into remaining warm milk. Now cover crockery bowl with dry dish towel; then put on crockery bowl cover; and finally completely wrap bowl in two heavy Turkish towels. Store in warm place for at least 7 hours (or overnight). Remove towels and cover. Blot up any liquid that has formed on top of yogurt. Spoon out three heaping tablespoons and place in glass (not metal) jar, storing in refrigerator until needed as starter for the next batch. Add salt to remaining yogurt and store in glass jar in refrigerator. If you prefer a sharper tang, the leavening time should be lengthened. [From W. Atiyeh, *Scheherazade Cooks!* (Channel, Manhasset, N.Y., 1960)].

Anyone who hasn't tried yogurt and cucumber salad made with fresh yogurt hasn't lived. Slice cucumbers into a bowl with crushed garlic, salt, some crumbled dried mint, pepper, and yogurt.

EVALYN F. SEGAL
*Institute for Child and Family Development, University of North Carolina, Greensboro 27412*

## Value of Historical Perspective

Lieberman (Letters, 17 Apr.) commented that "the university is not a highway department"—it cannot be expected to solve society's operational problems. Fine (Letters, 5 June) considered Lieberman's letter to illustrate "the very essence of what makes the university nonrelevant to the student," and added "Suffice to say that in the age in which we are now living, *all* of our intellectual resources must be brought to bear on social problems" (italics his).

I suggest, in turn, that Fine's letter illustrates a major failure of our educational system—the failure to instill a sense of historical perspective. Most earlier generations faced social problems of a magnitude similar to ours. It may be too much to suggest that if they had devoted all of their intellectual resources to immediate social problems we would still be living short uncomfortable lives in smoky caves, but there can be little doubt that most of our children would still die before reaching maturity, and that it would be impossible to produce enough food for the present population of the earth. We would also lack all of the physical conveniences of modern life, as well as our literary, musical, and artistic inheritance. It is certainly desirable that the earth's population should share more equally in these physical conveniences and in the ability to appreciate and enjoy this intellectual heritage, and university people should be as involved as other good citizens in trying to further desirable social change. But we should remember that exclusive concern on the part of our ancestors for their contemporary problems would have left us with neither conveniences nor intellectual heritage to share. By the same token, we would fail in our duty to humanity were we to focus exclusively on the immediate social concerns of our own time.

There are short-range relevancies and long-range relevancies. A most important part of man's evolutionary legacy is the ability to value knowledge for its own sake. We have learned from experience, though, that knowledge, however irrelevant it may seem when new, often becomes socially valuable with the passage of time. The university, like other organizations and individuals, can undertake to serve the short-range needs or desires of society in any number of ways, from advising the military to mounting antiwar campaigns. Some direct university attention to immediate problems is desirable. But the things that the university does best it does almost uniquely, and these serve the long-range needs of society. A university of the type that Fine seems to advocate might make some short-range contributions to the solution of specific problems, but it would be a traitor to its long-range social and human responsibilities, as well as to its own tradition. It would no longer be a university. A society that devoted all of its attention and resources to contemporary problems would have no need for universities. Such a society would not deserve a long future and most likely would not have one.

DANIEL E. ATKINSON
*Department of Chemistry, University of California, Los Angeles 90024*

## Global Energy Balance

Mankind consumes energy resources and releases heat to the environment. The release occurs primarily at land masses. The average rate of releases can be compared with the radiation balance of the earth's surface. Previously, I cited the value 1 : 2500 for the ratio of these quantities (Letters, 19 Dec. 1969), after MacDonald (*1*). Since the exact meaning of this ratio was not clear to Hammond (Letters, 13 Mar.) who compared the heat energy released by man to the rate at which the atmosphere rejects heat to space, I wish to offer additional discussion to clear the misunderstanding.

Radiation balance at the earth's surface refers to the difference ". . . between the absorption of solar radiation at the surface and the net radiative emission from the surface" (*2*). One estimate for this quantity is 68 watt/$m^2$ of earth surface (*3*). The average energy released by man is about 0.02 kcal/$cm^2$ in 1 year (*4*) or about $4 \times 10^9$ kilowatts, which converts to $2.7 \times 10^2$ watt/$m^2$ of land area. The ratio of these two quantities is 1:2500.

Man is capable of perturbing the earth energy balance through modification of the atmosphere, the land and water surfaces, and by injection of heat energy. The quantity of energy called the radiation balance of the earth's surface primarily goes into heating air, evaporating water, and driving meteorological processes. The heat energy which man releases adds to, and perturbs, the radiation balance. Those natural processes which drive energy from the radiation balance at the surface will be modified by man's injection of heat energy into the environment.

Were our understanding of global energy balance sufficiently developed, we could determine the limits within which the effects of heat energy perturbations will remain local and near the surface, rather than cause changes which will propagate to other parts of the system and affect the atmosphere and world climate, and the atmosphere-space energy exchange. We are not there, however, and I view Hammond's suggested example (world population of $20 \times 10^9$, with per capita heat production rate of 20 kilowatts, which implies a rate of adding heat energy of more than 1/20 the radiation balance at the surface) with some alarm.

DAVID A. BERKOWITZ
*Mitre Corporation, Bedford, Massachusetts 01730*

### References

1. G. J. F. MacDonald, *Tech. Rev.* **72**, 27 (1969).
2. P. A. Sheppard, in *Encyclopaedia Britannica* (Benton, Chicago, 1969), vol. 15, p. 282.
3. G. J. F. MacDonald, in *Power Generation and Environmental Change*, D. A. Berkowitz and A. M. Squires, Eds. (M.I.T. Press, Cambridge, Mass., in press).
4. M. I. Budyko, *Modern Problems of Climatology* (Hydromet. Publishing House, Leningrad, 1966).