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yield more in revenue than they cost to operate. Some systems might show a profit if cost savings accruing from the long-range benefits involved were to be calculated.

Disposal costs can be reduced by cutting back the quantity of waste for which a municipality must provide ultimate disposal. Savings also can be produced by reducing the quantity of virgin resources mined, pumped, or cut and thus extend raw material supplies. Recycling technology simply does not now yield products which are competitive on a cost basis with those made from virgin resources. And recycling systems aren't likely to be given very serious consideration if recovered materials cannot be sold at a fair price — which isn't going to happen unless a considerably larger market develops than now exists. While it is essential to make

waste commodities accessible by improving technology, simply creating a supply will not ensure a demand. Limited demand, not supply, is in fact the main barrier to increasing recycling.

Obstacles relating to limited demand

On a nation-wide basis the industrial demand for reclaimed metals and other commodities actually has been declining when compared with the increased use of virgin materials, as shown in the following table.

Federal, state, and local laws, regulations, programs, and policies often operate to hold down the market demand for recycled products. Producers of virgin materials are entitled to depletion allowances, capital gains and other tax advantages not accorded to salvagers of the same products.

They also enjoy much lower freight rates. Until recently it cost 250 percent more to ship a

Industrial Demand* for Selected Metals (in thousand short tons, except tin)

Metal	Year	Secondary Demand for Post Consumer Scrap	Industrial Demand	Percentage of Secondary Demand To total Demand
Iron	1951	37,800	104,600	36.1%
	1970	33,000	116,900	28.2%
Aluminum	1951	77	999	7.7%
	1970	177	4,128	4.0%
Copper	1951	458	2,183	21.0%
	1970	504	2,820	17.8%
Lead	1951	442	1,078	41.0%
	1970	506	1,335	38.0%
Tin (in thousand long tons)	1951	31	88	34.8%
	1970	20	73	27.0%

ton of steel scrap than it did for a ton of raw ore. Secondary materials dealers argue that federal regulation of interstate transportation is indifferent to their need to deliver scrap materials to purchasers who will recycle them. In reply, the Interstate Commerce Commission says that actions such as its recent order allowing truckers to make application for hauling waste products for recycling at less than the published rates shows that it is responsive to the public interest.

Operating more indirectly to limit market demand are purchasing specifications based on material, not performance. Labeling standards intended for consumer protection but reflecting special-interest considerations (e.g., "reprocessed" wool) also discriminate subtly against recycled products. Zoning regulations and land use plans often provide no sites for auto-salvage yards, in which case a greater number of junked autos become part of the municipality's disposal problem.

While the use of recovered commodities by manufacturers sometimes is suspected to be uneconomical, industry has responded with research and by participating in many ways in recycling programs. Some industries have increased their reuse of scrap commodities while many others haven't done so because not enough material of high quality is available at costs competitive with virgin raw materials. Some critics label industry participation in recycling as merely a public relations effort, but we should

remember that under our economic system industry is encouraged to maximize its profits.

Crucial decisions lie ahead

Recycling may have to be subsidized for whatever period is needed to wean industry away from a nearly exclusive reliance on virgin resources. If the choice of material is to be made on the basis of what is environmentally best, then the full cost including environmental social costs will have to be paid. And of course most of the added expense eventually will probably be passed on to the consumer.

All that has been said should be enough to indicate that an economic incentive system which produced the desired result would require complicated adjustments in the processes of production, distribution, and consumption. It also is apparent that creating incentives involves political, legislative, and administrative tasks probably requiring a relatively long time to accomplish.

No attempt will be made here to assess the importance of particular legislative proposals since this would be mostly a speculative endeavor. But it can be said that the re-orientation of material-use patterns will not be

painless economically. Success will depend to a very large extent on public support. Citizen participation will be vital in any decision-making about municipally-sponsored recycling efforts.

And whatever the ultimate choice of a municipality might be, it certainly would be a mistake to put off using any effective means of resource conservation now available while anticipating that some day commodities will be transformed into high quality materials that everybody wants.

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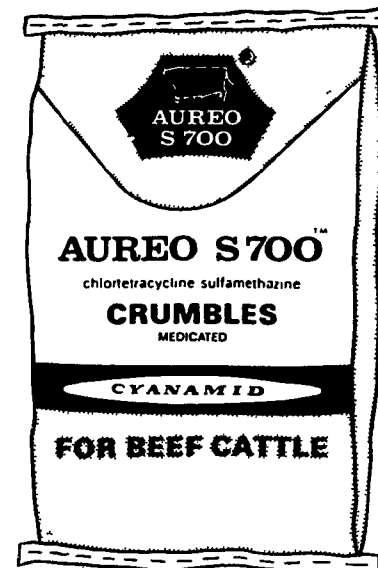
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