

DIRECTOR OF SCIENTIFIC AFFAIRS

National trade association located in Washington, D.C., needs Ph.D. well grounded in biological sciences (Toxicology) with strong background in chemistry and 3 to 5 years experience. Candidate should have an interest in dealing with Federal agencies at scientific levels and be capable of analyzing legislative-technical impact. High level of oral and written communications skills required, with some experience in professional journal editing desirable. Ability to work in a volunteer structure necessary. This position provides opportunity to interact on a technical-scientific level with all facets of the chemical industry. Reply in confidence to:

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long fuel doubling time (although different breeder concepts differ radically in this respect). But we look toward a relatively low-energy-growth civilization in the period beyond A.D. 2000. Anent our use of the unit Q for 10^{15} Btu, we could have helped history by using the symbol q, now becoming common for what we meant.

Szego's comment on energy from biomass deserves special attention. Many have suggested it; we enthuse about it, for countries that (1) are amply blessed with warmth, rain, and sunshine; (2) are less energy-intensive than the U.S.; and (3) have a labor surplus and an energy deficit. Thus we think of biomass energy as more appropriate to some regions of Latin America, Africa, and South Asia. This could be intermediate technology at its best. But for the U.S. at present? Food requires approximately the same basic conditions, and a competition between growing things to burn and growing things to eat must be resolved in favor of the latter, chiefly because we are the world's prime food producers. Of course, local exceptions exist (forest products scrap in Maine,

Georgia, and the Pacific Northwest), but on the whole, biomass for the U.S. leaves us at present underwhelmed.

Scientific labor force

To the Editors:

In Philip Handler's views of "The American University Today" (*Am. Sci.* 64:254-57, May 1976), I find the most forthright expression I have encountered crediting graduate students and postdoctoral fellows as the labor force by which the fundamental research enterprise has primarily progressed and indicating that there is a surfeit of scientists as a consequence.

This dilemma, as Dr. Handler points out, has not been squarely addressed. Indeed, little is heard of manpower problems in the pages of *American Scientist*. As Sigma Xi promotes research, I believe it behooves the Society to consider the plight of the surfeit of scientists that wishes to continue in research endeavors.

Orville G. Lowe
Los Angeles, CA

Discovery of America

To the Editors:

For the discovery of America, Richard S. MacNeish ("Early Man in the New World," *Am. Sci.* 64:316-17, May 1976) hypothesizes a human migration across the Bering Strait some $70,000 \pm 30,000$ years ago. He reviews several dozen archaeological sites supposedly older than the starting date in my model for a late and explosive invasion of humans, based on large mammal extinctions, of 12,000 years ago.

To the best of my knowledge none of the older sites MacNeish lists had been independently validated by skeptical investigators. The few sites of allegedly great antiquity that have been reexamined by experts have not won endorsement (Martin, 1974, in *Arctic and Alpine Environments*, ed. Ives and Barry, Methuen).

To prehistorians I offer a paradox followed by a paradigm. The more new sites of great age (over 12,000 years) that are claimed but not replicated, the more likely it becomes that none is valid. The moment when mastodons, mammoths, and ground sloths depart from the American stage is the moment when Paleolithic players first enter.

Paul S. Martin
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World population growth

To the Editors:

In "Population vs. Environment: A Crisis of Too Many People," by James R. Echols (*Am. Sci.* 64:165-73, March 1976), my work was for the most part properly referred to and employed. With respect to one important conclusion, however, this was not the case; the cited quotation is accurate, but it is taken out of context. It appears at the end of the section discussing the nature of world population growth that would be required to satisfy a slowdown called for by the 1973 Meadows's *Limits to Growth* study. In my book it is clear that it is the conclusion of the Meadows's team and not my own "that profound changes in several fundamental facets of economic and social life, including fertility behavior, are essential in order to avoid a collapse of the world system."

Tomas Frejka
The Population Council, New York