Letters

Waste Management

Philip H. Abelson's editorial on waste management (7 June, p. 1145) contained some important perspectives on the perceived magnitude of the problem, various funding mechanisms for remedial action, and adequacies of existing technologies. Having served on a previous Office of Technology Assessment committee (*1*), I offer the following observations.

There have been, and perhaps always will be, disputes about what is a "solid waste" and which "solid wastes" are "hazardous wastes" (*2*). Strictly speaking, the term "toxic waste" is a misnomer that should be expunged from use. Everything can exert a toxic effect at a toxic concentration on some susceptible species. A solid waste is not "hazardous waste," however, unless an effect is combined with an exposure.

There is also a perfusion of "numbers" in the hazardous waste management game (*3*). These can be numbers of generators or sites, quantities of waste (wet or dry), or groups of waste managers, contractors, or politicians active at any given time. One must use numbers with care, however, since remedial actions vary in extremes, that is, from routine monitoring to complete transfer of contents to another site. Costs will vary according to complexity.

The introduction of a waste-end tax to complement other sources of revenue should be encouraged. While a front-end tax on chemical feedstock is perceived to be simple to administer, the quantities of raw materials used bear no relation to the quantities of wastes generated. In fact, a front-end tax is regressive and penalizes those who apply environmentally preferable alternatives—for example, recovery of materials and energies from partially processed materials before wastes are generated and waste treatment to reduce volumes and hazards of wastes after they are generated. Existing technologies are generally adequate for hazardous waste management if they are properly applied and appropriately monitored. New and innovative technologies may have applications, but they will not immediately replace existing technologies.

I disagree with Abelson's point that, "The major environmental toxic wastes are halogenated organic chemicals." There are a number of entrenched misconceptions that these chemicals as a generic class are all synthetic in origin, equally toxic, environmentally persistent, and hard to burn. A growing body of literature shows to the contrary that some are of natural origin; range in toxicities by many orders of magnitude; are degradable by biological, chemical, or photochemical processes; and are not particularly difficult to incinerate. They are blessed (or cursed) with being relatively easy to detect at low concentrations in environmental samples. Without establishment of *de minimus* levels of concern, however, any concentrations greater than zero are pronounced hazardous.

I subscribe wholeheartedly to the philosophy of minimizing, but not of eliminating, landfills. By promoting recovery and treatment first, the need for landfills is ideally reduced to only the essential disposal of noncombustible and relatively nontoxic residues (*4*). Costs of these preferable alternatives are higher, but the trade-off of immediate waste reduction rather than perpetual care is worth the price.

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References

1. *Technologies and Management Strategies for Hazardous Waste Control* (Office of Technology Assessment, Washington, D.C., 1983).
2. S. L. Daniels, *Environ. Prog.* **1** (No. 4), N2 (November 1982).
3. ———, *ibid.* **3** (No. 4), N2 (November 1984).
4. ———, paper presented at the AAAS Annual Meeting, Los Angeles, Calif., 28 May 1985.

Princeton's Intellectual Trust

Natural history collections are fundamental educational and research resources. Their importance stems from the fact that collections of geological or biological materials represent a scholarly, historic, and even esthetic asset built up over decades, and often over generations. Natural history collections have value in every sense comparable to that of collections of books or of works of art and as such are traditionally treasured by scholars.

Universities can buy faculty and facilities, but few universities today could afford the enormous investment of manpower, time, and money necessary to establish, de novo, a natural history collection for the purposes of research and advanced instruction. When an institution of Princeton's standing gives away valuable paleontological collections, prizes that have been amassed over more than a century's time, the reaction reported by Constance Holden (News and Comment, 5 Apr., p. 38) is understandably strongly negative. We believe that Princeton's irrevocable loss of a unique asset represents an even more ominous development: the divestiture of intellectual opportunity.

Financial limitations force every university to balance competing demands for space and faculty appointments. Princeton, however, has employed this academic truism as an excuse to abandon the major scientific field at the interface between geology and biology. With 15 full-time geology faculty and 20 research and technical support staff at Princeton, the claim of insufficient resources rings hollow. The fact is that Princeton has chosen to pursue geology from a narrow, more technical base.

Geology is part the study of history, part the study of physical and biological processes. Without paleontology, geology is robbed of its historical and biological dimensions. In giving away its paleontological collections, Princeton has clearly failed to honor a major scientific trust.

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