Letters

Economic Recovery and Scientific Research

I believe that we biomedical scientists should join together in an attempt to convince the Administration that stronger support of health-related scientific research (see News and Comment, 23 Oct., p. 420) is synonymous with governmental efforts aimed at economic recovery.

Funded grants provide jobs for faculty and technical staff. They provide funds for purchase of supplies and equipment. The purchase of equipment catalyzes the development of new scientific instrumentation, which is often exported. Overhead provides additional salaries for accounting and administrative staff.

The awarding of grants is done by peer review on the basis of merit and perceived relevance to health or scientific knowledge. The product of research—new basic or applied knowledge—ultimately leads to improved health care, which in turn may lead to increased productivity.

Research and purchases of instruments, for example, are intimately connected. The number of spectrophotometers purchased by the biomedical research community depends on approval by study sections. In my experience, these are frequently excised from the grant request, not because they are unjustified, but rather because the more equipment is purchased, the less funds are available for funding the salary and supply categories of other research grants. Thus, increasing the budgetary allocation for research will increase the purchase (or lease) of scientific instrumentation.

Support of scientific research creates jobs which produce goods of immediate or future value. Expenditure of government funds in these areas makes more sense than attempting to create temporary positions with limited government resources for individuals who cannot obtain positions on the basis of merit in a competitive world.

ALAN F. HOFMANN
Division of Gastroenterology, Department of Medicine, School of Medicine, University of California, San Diego 92103

The Language Problem

Jean-Claude Pecker's complaint (Letters, 16 Oct., p. 254) of linguistic parochialism (or more correctly, linguistic imperialism) in astronomy is founded on truth, but errors of logic, statistics, and fact appear to mitigate his point. As an astronomer who is widely known as a Francophile on both sides of the Atlantic, I believe his letter will only make matters worse.

It is indeed true that facility in other languages is diminishing to disastrous levels among American scientists. This is not due to active discouragement, as Pecker suggests, but rather to a lack of active encouragement and to a general abandonment of language requirements for advanced degrees here. The continual linguistic exposure endemic to Europe does not exist in the United States, simply due to a homogeneity over distances that most Europeans do not comprehend. It is also true that many, probably most, Americans have a perfect arrogance towards non-Anglophones; sometimes the level of jargon and slang at international meetings is so high that even I have difficulty understanding my fellow countrymen.

But Pecker challenges us on grounds that are testable. First, he applies a Citation Index "impact factor" to three publications. One is American, one English, and one "European," published in both English and non-English editions. The American publication is an annual volume intended to provide lengthy state-of-the-art reviews of a complete subject, while the other two are monthly journals in which each article is only a small fragment of a subject. One would expect the review volume to be referenced more often than the others. The conclusion that this shows "American scientists quote only themselves" does not logically follow from the given data.

Nor does Pecker analyze the data statistically. The impact factor in this case is basically meaningless, and what is needed is some hard tabulation of references by and to Anglophone writers. When one starts to do this, one finds that no scientific publication in the free world is restricted to one nationality or one language group. For example, the U.S. publication *Annual Review of Astronomy and Astrophysics* (*ARAA*) has shown the following distribution of authors over the past 4 years: United States only, 67 percent; Anglophone only, 73 percent; non-Anglophone only, 17 percent; and mixed, 9 percent. The average volume contains 16.5 articles, with authors from five countries.

The non-Anglophone journal most often referenced in ARAA appears on cursory examination to be *Astronomy and Astrophysics* (*A & A*), which has Pecker's number 3 impact factor. How does it stack up? A volume selected at random (vol. 83, 1980) shows the following lineup of authors: United States only, 7 percent; Anglophone only, 17 percent; non-Anglophone, 75 percent; and mixed, 8 percent. That is, the percentage of Anglophone authors in the European journal is the same as the percentage of non-Anglophone authors in *ARAA*. Unsurprisingly, there are 13 countries represented in this volume of *A & A*. An examination of the references is an eye-opener, however. In ten papers selected from the European journal, 75 percent are to Anglophone publications, most of them American. These are not Americans quoting themselves. Finally, two recent articles selected from *ARAA* show the following distribution of references: English-language books and journals, 86 percent; others, 14 percent.

The careful reader will quickly ask, "On what basis were the sampled articles chosen?" My criterion was simple: they all had French authors. The two French authors in *ARAA* cited their own work numerous times; 86 percent were in English-language journals.

The numbers cited are only to be taken as approximates, since I used some arbitrary ground rules, some of which had no likely effect, others of which reduced the English percentages. For example, I used the laboratory to define the language group of an author. Most symposium proceedings were excluded as ambiguous, since they are nearly always published in English. The journals published in the Netherlands by Reidel were counted as English, since the sponsoring impetus has usually come from over here. The hard fact, though, is that the single most cited journal in all groups was the *Astrophysical Journal*. Other ground rules would give different figures, but the qualitative conclusions would not be changed much.

According to International Astronomical Union (IAU) figures, Anglophone astronomers outnumber the French by six to one. Nearly half of the world's astronomers live and work in English-