LETTERS

Metrication: Historical Perspective

The tone of A. Hunter Dupree's letter, "Metrication as cultural adaptation" (19 July, p. 208), is exemplary, but regrettably his arguments are not. Like the English, who "could have profited from our . . . experience when they came to decimalize their coinage," Dupree does not appear to benefit from history.

If we consider that the greater part of the world uses the metric system, there is surely no shortage of examples of how countries with varying social and technological characters originally managed their "cultural adaptations." Investigation reveals that the general concern was not to look back to preserve a marginal and relatively unimportant aspect of heritage, but to effect a practical reform for future generations in a world where intercommunication was increasing. But perhaps after all it is this looking backward that makes our case unique: carpenters in France are presumably able to repair buildings somewhat older than those in Providence, Rhode Island, without calling for a return to the toise.

To write that wholesale metrication involves "destroying one culture and substituting another" is to give an exaggerated importance to quantitative measurement in the cultural life of a nation. Whether it was the Romans giving the British a metric system two millenia ago, or the French giving it to the world in the last century, no cultural dark ages appear to have followed the rapid withering of old measuring systems. No doubt some mourned the passing of miles and leagues, as today some mourn the passing of the steam locomotive. But we don't need to be the first country genuinely at home using both diesel and steam locomotives.

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Dupree speaks of making "the United States . . . at home using two or more measuring languages." He seems to be overlooking the fact that we are at present using four systems of measurement: metric, engineer's, machinist's, and English (and a fifth if you include horse racing). All of this is patently ridiculous; engineers measure in tenths of a foot while machinists measure in tenths of an inch, with no common ground anywhere.

Dupree's point about carpenters working on old buildings is also badly taken. Lumber sizes in use today are not the same as those used 200 years ago, so it does not matter in the least whether old construction members are measured in cubits, inches, or centimeters when being replaced or repaired.

Speaking of carpenters, it might be nice to have a bit of honesty brought into our lumber sizing. Why should a piece of lumber measuring 1⅝ by 3⅝ inches be called a two-by-four? Calling it a four fifteen-by-nine twenty-five (its actual size in centimeters) would be honest and descriptively straightforward.

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Cancer Research in the Wrong Direction?

Bandwagons have always existed and there will always be those who jump onto one. Sometimes it is creative and useful to do so, but usually it involves a sacrifice of original ideas. To survive in research, unfortunately, people are forced to do such things.

Cancer research has become a booming business for some groups in the past few years because the people and the government want a cure for cancer. Tissue culture has emerged as a respected science of tremendous importance. But business and industry have crept in there too. In addition to culture dishes and media, animal cells have become a commercial product. One can buy cells by the kilogram from a supplier. This is certainly an advantage, and since cancer researchers have started using commercial cells, mostly of two kinds (3T3 and WI38), considerable amounts of information have been accumulated about the biology of these cells.

What have we found and what does it mean? We have learned that viruses and chemicals can transform 3T3 cells to a neoplastic state and that these cells can produce tumors when inoculated in suitable hosts. But the tumors produced by these cells are sarcomas (derived from fibroblasts), which are very rare in human beings; 90 percent of human tumors are carcinomas, which are derived from epithelial cells. So what do we gain from growing sarcoma-producing cells in tissue culture except publishing papers and doing research to

stay in research? Epithelial cells and fibroblasts have little in common except that they are both animal cells; they are derived from two embryonic sources with different functions, and the tumors they produce are also different. Also, 3T3 is a cell line associated with abnormal chromosomal conditions, which makes it even less desirable for cancer research.

Why can't people at least try to reproduce the disease that is occurring in the human body? Conversely, if they want to cure a disease occurring in the human body, they must be able to create an analogous condition in tissue culture. So, why can't carcinomas be induced in tissue culture? The simple reason is that it is very difficult to obtain and culture pure epithelial cells. They can not be manufactured commercially. The investigator has to spend time and energy to generate epithelial cells. This problem has been recognized by all tissue culture scientists. On the contrary, cells like 3T3 grow wild in bottles and are available in plenty. This is simply closing one's eyes to a challenging problem and doing something that is not useful in terms of the long-range goal of curing cancer.

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International Agricultural Education

We agree with Albert V. Baez (Editorial, 26 Apr., p. 417) that the effectiveness of foreign assistance can be enhanced by transferring the art of teaching science to the scientifically trained foreign graduate students returning to their homelands from U.S. institutions. We at Prairie View, with the assistance of a grant from the Agency for International Development, are committed to the premise that agricultural technology can be accepted and utilized by the grassroot farmers of developing countries through appropriate educational methodology taught to young scientists. We are presently developing a proposal for researching a delivery system for the transfer of agricultural technology to the rural poor. One phase of this system includes the education and training of our graduate students, who, in addition to their technical courses, are required to pursue a minimum of 9 credits in education of the 36 required for a master's degree in soil sciences.

Some foreign students will continue their education at other institutions. They may not have the opportunity or inclination to continue their studies in education. However, during their training at Prairie View, they are encouraged to develop instructional modules which include autotutorial lessons, workbooks, visual and audio aids, and evaluation criteria specifically designed (in terms of language, customs, and relevant problems) for use in their country. The student is also encouraged to consider our institution as a link for the exchange of information during his professional career.

Many of our staff have served in technical assistance programs and are aware of the special skills and personal attributes needed to successfully transfer knowledge (considering the different mores and environments) in developing countries. This experience is utilized in modifying courses to meet the needs of our foreign students.

Baez's proposal has our full endorsement, and we suggest that AAAS members at each university involved in international work meet annually to exchange ideas regarding the preparation of foreign students as teachers of science in their homelands.

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Wisdom Shortage

Comparisons are invidious. The truth of this is admirably illustrated by Philip Abelson's editorial "Media coverage of substantive issues" (31 May, p. 941). Relieved of its self-congratulatory, rather narcissistic praise for *Science* and its strictures against less exalted media, the editorial makes a number of good points. Both their import and their importance are lost, however, in the irritation engendered when one learns that *Science* is "designed to inform rather than to excite," that *Science* "can [if it wishes] produce a more rounded, complete, balanced, and scholarly story" than, presumably, the daily press.

Science should show a decent reluctance to claim a monopoly on wisdom, if for no other reason than that it is in critically short supply.

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