lems by giving power over technical matters to a single department for scientific and technical activities of the government. These arrangements allow the President and the Bureau of the Budget to become knowledgeable of science questions without removing the technical activities from the agencies whose missions they augment.

Jerome Wiesner and his staff must be judged by what he and his office have accomplished rather than by the weight of reports so commonly used to evaluate professors. He helped the President to open a small path of understanding with the Soviets, encouraged the careful analysis of costs and effectiveness that permitted the Secretary of Defense to re-establish civil control over the military, strengthened the management of science within many of the agencies, and more recently helped make some small steps to connect better the scientific community to the problems of the less-developed nations. He unobtrusively insisted on a proper place for science in the affairs of the nation and gave continued support for free scientific inquiry.

As for me (one of the officers in the agencies whose scientific progress Wiesner is alleged to control), I have found him to be critical, helpful, and insistent that the decisions in the Department of Commerce were ours and not his, and that he served only to help the President and his secretariat. Like President Kennedy, he has insisted not only on the right, but the necessity, to talk to those who are informed and not only to those who, by some quirk of accident, occupy positions of authority.

All of us who have a part in the nation's scientific and technical affairs recognize that there are most serious problems facing the nation and its science and engineering. The technical resources of our country are now clearly limited. We cannot carry out all of the proposals that the scientists and technical people can make. Scientific and technological resources are a major basis for economic development and for national power, and we do not yet know how best to deploy them. The relative roles of private and public participation in the use of science and technology for practical purposes are not clear, nor do we know how to employ fully the fruits of science for the improvement of our society.

All of us seek to attract bright, intelligent, wise, and effective people into government service. Usually, scientists serving the nation full time find their careers interrupted and their pay far too low. Technical industrial leaders are frequently not considered because of concern for potential conflicts of interest. Academic people often are not fully prepared for the pragmatic problems faced by those involved in formulating scientific policy. Finally, many are unwilling to face the realities of American political life necessary to serving their government. There are others who would like to maintain their scientific, technical, industrial, or academic positions while influencing national policy. They would like the authority without the responsibility.

In these difficult times, this nation needs all of those who are willing to give of their time and effort to study, to understand, and to make science more fully serve humanity.

J. HERBERT HOLLOMON
U.S. Department of Commerce, Washington, D.C. 20230

Wiesner's Public Service

The editorial in the issue of 22 November [*Science* **142**, 1025 (1963)] suggests that when the President's science adviser retires from office, tradition requires that "comment at this time should consist of 'fulsome' praise of his policies and accomplishments." It seems to me that Wiesner's retirement does not call for either "fulsome" praise or "fulsome" criticism but for a dignified, judicious, reasonably sympathetic, and constructively critical appraisal of his tenure, one that will be worthy of the official journal of the AAAS. I hope that such a report may yet appear in the pages of *Science*.

My own opinion is that Wiesner deserves the gratitude and admiration of his fellow scientists for 3 years of devoted public service in their behalf while necessarily foregoing his own scientific work. As for his effectiveness in office, I can cite the obviously important part he played in helping to bring about the ban on atmospheric testing of nuclear weapons, which ranks as one of the most hopeful steps taken toward world peace since the end of World War II. I also recall two instances in which he used the full influence of his office to protect observational astronomy from possible permanent damage—from the orbiting of dipoles or "needles" in one instance, and in the other from the encroachment of man-made interference on radio-astronomy frequencies. In both cases Wiesner and his staff responded to the petitions of astronomers with sympathy and understanding, and he acted with great courage to safeguard the interests of our science. He and his associates on the PSAC are primarily responsible for the publicly announced policy of the United States government to forego space experiments that are harmful to science.

These few examples, and many others which are all matters of public record, in my judgment refute the assertion that "After almost 3 years in which Wiesner has participated in countless decisions, there is little in the public domain to indicate the quality of his judgments or actions."

I should think that communications like this one belong more properly in the Letters section than on the editorial page.

LEO GOLDBERG
Harvard College Observatory, Cambridge 38, Massachusetts

Science as a Tail to NASA's Kite

Rosa [*Science* **142**, 914 (1963)] is not the first to say, in effect, that we should support NASA research because of the scientific "fallout" accruing to other scientific disciplines. But if this accrual is so important, why not directly support research in "geophysics, . . . geomagnetics, . . . solar physics, astrophysics, and solar system astronomy"? Why waste money through a middleman? Rosa's inclusion of molecular biology among the beneficiaries of space research is particularly ludicrous; the question of spores in space is an interesting one, but hardly fundamental to molecular biology, and surely not to be included among any logical reasons for massive support of NASA.

His argument that "space has stimulated interest in science . . . more than any other scientific development in modern times" might be acceptable if we did not know the tremendous public-relations build-up given the whole enterprise; witness the successive astronaut launchings. The interest was built up by the glamor boys, and I dare say to the detriment of the rest of scientific endeavor.

Rosa reasons that "space offers mankind an opportunity to channel deep,

unconscious, irrational competitive drives into directions other than warfare." Our lack of knowledge of these "drives" is so great that if a tiny fraction of NASA money were put into psychological and social research, we would gain immeasurably more in preventing future war than from anything likely to come out of space.

Next he argues that " 'space science' . . . stimulates support for science in general. . . . The sheer size of the space effort has made 'unreasonably' expensive ventures 'reasonable.' " He advocates, in effect, that a scientist who wants more money for his own project should support the astronomical budget of NASA, for how could a government administrator turn down a request for a paltry $10 million for a telescope when NASA receives 500 times as much! Is this not intellectual dishonesty? Moreover, the argument works in reverse: as congressmen are becoming less enamored of NASA and cutting its funds, the rest of science is beginning to suffer. Moral: Let not science be the tail to NASA's kite. Let not scientists hack at the public till; let them rely on the worth of their projects to gain public support.

The use of space technology for scientific research has not reduced by one iota its use as a handmaiden to the military, and in my opinion the only scientific research arising out of space technology, out of NASA, is a byproduct of the military usages of the space program. Rosa's letter points up the need for a thoroughgoing review of our whole national scientific program. Our resources in men and money are not unlimited. Scientists themselves should have more of a voice than they have at present in the general direction of scientific research in this country. We scientists are allowing our talents to be propelled in directions not of our own choosing, or even of the national good, but those of the "industrial-military complex" of which Eisenhower spoke so feelingly.

PHILIP SIEKEVITZ

Rockefeller Institute,
New York, New York

Research Funds—Cost Accounting

In reading F. R. Fosberg's letter [*Science* **142**, 150 (11 Oct. 1963)] I was sympathetic with the implied thesis —research funds for research purposes only. Notwithstanding, I wonder how many scientists face up to the economics of research contracts and grants.

On a relative basis, the incremental indirect costs resulting from research may not be significant. For example, the cost of maintaining university libraries may be increased little if at all by the fact that research is carried on, even though research involves use of the libraries. Nevertheless, cost recoveries are governed not by marginal (or incremental) concepts but by so-called "absorption-costing" concepts. The latter permit cost recoveries to be based on proportion of use. Thus, 10 percent of the cost of maintaining libraries may be recovered through overhead if it can be established that research accounts for 10 percent of the use of libraries.

In many instances, indirect cost allowances in the aggregate must be material. Without them, I suspect that many universities would not be able to balance their annual budgets. In this respect, the very existence of some universities may be dependent upon indirect cost allowances. Thus, indirect cost allowances may be a significant factor in assuring that there will be a facility in which research can be conducted.

C. W. BASTABLE

Graduate School of Business,
Columbia University, New York

Motivational Research on Our Subscribers ($N = 1$)

According to my understanding, *Science* is intended to appeal to most people interested in science, laymen and savants alike. That this is not quite the case in actuality is rather obvious from the nature of the highly specialized reports (usually empirical results in biological studies). I myself, being closer to flying utensils than to hypophysectomized white rats, and only slightly interested in hypertension and neurotic behavior, started analyzing my ego recently in order to determine the reason for the accomplished fact of a renewed subscription. After about 2 days of reflection it dawned upon me that my narcissistic needs were at least partially supplied by the Letters section. If the editors continue to exercise, or, still better, even improve a little, their present judgment in selecting the very best morsels for publication, they might even succeed in overthrowing my pet hypothesis: the principal reason for the abysmal distance between scientists and humanists is found in the inability of the former to laugh at themselves.

ROBERT SCHMIDT

20166 Wakefield Avenue,
Detroit, Michigan

Scientists and Causes: Test Bans and Traffic Jams

I must disagree with the fatherly advice that D. S. Greenberg addresses to American scientists [*Science* **142**, 1635 (27 Dec. 1963)]: A test-ban treaty has been signed. Therefore we should "swing away from national preoccupation with international affairs" and give our attention to the "serious problems that afflict this country at home" such as "the hideous traffic problems that are wrecking American cities." He dispenses this advice while powerful and noisy hate groups beat the drums to dump the United Nations and scrap the test-ban treaty.

These same rabid advocates of "get tough" international policies are also opposed to sane solutions to domestic problems—civil rights, aid to education, Medicare (I am not informed on the Goldwater position on traffic problems).

Greenberg submits no evidence that Congress has either the will or the capacity to work for a world without war. His advice to scientists to abandon their efforts for disarmament and to stick to their scientific tasks only aids the militarists and the Goldwater politicians.

JOHN M. WEAVER

W. 520 16th Avenue,
Spokane, Washington 99203

Greenberg asks: "Where are the scientists going from here if they wish to continue to devote their after-hours energies to public problems?" He implies that they will go nowhere. He suggests that scientists could "rock any board of education with a well-drawn and well-publicized brief on the deficiencies of secondary education." It is my impression that few boards of education can be rocked by scientists or any other pressure group; it is likewise my impression that many scientists have contributed in many ways to attempts to improve secondary education.

This is not to disagree with Greenberg's thesis and some of his conclu-