research.

The Rogers bill was drawn up with advice from the Association of American Medical Colleges, and the president of the newly created Institute of Medicine of the National Academy of Sciences, John R. Hogness, was present at one drafting session with Rogers and AAMC president John A. D. Cooper. The fate of the Rogers bill depends on several factors, foremost of which is whether Rogers can retain a majority of his subcommittee in the face of blandishments from both the Administration, which is supporting the Senate-passed bill, and the skillful lobbyists associated with Mary Lasker. Several features in the Rogers bill seem designed as bargaining counters, but the failure of the Lasker lobbyists by last week to gain the compromise they had expected suggests that Rogers feels in a strong enough position with his subcommittee to drive a hard bargain.

In whatever form the bill leaves the subcommittee—and Rogers intends that his bill, not the Administration's, will be reported out—its next hurdle is in the full committee, the House Interstate Commerce Committee, chaired by Harley O. Staggers (D–W.Va.). Both sides are claiming Staggers' support, although Staggers has not indicated where his opinion lies (he sponsored the House version of the Administration's cancer bill but only as a courtesy). The Lasker forces claim that their pull with the Democratic members of the full committee, together with the Administration's pressure on the Republican members, will ensure a majority for the Senate-passed measure. Should the Rogers bill be reported out with the blessing of the full committee, it is almost certain to pass the House. Once in conference with the Senate, the House backers of a Rogers-type bill would be in a strong position, since in the event of deadlock authority over cancer research will stay where it is, under the control of the NIH.

The hearings held by Rogers' subcommittee, now in their fourth week, have produced some new faces, but few arguments that have not already surfaced at the Kennedy hearings. One reason, perhaps, is that the basic rationale for an independent cancer agency, that the NIH is incompetent to handle a major attack on cancer, has never been presented for serious argument. "There's a great myth about the omnipotence of the NIH, just as there used to be about the Pentagon, but in fact the place needs the same kind of going over as the Pentagon is getting from people like Proxmire," says one lobbyist associated with the Lasker cause. But the Lasker forces have not tried to prove this case except by assertion and, rightly or wrongly the bulk of the biomedical community seems to favor the contrary view, as expressed by Senator Nelson before the Rogers subcommittee, that the NIH is "a unique arrangement, probably the finest institution of its kind in the world, and certainly . . . the undisputed leader in the field of biomedical research."

—NICHOLAS WADE

Urges Search for Other Worlds

be the center of everything, and now that we know we are, in fact, in the "galactic boondocks," the obvious next step is to realize that life may not be unique to Earth. Second, he said, science has determined that amino acids, life's building blocks, can easily result from combinations of the simple chemicals and energy sources that already abound in space. And life can originate very fast, he added—Earth is 4.5 billion years old, and earliest fossils have been found to date back 3.4 billion years.

Of the two possible approaches—attempting communication with another civilization or eavesdropping on extraterrestrial radio activity—the latter was seen as preferable because of the huge time lags involved in transmission. Sagan and Drake think even the time problem might be overcome. We have not discovered anything that goes faster than the speed of light (except theoretical particles called tachyons, which can't be slowed down), but, they suggested, other civilizations might have discovered new laws of physics that could facilitate communication.

At the press conference, Sagan threw an interesting sidelight on the question of unidentified flying objects, a phenomenon that has baffled physical and social scientists since the end of World War II. "Flying saucers" could hardly be the vanguard of another world's interstellar problems, said Sagan, because they are uneconomical. Since all planets are round, and therefore finite, their resources are limited; creatures competing for the same resources must use them efficiently. Therefore, radio astronomy would universally be the most effective and cost-effective vehicle for cosmic explorations.

The U.S. government has spent virtually nothing on finding out about extraterrestrial intelligence, said the two scientists, except for a $20,000 grant from the National Science Foundation for travel expenses to the CETI conference and a $100,000 design study on a new, giant, multi-billion dollar receiver that is being funded by the National Aeronautics and Space Administration. This receiver would have a surface area of several square kilometers—which would make it ten times as big as the world's largest dish-shaped radio telescope in Arecibo, Puerto Rico.

Other countries advanced in radio astronomy, including the United Kingdom, Netherlands, and Australia, have shown little interest in the matter. The Soviets, though, have a modest program that involves a search for simultaneous extraterrestrial radiomagnetic events which are registered on a far-flung network of telescopes. They are also building a giant ring-shaped telescope one of whose duties will be to look for signs of intelligence from outer space.

Sagan admitted that the research projected by CETI was "in the context of large technology expenditures that don't have immediate value for the man in the street"—a proper effort would require the sort of financial outlays normally reserved for nuclear and space activities—but "there are few scientific endeavors which have the possibility of a greater payoff."—C.H.