Letters

Clinician-Scientists

James L. Parmentier (Letters, 2 Mar., p. 878), in his comment on the attempt to increase the number of physician-investigators, draws the conclusion that this is based on a misunderstanding of career objectives and does a disservice to Ph.D. research personnel because the proponents of the program "seem to assume that basic scientists. . . cannot understand disease processes or coordinate clinical problems with experimental results." This conclusion is erroneous; those advocating the program almost universally accept fully the major contribution of Ph.D.'s to clinical research. The steadily increasing number of nonphysician scientists supported by the National Institutes of Health is concordant with this.

The advance of medical research needs both clinician and nonclinician scientists. The reason why physician-scientists are one (but only one) of the essential components of the mix of medical researchers is that there must be a group of scientists who have the skills and interests that make it possible for them to recognize among the experiments of nature through disease those which reveal the operation of principles that are unknown and have never been the subject of deliberate laboratory investigation. Since such events are uncommon and occur randomly, the astute, trained clinician with broad scientific scholarship who is constantly on the lookout for the rare but important natural experiment is in the best position to benefit from these occurrences. The history of advances in medical research amply reveals the truth of this.

Parmentier asserts that physician-scientists engaged in clinical activities will not by definition have as much time for experimentation, thinking, or scholarship as the nonphysician-scientist. This is not correct. There are superb creative clinicians in many departments, including my own, who spend well over half their time in laboratory research. Furthermore, availability of time alone does not make a successful researcher. As has been documented in the past, a small minority of all Ph.D.'s produce 85 percent of the research carried out by this group. Time is no substitute for passion, intelligence, and scientific imagination. The existence of many clinician-scientists who stand in the very first rank of fundamental research is a clear empirical disproof of this argument.

Every effort should be expended to avoid professional chauvinism. Medical research will suffer if we fail to ensure an adequate supply of clinically directed research by both clinicians and nonclinicians. The current decline in physician-scientists is a sad phenomenon, and both clinicians and nonclinicians should join in the effort to reverse the trend.

NORMAN GESCHWIND
Department of Neurology,
Harvard Medical School,
Boston, Massachusetts 02215

Extrasensory Perception

Christopher H. Dodge maintains (Letters, 3 Feb., p. 440) that "psi in various forms has been around for a long time and has already been applied for practical (and not-so-practical) purposes in a number of areas." Vernon R. Padgett and Steven Cody ask (Letters, 9 Mar., p. 1014), In what form and where?

Although psi devotees continually make this claim, it has never been clearly demonstrated that extrasensory perception has any practical applications nor has it been clearly demonstrated to exist in the laboratory. There is no conclusive evidence that dowsers can locate oil or water or that psychics can help detectives locate missing persons, help investors achieve success in the financial markets, or effectively contribute to the arms race.

Much has been made of late of remote viewing, telekinesis, and the Ganzfeld experiments, but the alleged results are still inconclusive. Parapsychologists talk of an impending breakthrough, but being on the "verge" of something is not equivalent to having demonstrated its practicality or reality. That is why so many scientists still remain skeptical about the entire area.

PAUL KURTZ
Committee for the Scientific Investigation of Claims of the Paranormal, Box 229, Central Park Station, Buffalo, New York 14215

The Diels-Alder Reaction

Thomas H. Maugh II's chronicle of theoretical contention "Can multibond reactions be synchronous?" (Research News, 16 Mar., p. 1162) classifies me as a disputant ("Goldstein, however, says . . . ."). May I offer a clarification and introduce a note of historical perspective?

Seltzer was the first to demonstrate that experimental "secondary" deuterium isotope effects can be used to evaluate the symmetry of a Diels-Alder transition state (*1*); Thayer and I used "primary" carbon and oxygen isotope effects to the same end (*2*). We judged our transition state to be highly unsymmetrical, whereas Seltzer judged his to be highly symmetrical, principally because the two Diels-Alder reactions were different. The two conclusions are therefore mutually compatible; neither one has seriously been questioned.

The still earlier paper by Woodward and Katz (*3*) provided the intellectual framework for both these investigations and many others. That report of an unexpected experimental discovery was the first to define and distinguish the "two-step" and "two-stage" descriptions of the Diels-Alder reaction, a recurrent theme of computational commentary ever since. Perhaps this achievement of the late R. B. Woodward has too easily been forgotten in light of his subsequent more powerful generalizations, but one wishes it were not so.

M. J. GOLDSTEIN
Department of Chemistry,
Cornell University,
Ithaca, New York 14853

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Soviet Studies

Constance Holden, in "A comeback for Soviet studies" (News and Comment, 24 Feb., p. 795), writes that "Language training is a fundamental problem" in Soviet studies. What she and others have written about the "comeback" does not make me very optimistic about the future of Soviet studies in this country. It takes more than politics or political science to create an understanding of a country. I have argued fruitlessly with my fellow Sovietologists that social science material about the Soviet Union should be accessible in English to the

general public as well as to students and academics. I doubt that our relations with the Soviet Union will change much until every citizen of the United States is as comfortable with the thought of another social system and another ideology as he or she would be with a neighbor who speaks a different language. One way to achieve the necessary familiarity would be to institute an ongoing translation program. To my knowledge, no such program exists. I hope those responsible for the administration of the new money coming into Soviet studies will think seriously about such a program.

ETHEL DUNN
Highgate Road Social Science Research Station, Inc., 32 Highgate Road, Berkeley, California 94707

Geostationary Satellites

In his otherwise excellent article on the upcoming negotiations concerning the geostationary arc (News and Comment, 9 Mar., p. 1043), John Walsh glosses over an important point. Crowding among communications satellites in the arc results from a failure to price that increasingly scarce resource, in much the same way that water, energy, or other resources are overused when underpriced. This failure also blunts the incentive for the communications industry to develop both the new satellite technologies Walsh mentions and terrestrial microwave, cable, and fiber-optic networks.

What is needed to elicit technological innovation and the right mix of terrestrial and space communications modes is an auction or other price-oriented scheme. Recent research (*1*) suggests that firms would be willing to pay as much as $500 million per year in such an auction for the right to "park" a single satellite in that prime portion of the arc with a view of the entire United States. Such an auction would also relieve the Federal Communications Commission (FCC) of the mind-boggling responsibility of ranking applicants for arc space on the basis of increasingly diverse—and nebulous—characteristics. It would also put to a market test one important criterion the FCC weighs—the financial viability of applicants.

Another advantage of a market-like allocation concerns the international complications Walsh describes. Regardless of the initial allocation of "parking spaces" to countries, resale or leasing of these slots is attractive. Since the life of a communications satellite is only about 7 years, less-developed countries (LDC's) could participate in markets as lessors of spaces as they develop the technology to put their own satellites in orbit. Once developed (with the help of arc rental income), the LDC's could use the arc themselves when it was time to renew the lease—unless, of course, they found it to their advantage to continue to act as an "arclord."

The problem for U.S. representatives at the upcoming ORB 85 conference is that notions of markets to allocate global natural resources tend to be ill received in international forums. However, a successful U.S. experience with an arc market implemented between now and the 1985 ORB conference can demonstrate the potential benefits of a worldwide market. Will there be room in the arc? Certainly, if this resource is treated as the valuable commodity it is.

MOLLY K. MACAULEY
PAUL R. PORTNEY
Resources for the Future, 1755 Massachusetts Avenue, NW, Washington, D.C. 20036

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The Endocrine System

Dorothy T. Krieger's article (2 Dec., p. 975), and especially her figure 2 (on p. 979), leave the reader with the impression that sponges possess neurons and that only vertebrates possess endocrine glands. Although sponges are capable of limited behavioral integration, the presence of neurons has never been demonstrated in this primitive group (*1*). As for endocrine glands, comparative physiologists and endocrinologists consider that some invertebrate groups (especially among the arthropods) do possess them, although their and Krieger's definition of an endocrine gland may differ.

MICHEL ANCTIL
Département de sciences biologiques, Université de Montréal, Case postale 628, Succursale "A," Montréal, Québec, H3C 317 Canada

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The figure referred to by Anctil was reproduced from an article by D. Le Roith, J. Shiloach, and J. Roth (*1*). After discussion, these authors have revised the figure and included Anctil's suggestions. In the present version (below) it is made more clear that sponges, the simplest of the Metazoa, lack neurons, whereas hydra, at the next level of multicellular complexity, are representative of the simplest organisms that have neurons. The heading over fungi and yeast has been revised. With regard to endocrine glands, the classic definition is one in which products of such glands are secreted to act on target organs and are not based on the consideration of the neuroendocrine glands that are present in invertebrates. The figure has been revised to make such a distinction clear.

DOROTHY T. KRIEGER
Division of Endocrinology, Department of Medicine, Mount Sinai Medical Center, New York 10029

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