Let us add some very practical dollars-and-cents considerations to the valid and urgent idealistic and philosophical thoughts Waterman expresses.

In the scientific realm we have been nurtured, directly or indirectly, by government money; thus, our technology has flourished. Overseas, in Europe and Japan, technology has also flourished, but largely without government money. The emphases of scientific developments are therefore quite different from those in the United States. While we have concentrated on frontiers in the macroscopic and microscopic worlds (space, microminiaturization), they have developed everyday commercial and industrial applications. Overseas science plays the traditional role of enriching life.

Because of this different emphasis, scientists can gain much from an exchange of ideas and products. With the projected decline of defense expenditures, we need to channel our efforts toward commercial-industrial applications. We can thus trade, exporting our advanced technology and obtaining in return practical applications. This diversification can be the solution to many of our future post-cold-war problems.

S. V. HART
Electronics Engineers International,
124 Lower Terrace,
San Francisco 14

College Boards for Biology

Fornoff says, "In chemistry and biology, studies made to date have not demonstrated the necessity for special [college boards] tests for the new curricula" (Letters, 25 Sept., p. 1385). He neglects to say that neither have these studies demonstrated the adequacy of a single test for students of the new curricula and students of the conventional curricula. Furthermore, he does not mention the effect that using a single College Entrance Examination Board test, combining conventional and new curricula approaches, will have on the teaching of biology. And so he misses a most crucial matter.

Through the courtesy of CEEB, two special committees of the Biological Sciences Curriculum Study had the opportunity to review two recent CEEB biology tests last spring. It was their unanimous opinion that those tests did not adequately reflect the kinds of learning BSCS students are intended to achieve and did not provide adequate opportunity for BSCS students to demonstrate what they have learned about biology and techniques of inquiry.

The study which Fornoff says is now being initiated to determine whether separate tests are needed appears to be too late to be of practical value. Such a study could have been worthwhile in 1961, but at this date the possibility of finding representative and uncontaminated samples is virtually nil. Publishers had sold 250,000 BSCS books to the schools by September 1963, and it is estimated that approximately 400,000 more were distributed by September 1964. Thus more than one-quarter of all biology students in the country will be using BSCS books. In addition, many teachers of conventional biology classes have attended BSCS-oriented institutes during the last two or three years; others have been studying BSCS materials informally. All of this suggests a potential "contamination" of conventional classes by BSCS topics and approaches to learning so serious (or so favorable, according to one's point of view) that "controls" for a dichotomous evaluation would be impossible to identify. On the other side of the coin, "contamination" of BSCS courses by topics taken from conventional courses is practically guaranteed, as teachers have realized that their students must prepare for a CEEB examination that focuses on conventional biology.

The effect of a single omnibus test on the teaching of biology constitutes a problem of major proportions. As every teacher knows, teaching is strongly influenced by testing procedures; the more critical the use of the test scores, the more influence the test has on the curriculum. As teachers and students come to realize that tests will cover both conventional and BSCS biology, most teachers will try to teach (and most students will try to master) such an amalgam. Thus, the biological ideas and themes which are fundamental to each of the versions of BSCS biology will necessarily become distorted and diluted. Officials of CEEB and the Educational Testing Service have frequently stated that they do not wish their exams to dictate curricula. Yet such a composite test would do precisely this. Such a test would penalize both BSCS and conventional courses in favor of a composite course —to match the composite test—thereby adversely influencing the major aims of conventional biology and the major aims of BSCS biology.

That BSCS and conventional biology students learn different skills and concepts was amply demonstrated in 1961–62 in a testing program designed by ETS (*Science*, 17 Jan., p. 265). Replication in 1962–63, when BSCS teachers had become more accustomed to the new curricula, demonstrated differences that were double those found earlier. It seems wasteful to delay action on the creation of two appropriate tests while conducting further statistical studies which can hardly throw new light on the subject. The position being maintained by CEEB will surely result in discouraging advancement in biological education.

ARNOLD B. GROBMAN
Biological Sciences Curriculum Study,
Boulder, Colorado

Prestige in the Two Cultures

There may be a significant connection between the separation of "the two cultures" on campuses—which Lafore (21 Aug., p. 790) describes in his witty and clever extension of C. P. Snow's thesis—and the subject of Abelson's editorial in the same issue (p. 771).

Citing a recent survey of public opinion, Abelson reports that, in the eyes of the public, "scientists" have more prestige than "professors" and much more than the creative art professions. There may be some reason to suspect that professors (including those professors who are scientists) hold opinions similar to those of the general public regarding occupational prestige; Beardslee and O'Dowd in *The American College* (N. Sanford, Ed., Wiley, New York, 1962) have shown that faculty and undergraduates are in agreement with respect to the perceived images of selected professional occupations.

At the present time, as regards prestige, scientists are the "haves" or "have-mores" and the traditionalists the "have-nots" or "have-lesses." Distance on a generalized prestige scale may be an important component in what keeps the "two cultures" apart. As in other social contexts, the "haves" and the "have-nots" tend to avoid each other's company.

LEROY A. STONE
Mental Health Research Institute,
Fort Steilacoom, Washington