the earth has a circumference of only 40,000 kilometers and the earth-moon distance is on the order of hundreds of thousands of kilometers, I assume lunar winds are the upwelling agents referred to. This new earth-moon interaction is indeed an exciting discovery!

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The text should have read "hundreds *to* thousands of kilometers away."

—BEVERLY KARPLUS HARTLINE

"Retreading" Ph.D.'s

Like the weather, personnel shortages in engineering are discussed universally. I wish to discuss a short-term alleviation of the problem that we have demonstrated (locally) but which, I believe, has important national implications.

Since the minimum time it takes to create B.S.-Ph.D. manpower in engineering by means of the traditional high school stimulus, increased B.S. facilities, and Ph.D. programs requiring additional research support, is on the order of 5 to 10 years, one must look elsewhere. There is in this country a substantial pool of persons trained in theoretical physics, the more theoretical regimes of chemistry, and many subdisciplines of the biosciences. This set is at least underemployed. Our experience in our own interdisciplinary laboratory has been that, in 2 years, persons trained in any of the above named disciplines can become active teacher-researchers in fields of engineering and applied science.

I envisage a program funded by the U.S. government (or any combination of government and industry) to provide "retraineeships" for U.S. citizens (or any selected group) with at least a M.S. or Ph.D. in the above disciplines. A simple administrative mechanism is available:

University laboratories (departments and institutes in the relevant fields with the manpower deficiency) would be permitted to locate any suitable candidates whom they can put to work in an active research program. (Evidence must be provided about the quality and size of the research effort.) Such candidates will have two responsibilities: conduct research in the defined areas and either take or teach a couple of courses per year. These traineeships should be paid at the going local rate for nontenure postdoctoral positions or junior faculty. No overhead, supplies, and so forth should be involved, thus making it possible to pay the individual directly if necessary. This total immersion in an active research group in applied sciences or engineering "retreads" Ph.D.'s (and M.S.'s) so that they can become useful in new disciplines in 2 years. I cannot think of any other process that can come close. This kind of process also does not generate or continue the feast-or-famine syndrome in engineering schools. The retrained individuals could also contribute some new frames of reference to departments in industry or universities.

An increase of say $10 million to, say, the National Science Foundation Science Education Directorate could get such a program started immediately.

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The "Monster" Proof

Recently, Robert L. Griess, Jr., announced, in a private communication, that he could prove the existence of a certain finite simple group—the "monster" F_1 with order

$$2^{46} \cdot 3^{20} \cdot 5^9 \cdot 7^6 \cdot 11^2 \cdot 13^3 \cdot 17 \cdot 19 \cdot 23 \cdot 29 \cdot 31 \cdot 41 \cdot 47 \cdot 59 \cdot 71$$

Science reporter Gina Bari Kolata, in a provocative article (News and Comment, 25 Apr., p. 377), upbraids Griess for not having given her and another science reporter details or descriptions of his work over the telephone.

Griess presented a lecture on his construction of F_1 at the Institute of Advanced Study on 5 May, and at the group therapy seminar at the University of Chicago on 6 May. His penetrating and powerful conceptual methods will be eagerly studied.

There is a great difference between private communication between scientists reporting their activities and published reports in regular channels. In view of the great complexity of his work, we think Griess was quite justified in not discussing it with a reporter.

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Erratum: In the report by K. L. Webb and C. F. D'Elia (29 Feb., p. 983), the title should read "Nutrient and oxygen redistribution during a spring neap tidal cycle in a temperate estuary."