

SW-87

solid waste management

CLOSING THE CIRCLE

by Samuel Hale, Jr.

IN THE TWO YEARS that I have been with the U.S. Environmental Protection Agency (EPA), and particularly since joining the Federal solid waste management program, I have observed that there is a breach that is just beginning to heal between people such as you, who have been working for a long time, with very little public enthusiasm or support, to improve the environment, and those who discovered the issue in the spring of 1970 when the first Earth Day celebration occurred.

It was a shock, I am sure, to hear from freshly-enlightened environmental spokesmen that no one had been doing anything about the environmental crisis before they discovered it. While most of the pioneers in the environmental movement have welcomed the fact that

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their long-ignored cause finally surfaced and became the cause of millions, some, rankled perhaps by the sudden shift in public expectations, countered by accusing their critics of exaggerating the problems.

But the profound, worldwide reexamination of environmental issues which has occurred in the past two years should by now have moved all of us to realize the seriousness and complexity of the environmental crisis of which solid waste is a part. We have all learned that we cannot go on using the finite resources of this planet as if they were infinite—and that we can no longer deal with environmental problems as if they were simple, isolated problems, susceptible to solution outside the broad social, political, and economic framework of which they are a part.

Solid waste management is a root environmental issue and illustrates, perhaps more clearly than any other environmental problem, that we must change many of our traditional attitudes and habits. We must work to adapt our institutions, both public and private, to the problems and opportunities of solid waste, of resource recovery, and of misuse of our national resources.

The broad front on which we fight the solid waste battle today is a fluid one, and we can hardly make a move without being beset by a cacophonous roar of claims and counterclaims about precisely what we should do and shouldn't do to win it.

It seems to be a characteristic of our society that as soon as a problem has been discovered, we feel it should be solved at once in a simple and

expedient way; if this fails, to despair of its being solvable at all. This is no doubt part of what has been termed our frontier mentality, and it is due, in part at least, to this mentality that when the first wave of public awareness of the environmental crisis hit our country, we hadn't even begun to take the first small steps toward *proper disposal* of the ever-growing solid waste of our high-production, high-consumption society. A thoroughly urbanized people, we had gone on acting as if all we had to do was to throw away our ugly discards, whatever their nature, into a pile somewhere—preferably, out of our immediate sight.

The frontier solution to the urban solid waste problem was the open dump—aesthetically offensive, contributing to rodent and insect problems, wasteful of land, contributing often to air and water pollution, and with nothing to recommend it except that it was cheap, quick, and dirty. We were proud to regard ours as the most sophisticated society in the world when it came to exploiting raw resources, processing them, manufacturing them into goods, and transporting and distributing them with great efficiency. But we had given almost no thought at all to closing the city dump, when suddenly we were told that the ecological circle had to be closed throughout the world—that cheap, quick-and-dirty intrusions into the environment had to cease—unless man were to perish.

As a result of this realization, the field of solid waste management, like other environmental fields, has been

in ferment in the past few years.
Signs of this can be seen everywhere:

- Thousands of neighborhood recycling centers and redemption depots have sprung up throughout the country, as citizens and industry alike responded with commendable zeal to the realization that resource recovery is a basic ecological issue.
- In some communities, the war on waste has centered on convenience packaging and the nonreturnable beverage container as the principal villains.
- Environmentalists increasingly decry the wastefulness of burning or burying our once-used resources and call on localities to do something to recover "urban ore".
- There has been a vocal demand that we apply space-age technology to the solid waste problem, with the suggestion that the techniques that got us to the moon can lift us out of the dump.

Many members of the solid waste management establishment, overwhelmed by their own collection and disposal problems, have been quick to say that these signs of interest and change do not really help us solve the solid waste problem. The recycling centers, they point out, salvage an insignificant fraction of the solid waste load. Adequate markets for secondary materials simply don't exist, affluent Americans will throw away deposit bottles if the nonreturnables are banned, and, while we place our faith in instant technological solutions, presently-available technological, institutional and management solutions seldom get

beyond the planning stage.

The fact is, however, that the incomplete picture just drawn is of a public anxious to help solve a problem. It seems to me that those of us concerned with this field, whether from business or from government, must settle down and clarify for the people what the real options are in solid waste management—what the real obstacles are, and where the real opportunities lie for managing this problem in a sane and sensible way. Like many other problems, hidden within it are the seeds of opportunity.

It is for this reason, then, that I would like to explore what I see as some of the most important of those issues with you today.

environmental quality

The most pressing issue in the solid waste field, it seems to me, and perhaps the most basic, centers around the environmental aspects of traditional solid waste collection and disposal. Few would argue that substantial improvement is needed in this area—and that it is needed in the very near future.

According to our 1968 National Survey of Community Solid Waste Practices, only 6 percent of the Nation's land disposal sites met accepted minimum requirements for a sanitary landfill. Some 14,000 communities relied on open dumps, a majority of which were, by design or by accident, openly burning. Some 70 percent of the country's municipal incinerators were judged to have inadequate air or water pollution controls—even in 1968 when standards were substantially more

lenient than they are today. No more than a handful of the municipal incinerators currently in place meet EPA's existing Air Quality New Source Performance Standards. In coastal communities, problems centered not so much around open dumps or air-polluting incinerators, as around ocean dumping. Our evidence indicates that such communities have annually barged close to 50 million tons of solid wastes and sludges out to sea, and seldom in treated form.

For a number of reasons, the picture in 1972 is not quite as bleak as it was in 1968.

- Stiffer air pollution laws have virtually eliminated most open burning of municipal and related wastes—often, interestingly enough, with the unexpected additional benefit of spurring a community or groups of communities to completely reconsider and reformulate not only their disposal practices, but also the structures and institutions through which they handle their waste collection and disposal. The most familiar example of such benefits to those of you here is, of course, the actions of Minneapolis and the formation of MRI by the private sector. Other examples of much needed organizational change induced by strengthened air pollution laws can be found elsewhere however. Particularly noteworthy is the trend toward the use of regional sanitary landfills that can be observed across the country.
- Active enforcement of water pollution laws is also beginning to play a role

in improving the environmental aspects of solid waste disposal, but in a more limited way than air pollution actions. We know, for example, of seven large open dumps that have been closed under EPA's Harbors and Refuse Act—and existing evidence would indicate that this trend will increase in areas where dumps are located adjacent to rivers and waterways.

- After years of neglect, States are beginning to give attention to the environmental aspects of solid waste management. Many States have passed and are in the process of implementing laudatory programs to license land disposal sites and to ensure that applicable air and water pollution standards and zoning and other restrictions are met. New incinerators cannot be constructed unless they comply with EPA's new, and very tight, national air emission standards.
- My own office is developing, and will soon be issuing, guidelines that establish standards that must be adhered to by all Federal agencies in the operation of their own land disposal sites and incinerators.

In spite of this recent progress—much of which, it should be noted, has been the serendipitous byproduct of actions aimed, not at solid waste, but at air and water pollution—we still today rely primarily on that appalling ecological anachronism, known as the open dump as our principal method for disposing of our nation's discards. We must move more quickly to abandon this seemingly inexpensive but environ-

mentally costly method of disposal. Progress toward this end will not, in my view, depend primarily on the development of new technological solutions or on sporadic actions by environmental or other groups but rather on the birth of a genuine public commitment—expressed through government at all levels—to environmental values which will not condone cheap, quick and dirty disposal practices.

Towards this end, we are placing renewed emphasis on Mission 5000 as a nucleus of other citizen involvement and support activities which are already underway. As you know, Mission 5000 was begun almost two years ago as a cooperative effort on the part of all levels of government and many service and civic organizations, as a grass roots effort to support the closing of dumps in favor of more environmentally acceptable means of disposal.

Thus far, about 2,000 dumps have been closed. We plan to support this activity, in cooperation with States and local governments, and the public, until our original goal of 5,000 dump closings has been reached. We believe the public is beginning to understand that there is no real conflict between the immediate need to improve our disposal practices and the fact that we must simultaneously move as quickly as we can toward the day when a much lower percentage of our wastes will need to be disposed.

As public understanding increases we can be sure that the institutions which serve the public will be called on to insure that all solid waste activities are conducted in

environmentally acceptable ways. Our obsolete disposal practices are bound to be a clear and early target. Consequently, in EPA we fully intend to examine in depth the issue of stronger regulation of disposal practices prior to the time next year when the Resource Recovery Act of 1970 expires and new legislation will be written. In our view, the adverse environmental effects of improper disposal are so great and the need to retain proper land disposal as a viable option, along with resource recovery, is so clear that there may be very compelling arguments for the Federal government or the States to assure effective regulation of solid waste disposal.

*efficiency and effectiveness
of solid waste systems*

Closely related to the question of environmental regulation of solid waste management systems is the question of the efficiency and effectiveness of those systems. As increasingly strict environmental requirements are placed on solid waste practices, we can expect to hear claims about the costs of those requirements and the inability of individuals, cities or corporations to pay the costs. In large part, costs are a function of the efficiency and effectiveness of systems providing solid waste services. Meeting necessary environmental standards in solid waste may be very expensive if we rely upon inefficient institutions to manage our wastes. It may be, however, that meeting such requirements could cost little more than we are currently spending—and perhaps

less in some areas if we take steps to ensure that solid wastes are handled in the most efficient, effective manner possible.

In addressing this issue I am fully aware of its diverse and varied aspects, including the level and quality of service and the availability of service to all in a given community, systems productivities, optimum size and scale of individual systems, the public-private interface, and so forth. Let me start from some basic contentions which by now are a part of the "conventional wisdom" in the solid waste management field.

First, for many reasons which tend to vary from locality to locality, most local solid waste management systems are not as efficient today as they could or should be. Most systems could make significant improvements in efficiency and productivity with relatively simple changes—by rerouting trucks, for example, or by rationalizing areas served by private contractors to prevent costly overlap, or by using different collection vehicles with different manpower inputs. We have seen the impact of such system modification in work we have done with Cleveland and Huntington Woods, Michigan, in reducing overall collection costs in both cities by more than 20 percent—and we are confident that it is possible elsewhere.

Second, there are many examples of systems that are "good" when viewed in terms of environmental quality, efficiency, and quality of service. This is hardly news to the private sector, since many of the examples which come readily to mind

are private systems. In fact, many of the normal characteristics of the best private systems—the discipline of user charges as an incentive to efficiency, the use of systems analysis and management information systems techniques to manage collection operations, the use of excellent sanitary landfill operations coupled with very creative approaches to subsequent land development, and so forth—are the very components which we would argue are necessary to operate a model or optimum system, whether public or private.

Third, having an environmentally sound solid waste management system need not break a community financially. Our evidence indicates that the per unit (family, person, etc.) cost of systems that maintain high environmental standards is not excessive when related to current expenditures, except perhaps in the cities in the Northeast which may have to implement long-haul arrangements to disposal sites. While we would not claim that communities would spend less in the process of upgrading their systems environmentally, we do think that the increased costs will be quite small, particularly if communities take steps to emulate efficient systems that currently exist around the country. Keep in mind that disposal, which is the cost element that must increase as we upgrade environmental standards, currently represents less than a quarter of total community solid waste management costs. Increases there can be largely offset by savings in the other part of the cost (the three quarters that is spent

for collection) where substantial savings generally are possible.

Finally, it is our contention that solid waste management systems, if they are to be effective, need, in most cases, more efficient and stable sources of financing for both capital investment and operations. In our view, solid waste management systems should be based on user charges for individuals, commercial enterprises, and so forth. These charges should cover and equitably distribute the full costs of operating environmentally sound solid waste systems in a manner analogous to the provision of what are generally thought of as public utility services—electricity, gas, water or the telephone. In fact, the overall analogy of solid waste services to these services is one which should be carefully explored by every community.

There are admitted problems with the user-charge approach, including administrative costs, difficulties of determining rates for different types and levels of service, and the regressivity of such charges against the poor. As evidenced in many localities already, however, these problems can be minimized through such steps as combining solid waste billing procedures with water or electric bills, varying the levels of charges to charge the poor less than the non-poor, and so forth. Compared with these problems, the benefits of the user charge are overwhelming. They eliminate an existing drain on general revenue sources traditionally used to finance solid waste services; they establish a basis for front-end financing opportunities different from

normal municipal sources, thereby increasing local flexibility; and most important, they introduce, by their very nature, strong incentives for efficiency in local solid waste management systems.

Many issues are readily apparent in these remarks about the efficiency and effectiveness of solid waste systems. Most apparent, perhaps, is the fact that the costs of more stringent environmental standards and the growing realization that the private sector provides a far larger share of residential and commercial solid waste management services than was heretofore thought, may lead States or local governments to seek economies elsewhere—to consider such steps as rate regulation, limiting service areas through franchises or contracts, or as abolishing irrational jurisdictional boundaries that create obstacles to achieving proper economies of scale.

Such actions, in fact, are already beginning to surface in many areas across the country and undoubtedly will accelerate. This trend is of special importance to the private sector, given its very large role in solid waste management, since it raises the whole issue of the public-private sector interface in solid waste management.

I am sure that we feel strongly that the public has a right to environmentally sound waste services delivered at a reasonable price. We also feel that in light of the growing importance of the private sector and the public utility analogy drawn earlier, the public-private interface issue is a major one. Finally, we feel

that most States and localities currently are not well equipped to adequately address other than environmental aspects of private solid waste management services. We also realize that all levels of government are venturing into new and unfamiliar territory in this area and that states like Colorado, as they pioneer new arrangements like the public utility concept, on the one hand will be setting important precedents for the future and, on the other hand, have few historical lessons to guide them. We're very much concerned that these pioneering efforts be successful and that they set the proper course for the future. We're working closely with public and private bodies to assure such success.

resource recovery

Of greatest concern and interest to those concerned with the environmental aspects of solid waste management is the issue of—and the need for—resource recovery and recycling. To many Americans, there is perhaps no greater symbol of our imbalance with nature and our maladaptation to its realities than the fact that we discard millions of tons of wastes every year which do, in fact, have value. As William Ruckelshaus said last year, "The American people realize now that trash need not be mere junk. It has the potential of becoming a significant vein of resources, a mother lode of opportunity for men of vision who can see beyond the horizon."

The American people are right. And those of us who serve them can no longer view solid waste

management solely in terms of collection and disposal. We must help them understand, however, that something more than the magic of science and technology is required to convert all this waste back into useful resources.

In fact, in proportion to consumption, resource recovery has been steadily losing ground in recent years in virtually every materials sector. Approximately 200 million tons of paper, iron, steel, glass, nonferrous metals, textiles, rubber, and plastics flow through the economy yearly—and materials weighing roughly the same leave the economy again as waste. In spite of neighborhood recycling projects, in spite of container recovery depots, in spite of paper drives, anti-litter campaigns, and local ordinances banning the non-returnable bottle, in spite of the emergence of valuable new technological approaches, only a trickle of the “effluence of affluence” is today being diverted from the municipal waste stream.

The principal obstacles are economic and institutional, not technological. That is to say, the cost of recovering, processing and transporting wastes is so high that the resulting products simply cannot compete, economically, with virgin materials. Of course, if the true costs of such economic “externalities” as environmental impact associated with virgin materials use were reflected in production costs and if there were no subsidies to virgin materials in the form of depletion allowances, favorable freight rates and the like, the use of secondary materials would

become much more attractive. But they are not now, and there are no economic or technical events on the horizon, short of governmental intervention, that would indicate a reversal of this trend. If allowed to continue to operate as it does now, the economic system will continue to select virgin raw materials in preference to wastes. This fact should be etched into the awareness of those who look to recycling as a way out of the solid waste management dilemma.

To bring about recycling, our society is going to have to find ways to stimulate the use of secondary materials. In effect, we are going to have to stop subsidizing virgin materials use and take steps to assure that secondary materials can compete on an equal footing. Recycling, then, is essentially an economic, social and political question which must be resolved by an informed people in the economic and political arenas.

For this reason, EPA is currently examining a wide range of issues and problems associated with resource recovery through studies, investigations and demonstration grants. Included in these efforts are analyses of the potential impact of possible changes in tax policy (such as a tax on energy or virgin materials, changes in depletion rates, or tax credits to users of post-consumer wastes), transportation rates, and import/export regulations. The desirability of regulating virgin resource use from federally controlled land is also under study, as are the impact of State and federal purchasing specifications and the feasibility of

some national standards for waste use.

We are also initiating studies to determine types of products that could be made from wastes for which a demand exists, or could be developed, in agriculture or the construction industry, for example. Certainly, much more waste could be absorbed by industry, and we believe future research and development effort should be directed at the specific needs of the consuming industries—instead of at merely extracting materials and hoping that a market will materialize.

These studies are not going to go on eternally. We will conclude them as rapidly as possible with the goal of making some interesting and practical recommendations to the Congress in the very near future.

source reduction

Upgrading our collection and disposal systems to environmentally acceptable levels and maximizing the amount of waste we recover are important—but still only partial steps toward our society's and the world's goal of defusing the environmental crisis. The ultimate aim must be the reduction of both the waste we generate and the amount of resources we consume. We classify activities associated with this goal under the rubric of *source reduction*.

The issue of source reduction and its component parts or sub-issues are exceedingly complex. Understood by some, but not yet appreciated by most, it strikes at the very core of the way materials flow through our economy and the values, technologies, and traditions that determine that

flow. Although source reduction may in fact be the supreme environmental issue, it is at present only tangentially related to the field of solid waste management. To the extent that progress is not made in this area, however, unending burdens will continue to be placed, and probably at an increasing rate, on those responsible for handling the products of over-consumption.

For this reason and because it is every man's obligation to help close the ecological circle those in the solid waste management field should not turn their backs on this issue. We must with others explore and assess the viability of such options as: performance standards that will result in longer-lived products, the substitution for present waste-intensive processes of production those processes with low waste yields, substitution of products with low materials requirements for those with high material requirements, steps to ensure that products are not over-packaged. We must also seek to ensure that changes are pursued intelligently and that the environmental benefits of actions taken are greater than, or at least equal to, the economic and social costs of such actions. This will take time.

summary

I have attempted to describe, in capsule form, what I regard as major issues in the solid waste field, not only for today but for some time to come. I am not under the illusion that EPA's current efforts will "solve" the solid waste problem or

greatly lighten the burden shouldered by various levels of government or by private organizations. I do feel however that our current efforts—if effectively combined with the efforts of the other public and private organizations involved—will serve to show how some of the available opportunities in this field can be better taken advantage of and help throw a needed beam of light on the path we should take in the future.

We are not dismayed by the variegated and sometimes conflicting impulses to action that occur in the solid waste management field today. Instead, we are grateful for these signs of a new public awareness and energy, and we believe that organizations such as yours and ours should help channel this long-awaited public interest in meaningful and constructive ways.

As this is done, we can be certain that a public, already showing themselves willing to voluntarily limit the number of children they have, carry their bottles, cans, and papers to the local recycling center, and impose on themselves other personal sacrifices in the interest of saving the earth will, when properly informed, make the proper social decisions that will lead our society from the open dump to the closed circle in the solid waste management field.

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