

may be presumed to have economic advantages for the beverage and other using industries. But a trend back to bottles which can be reused might be in order on the theory that cost advantages to society also are worthy of consideration.

The salvage of valuable materials and energy potentials from solid wastes offers a most promising route to moderation of the pollution problem. Obviously, solid waste salvage not only reduces the physical burden of them, but adds to the Nation's resources.

Recovering heat from solid waste incineration has tremendous possibilities which have yet to be realized in the United States. One incinerator on the east coast has produced power for water desalination. The operation of power-generating incinerators is fairly common, however, in Europe. Under the national solid wastes program, two demonstration grants are supporting experimentation with incinerator heat conversion. Meanwhile, one of the program's research projects is investigating the feasibility of producing gas for boiler fuel by heating waste.

A major problem in salvage, as already has been suggested, is economic and fast separation of usable materials from unsalvageable waste. A west coast enterprise appears to have developed an automatic separation process which efficiently separates glass, metals, and other marketable commodities. Small glass particles thus salvaged can have a number of uses, including use as plastics and industrial fillers, and paint extenders. Occasionally, solid wastes can be used with little processing, as the incorporation of fly ash in building block and paving materials.

But often salvage requires fairly extensive processing to convert wastes into usable products frequently different from the starting materials. Both industry and the academic community are beginning to produce some interesting results in solid wastes conversion. Two research projects supported by grants from the Office of Solid Wastes are studying conversion through heating combustible wastes without the presence of oxygen, a process by which charcoal and coke have been made for generations. Marketable materials which may be obtained by this means include almost pure carbon, combustible gas, heavy tars, acetic acid, and acetones and alcohols. It is conceivable, incidentally, that carbon from conversion of solid wastes might be used to filter from water certain pollutants, which cannot be removed in present water treatment systems.

The use of solid wastes for land reclamation, either directly, as in a sanitary landfill, or after incineration or other processing can be considered a mode of salvage or conversion. Often the reclaimed land becomes valuable for golf courses and other recreational areas and adjacent property values are increased markedly. Three national program research projects and as many demonstration projects are directed at the development or testing of various methods of producing or using fill material from wastes without creating health hazards. Such projects would achieve, if successful, reductions in the volume of material and thus would increase capacities for solid waste disposal at landfill sites which are becoming increasingly scarce.

One such project offers the prospect of reducing landfill material from wastes to as little as one-tenth the original volume through high-pressure hydraulic compression. Another project will demonstrate a grinding process which would both reduce waste volume and so thoroughly mix the waste as to produce a fill unattractive to pests.

Composting, or the conversion of organic solid wastes into soil conditioning materials with fertilizer value, has been less widely attractive in this country than in Europe because of economic considerations and the competition of chemical fertilizers. But within the national program, composting is regarded as a promising route to solid waste disposal. The great accumulation of crop and animal wastes in areas of agricultural concentration adjacent to localities of rapid urban growth justifies taking a good look at composting. While composting may never prove to be a profitable commercial enterprise, it might produce enough revenue to help offset disposal costs.

And, of course, we want to satisfy ourselves that composting will be acceptable from the standpoint of human health protection.

One of our research grant projects is working on a method for composting fruit and vegetable refuse, without endangering health or causing objectionable odors. Other investigators are looking into possible health hazards from insecticide residues in composted agricultural wastes.