

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.

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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 suc-

cessful 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.

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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.

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1. P. A. V. Anderson, *Progr. Neurobiol.* 15, 161 (1980); I. D. Lawn, in *Electrical Conduction and Behaviour in 'Simple' Invertebrates*, G. A. B. Shelton, Ed. (Oxford Univ. Press, New York, 1982), pp. 49–72.

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.

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Higher plants	Other unicellular organisms	Unicellular invertebrate animals	Multicellular invertebrate animals	Vertebrates
Alfalfa	Fungi Yeast	Protozoa Amoeba	Slime molds Sponges Hydra Worms Molluscs Flies	
				Endocrine glands of vertebrates: islets, thyroid pituitary et al.
				Neurons
Hormonal peptides and related messenger molecules				
Chemical neurotransmitter molecules				