in the direction of giving a closer scrutiny" implies that the goal is not yet reached. The point of diminishing returns, where the advantages of having funds available for medical research is outweighed by the time consumed in securing and administering them, may be close.

An aspect of the reports quoted by Congressman Fountain that has received inadequate recognition from scientists is the eloquent statements by the leaders of the National Institutes of Health in support of the liberal policies that they have been following. Clearly, NIH cannot support this point of view indefinitely against the desires of Congress, on whom they are, after all, dependent for funds. Scientists outside the government must also help in convincing Congress and the people that there are at least two sides to this question. The issue has come up initially with respect to support of the health sciences, but it may not stop there.

BRIAN MACMAHON
Department of Epidemiology,
School of Public Health,
Harvard University

Creativity and the Indigent Student

It is distressing to see . . . [you] give support to the archaic idea that a hungry student is a superior student [*Science* **139**, 79 (11 Jan. 1963)]. Some of the penetrating minds of the past and present may have been starved during their formative period, but to assign a cause and effect relationship is absurd. The same reasoning would suggest that we decrease by 50 percent the pay of all present scientists so that they will be twice as creative, thereby eliminating the need for a crash program.

Freed from financial pressure the "man of moderate endowment may show flashes of genius." Why dilute his academic struggles with monetary adversity?

WILTON H. BUNCH
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. . . Not all can be Enrico Fermi, but any reasonably competent Ph.D. can add to the sum of knowledge from which the Enrico Fermis draw. If recent Ph.D. theses are pedestrian, is it the fault of the Ph.D. candidate or of the professor and system under whom the work is done?

Furthermore, poverty at the graduate school level is not an automatic virtue. Probably lack of financial assistance has hindered more scholars, potential and actual, than reasonably adequate stipends could possibly do.

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. . . [the] report [of the President's Science Advisory Committee entitled "Meeting Manpower Needs in Science and Technology"] does not imply "that scientists, like nuts and bolts, are interchangeable and can be mass produced." It does imply that graduate schools will assert their traditional selectivity and accept only those students who are capable of quality academic performance; that science majors are not continuing their education because of financial difficulties; and that they can complete their programs earlier and do more creative work when devoting full time to educational pursuits than when working at odd jobs like cleaning pigeon cages.

The implementation of this document may not produce enough scientists—only because it doesn't start early enough! . . . To really increase the number of graduate students we must identify and encourage gifted youngsters in the secondary school—probably even more effectively in the elementary school. There are many studies to substantiate the fact that interest in science is "killed" or "kindled" early.

GLADYS S. KLEINMAN
Rutgers University,
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. . . I have noticed that a relationship exists between the amount of expensive laboratory equipment and the ingenuity with which problems are solved and techniques developed. A laboratory in the early stages of growth, and short of money for equipment, develops a high proportion of new information through improvisation. As the physical plant takes on more elaborate equipment, experimental design more often is set up around the instrumentation than around the problem to be solved.

HUGH H. HOTSON
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. . . The increasing formalization of our educational processes stifles that type of creative mind that might be

classed as "obsessed." Yet I know of nothing which has the motivating power of an obsession to solve a problem or prove a point. Although some educators are beginning to understand and value such unique students, it is too often the case that they are expelled from school, or are at least so frustrated and repressed by the necessity to conform to the established pattern that they grow into neurotic adults and are of little value to their fellow men. . . .

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Presentation of Papers

All scientists (and indeed nonscientists too) are aware that talks at professional meetings should be concise, lucid, and held to the allotted time. All are equally aware of how short we fall of this goal. Too often talks are rambling, confused, slow in getting underway, and then rushed and garbled as the speaker runs out of time. All this could be avoided if it were required that each speaker present the chairman of his session with a magnetic tape recording of his talk for playback over the hall's public address system. The author would sit on the platform, signal for slides at the right time, and be prepared to field questions at the end. He would have adjusted his talk to the proper length at home (or else the chairman could reject it) and he would have had to listen to it himself, the salutary effect of which would be incalculable.

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Missing Links in Computer Intelligence

The paper by Ulric Neisser on "The imitation of man by machine" [*Science* **139**, 193 (18 Jan. 1963)] describes three characteristics of human thought which are absent from machine programs. I would like to add a fourth characteristic which is, perhaps, the most important one. This is the property of "consciousness," the ability to be aware of the stimuli coming to us from our sense organs, and of the thoughts circulating in our own nerv-