Equal Opportunity

A tremendous amount of money has been and is currently being expended in an attempt to improve the scientific capabilities of American youth. Yet, do all youth receive an equal opportunity to benefit from this expenditure? Are these funds, many of which are derived from current taxes, actually being used to increase the subject-matter competency of future college science students within particular disciplines rather than to increase the scientific literacy of all youth as citizen-consumers? It would seem that a far greater number will become consumers rather than scientists.

During the past 10 years much has been said about the failure of elementary and secondary schools to provide adequate instruction in the sciences. Much has also been said to encourage these same schools to give students a better understanding of the relationships which exist between 20th century technology and modern social institutions. An ever-increasing emphasis seems to be placed upon the need for public and private elementary and secondary school teachers to acquire new factual information for dissemination to their students. However, it is extremely difficult to find publications concerning the degree to which the newly acquired information is communicated to and learned by high school students.

School administrators have been asked to indicate the necessary qualifications for secondary school science teachers. Is the science teacher unable to indicate the deficiencies which exist in his own subject-matter preparation? Further, to what degree does competent supervision exist in the public schools in general and, more specifically, within the sciences, when the administrator is likely to be less adequately prepared in them than the science teacher he supervises? This may be particularly true of smaller schools, but the debility appears to be general.

Is the college science teacher also shirking responsibility? Do those of us who work with science teachers in training attempt to determine the problems encountered by those working in the smaller schools? Do the present course-improvement programs involve a thorough analysis of the ways in which the discipline can be learned by high school students? Little evidence would indicate an affirmative answer.

While substantiating evidence is lacking, are institute participants selected on the basis of their previous college marks? Are some participants being selected because they teach in a particular community? It would seem that many people who are less well prepared academically, both in terms of marks and the number of science courses completed, should be the first to be invited to participate in an institute. Such teachers still remain in the classroom, while others have attended as many as 8 or more institutes.

In essence, while a large number of us welcome the opportunity to obtain grants, is there an abrogation of responsibility on our part? We apparently fail to investigate any values which may accrue from such expenditure in terms of an increase in the scientific literacy of high school students. If we are evaluating outcomes of institutes course-improvement programs, and the many other existing attempts to improve scientific literacy, then our failure to communicate and publicize our findings is also an abrogation of responsibility.

DAVID W. PIERSON
Division of Biological Sciences, Fort Hays Kansas State College, Hays

Critical Evaluation of Reviews

Margaret Mead has raised an important issue in her letter concerning "literary" versus "scientific" book reviews [*Science* **141**, 312 (26 July 1963)]. There is a vast difference between a literary work—which is evaluated by the reviewer on the basis of emotional impact, craftsmanship, persuasiveness, or even the reviewer's personal opinion of the author and what he may be trying to say—and a serious book on some scientific specialty that has become of interest to a literary review journal.

The critical evaluation of the work of one professional scientist by another is based on the assumption that both author and reviewer are engaged in a common enterprise: the search for scientific truth. This is not the situation between the author of a novel and its reviewer. Thus when the scientific work seems to contain erroneous logic, insufficient supporting evidence, or unjustified conclusions, the reviewer should point this out—and the author's reply should also be printed. Many times the critic aids the author by pinpointing weaknesses in logic (or even arithmetic) and science benefits.