

letters

the Soviet government in respect to such noted scientists as Aleksander Lerner, Benjamin Levich, and Andrei Sakharov. I am, therefore, sending all of the information requested by Nadgorny regarding special computer-simulation techniques to Aleksander Lerner, a noted cyberneticist and computer scientist. I informed Nadgorny that he could obtain these documents by contacting Lerner, a fellow Muscovite.

I feel that this may be an important method by which scientists and engineers in the western world can make it clear to their counterparts in the USSR that repression of Soviet Jewish scientists and, indeed, of many Soviet civil-rights activists such as Sakharov and Solzhenitsyn is counter to any East-West detente, be it political, cultural, or scientific. I urge others to follow my example in this matter of transmitting reprints and other information to the USSR.

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Solar sea power impact

I wish to comment on the Environmental Impact section in the article "Solar Sea Power" by Clarence Zener (January, page 48).

Zener mentions increased convection currents dissipating heat outside the tropics. Consideration must be given to changes in vertical water velocity in the site area due to the thickening of the 7 deg C layer of water and seasonal fluctuations of the temperature profile. The 5 deg C water, which usually has a higher dissolved oxygen content than 7 deg C water,¹ is raised approximately 400 meters before being released at the 7 deg C level (see figure 2 of Zener's article). James Rust (letter, September, page 9) quotes a flow rate of 5.6×10^{10} pounds per hour, which is roughly 2.4×10^5 cubic feet per second for sea water. Assuming a 100-square-mile area of impact and total vertical compensation, the resultant downward velocity is 0.86×10^{-4} feet per second (2.62×10^{-3} centimeters per second). H. Stommel and A. B. Arons² quote 4×10^{-5} centimeters per second as the maximum upward velocity at 1000 meters. To just balance this velocity would require an impact area of 6550 square miles; thus the area of influence of the sea power plant will not be small. Location of many of the sea-power sites will be near the continental shelves as a matter of economics, and the impact area may extend into the biologically productive shelf waters.

My assumptions are conservative, but they suggest that the environment

impact of the redistribution of dissolved oxygen, nutrients, isotherms and corrosion products needs thorough investigation because oceanic fauna are much more sensitive than are estuarine fauna. The total number of environmentally suitable sites may not allow sea power to generate the total energy needed in the year 2000 as discussed by Zener, but sea power certainly can contribute a significant portion.

References

1. L. R. A. Cappurro, J. L. Reid. "Contributions on the Physical Oceanography of the Gulf of Mexico," chapter 1 in *Winter Circulation Patterns and Property Distributions*, Worth D. Nowlin, Jr, Gulf Publishing Co, Houston (1972).
2. H. Stommel, A. B. Arons. "On the abyssal circulation of the world ocean, II. An idealized model of the circulation pattern and amplitude in oceanic basins," *Deep-Sea Research*, 8, 2 (1960).

DAVID F. PASKAUSKY
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I found Clarence Zener's article "Solar Sea Power" and the letters it generated very interesting. But, I question Zener's comment (June, page 13) that "Because of ecological reasons, the cold efflux of the condenser should not mix with the warm layers above the thermocline."

Most tropical oceans are relatively barren because phytoplankton, the base of the food pyramid, needs both nutrients and sunlight. The warm surface waters have light but few nutrients. The cold deep waters have the nutrients but not the light. In those few places where nature has arranged an "upwelling" and mixing of the layers, fish thrive. Off the west coast of Peru, we have an example of this. There, a tiny fraction of the sea provides over 20% of all the fish caught on earth.

Would it be feasible to build Zener-type power plants that would deliberately create upwellings in tropical seas, then make use of both the electric power (as hydrogen) and the increased fish (as a food source)?

Reference

1. C. P. Idyll, "The Anchovy Crisis," *Scientific American*, June 1973.

JAMES E. BLAIR
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THE AUTHOR RESPONDS: David Paskausky has raised the very important consideration of the redistribution of oxygen content of the oceans by a widespread use of solar sea power. If solar sea power does indeed become economically competitive with nuclear and

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with fossil-fuel power, it will become widespread, and will inevitably cause a redistribution of oxygen as well as of mineral nutrients and of temperature. Such a redistribution has the potential of benefits as well as of harm. In order that the plant sites and plant design be chosen to maximize the overall potential benefits, it is necessary that much more be known about the dynamics of the ocean ecology and ocean currents, and it is desirable that plans be made to take advantage of these potential benefits.

CLARENCE ZENER
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Bull market in physics?

I feel compelled, as an industrial physicist for 20 years, to reply to the recent editorial concerning more physicists in industry in the October issue. The motivation for this article seems to be one more symptom of the melancholia syndrome now gripping this country—give me the good old (50%) days. Such a point of view partially ignores the historic fact that physics was far oversold to the business community in the 1950's era. Armed with notable successes during and immediately following World War II, physics became a glamour issue to the business investor; buy a few physicists and they will invent you into a fortune. Like any glamour issue, speculation increased demand, and the physicists had their heyday, but also like a glamour issue, interest fades when the return on the investment does not justify the cost.

I do not wish to discount the successes physicists have had in the preceding 20 years. These successes however, are now recognized and established in the mind of the business community. The return on an investment in physics is now a predictable quantity from its 20-year performance history. The value in use of a physicist must also be recognized by the academic community. They must cease overissuing stock (reduce the output of physicists) lest the issue becomes so worthless that physicists will suffer even further job loss and overall quality of performance will decrease.

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Finding a job

It is enlightening to read the letter by David Bowen on the procedure for finding a job in physics (July, page 9). As a Postdoctoral Fellow who has un-

successfully sought a permanent position for the last five years, I think I am entitled to make a few remarks on this subject.

1. Bowen has failed to mention one most important ingredient in a successful job search. Conversations with successful applicants reveal a pattern that shows the importance of internal connection with an influential friend in the department concerned. A good word put through by such a friend is worth more than all those careful preparations recommended by Bowen. As a corollary many of the vacancies have already been filled before the advertisement appears in placement services. It is true that no one has been caught in these illegal advertisements. However, many of us underemployed or unemployed physicists have experienced this unfair practice. It is either the difficulty of collecting evidence or unwillingness to pursue the matter further that perpetuates this practice of nepotism in hiring not only in physics but in other fields as well.

2. As Bowen readily admits, his method of job-hunting is at the expense of teaching, research and personal commitments and it takes about two or more years to complete. Casting aside all the moral implications, I suspect if his method is followed literally it could involve one in a vicious circle that would eventually reflect a lower teaching and research qualification in the resume one is so eager to upgrade.

3. It is mentioned that the letter of application or *curriculum vitae* must contain something that will stand out and catch someone's eye. This trick has been known for some time, and I understand that some applicants would go to the extreme of quoting their achievement out of context or faking their qualification to suit the requirement. This practice not only does injustice to the honest applicants but also breeds a corruptive character in physicists who used to be considered highly idealistic in comparison to other more earthy professionals.

4. His procedure applies only to each individual physicist; therefore, the success of one must be at the expense of the others. In other words, Bowen's method is not capable of solving the massive unemployment of physicists. This unemployment problem was created when the US and Canadian governments abruptly terminated their generous funding to research institutions and universities. The difficulty of finding employment for many physicists could have been avoided if the termination was more gradual and a national policy was established to control the production of graduates in physics. This mistake on the part of the governments and institutions has been unfairly passed onto the physi-

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