The Ore Bin

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STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

The Ore Bin

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RECYCLE TO EXTEND OUR RESOURCES

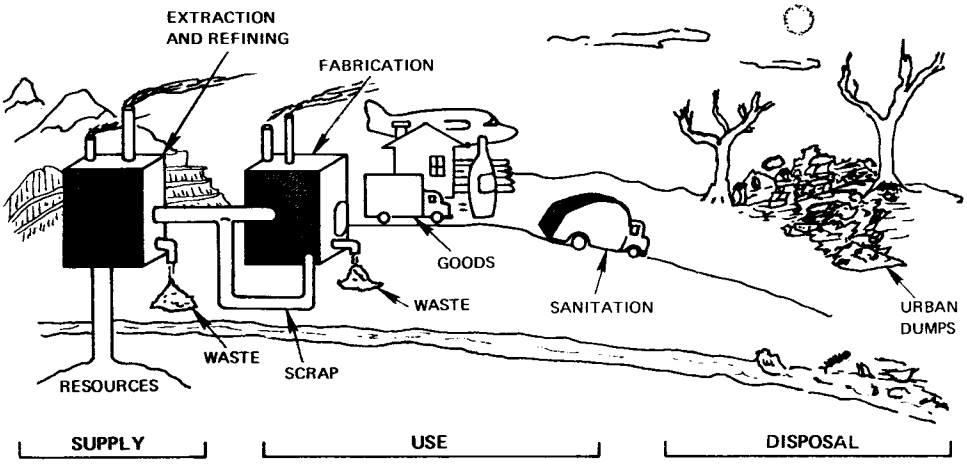
In the late nineteenth century, the mineral industry was concerned with discovering new deposits of ore and mining them. The demands of the manufacturer and of the consumer were not great, and only the easy, high-grade ores were mined. As these dwindled, improved mining technology made it worthwhile to mine lower-grade ores, often at a higher cost. Meanwhile, our escalating demands for more material conveniences at a cheaper price encouraged importation of increasing quantities of minerals.

This century has brought widespread manufacturing of an endless array of mineral products ranging from gigantic jet planes to tiny transistors, including millions of automobiles, miles of aluminum foil, and mountains of tin cans -- not to mention ditches full of beverage bottles. Our technology concentrated on the "throw it away, there's more where it came from" philosophy, or what we have come to call planned obsolescence.

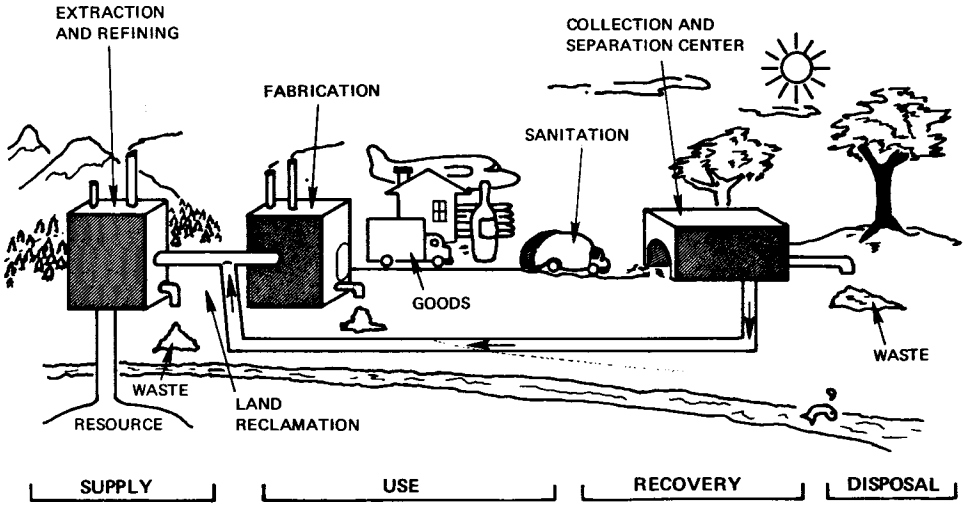
Now almost suddenly industries are discovering what the geologist has been saying -- there is a limit to the earth's mineral and fuel resources available for exploitation. We are entering an era of accepting the necessity to extend the life of our resources, including recycling of discards. The National Center for Resource Recovery, Washington, D.C., estimates that our yearly industrial and residential waste contains $5 billion worth of metals.

According to a 1972 report by the Environmental Protection Agency, "Report to Congress on Resource Recovery," complete recycling of metallic wastes would have a dramatic impact on a number of environmental problems. Making 1,000 tons of steel from scrap rather than ore would result in a 90 percent savings in natural resources, a 74 percent savings in energy consumption, an 86 percent reduction in air pollution, a 40 percent reduction in water use, a 76 percent reduction in water pollution, a 97 percent reduction in mining wastes, and a corresponding reduction in consumer wastes generated. Recycling of other products would likewise have a significant effect.

In this issue of The ORE BIN, we consider recovery and reclaiming of discarded mineral products. In doing so, we have borrowed freely from the Phoenix Quarterly, published by the Institute of Scrap Iron and Steel, Inc., especially for the first four articles that follow. To report what is going on in Oregon, particularly in Portland, Carol Brookhyser has gathered information from such local sources as the Recycling Switchboard of the Oregon Department of Environmental Quality and the companies involved in recycling.



OPEN-ENDED MATERIALS SYSTEM. Mineral resources are mined, go to a refinery, are made into consumer goods, which are used, discarded, and hauled to a dump where they contribute to environmental degradation.



CLOSED MATERIALS SYSTEM. Mineral resources are combined with recycled materials, are refined, and made into consumer goods which are used, saved, hauled to collection and separation centers, and are returned to the refinery. Completing the circle conserves energy and raw minerals and improves the environment.

From: Material Needs and the Environment Today and Tomorrow

Is Steel the Only Thing You Recycle?

No, many metals and combinations of metals can be recycled. Steel is a combination of iron and carbon plus small traces of other elements. Because it contains iron, steel is a ferrous metal. Stainless steel is also considered a ferrous metal. Stainless steel has become nearly as ubiquitous in the late 20th century as steel, but it only came to prominence during the forties when its heat resistant properties made it important in war production. Then the development of the airplane assured its continued use. Now it is everywhere. Widely used in the home, particularly in the kitchen, because of its resistance to rust, stainless steel appears as cooking equipment, equipment parts and trim. Many of us eat with stainless steel "silverware."

There are many varieties of stainless steel. As an alloy - a mixture of two or more metals - its proportions can be varied in the melting to produce a stainless steel whose specific characteristics will make it exactly suited to the particular function the end product will perform. In general, however, there are two types of stainless steel - chrome stainless and nickel stainless. Chrome stainless is an alloy of chrome and steel. It is magnetic. A non-magnetic, more expensive stainless is made from nickel, chrome, and steel. There are hundreds of variations of these themes.

Like iron and steel scrap, stainless steel scrap can be recycled endlessly, taking on new forms as habits, styles, and technology change. Scrap firms who process stainless steel collect it from both household discards and industrial and manufacturing sources. Once gathered into the scrap plant, it must be carefully sorted so that the processor can provide the buyer with his exact needs. Because there are so many varieties of stainless, the sorting process is extremely important. Methods range from the most complex processes of the space age, such as spectrograph analysis, to sorting by hand. Other methods include testing by acids and spark testing. Scrap processors who handle large quantities of stainless say hand sorting remains the most widely used technique. Processors know that particular items - an airplane engine part for example - are usually made from the same grade of stainless. Once sorted, the stainless scrap is sold to those steel mills which melt and manufacture stainless steel.

Copper and its alloys form another branch of the recycling industry - a non-ferrous branch. Copper, a mined, natural resource, grows scarcer day by day. Recycling this essential metal is increasingly important, especially in an energy-tight era when recycling requires substantially less fuel than extraction of raw materials.

Neither copper nor its alloys are as visible in the home as stainless steel. Copper's heat-conducting properties make it popular for electrical wiring, and its corrosion resistance enables it to carry water well. However, the use of both copper and steel for pipe and plumbing fixtures in the home is being challenged by plastics.

Nor are the copper alloys - bronze and brass - frequently found in the home. Formerly brass candlesticks and chandeliers adorned homes and public buildings and bronze decorations were common. Today's brass candlestick is likely to be brassplate, and a crafty shopper would go armed with a magnet to be sure items labeled solid brass are in fact that. Brass materials will not take a magnet, brassplated material will.

Most recycled copper-based items are not household scrap. Electric utilities use quantities of copper in generators and turbines. Transmission lines are generally copper. The auto industry is a big copper user. These are some of the sources of copper and its alloys for recycling. In 1967, 49.7 percent of copper consumed in the U.S. was recycled copper.

These materials are sheared and baled or otherwise processed and sold either to brass mills which manufacture a product or to ingot manufacturers who melt the copper, bronze, or brass and make ingots conforming to precise specifications. These are in turn sold to the manufacturer for remelting and formation into the final product.

Aluminum is another recyclable metal. Some 18.3 percent of aluminum consumed in 1967 was recycled, and the percentages rise annually. Aluminum-can recycling is discussed on page 63. But aluminum appears in many guises in both industry and the consumer world. Lawn furniture, high-speed bicycles, automobile trim and components, foil, all are made of aluminum and can be recycled as easily as cans.

Many scrap processors have aluminum melting furnaces in their scrap plants where they condense bulky items into aluminum ingots. These furnaces separate aluminum from other substances and enable recovery of both materials. Once melted, the ingots are shipped to aluminum manufacturers or refiners to begin another trip on their endless recycling journey.

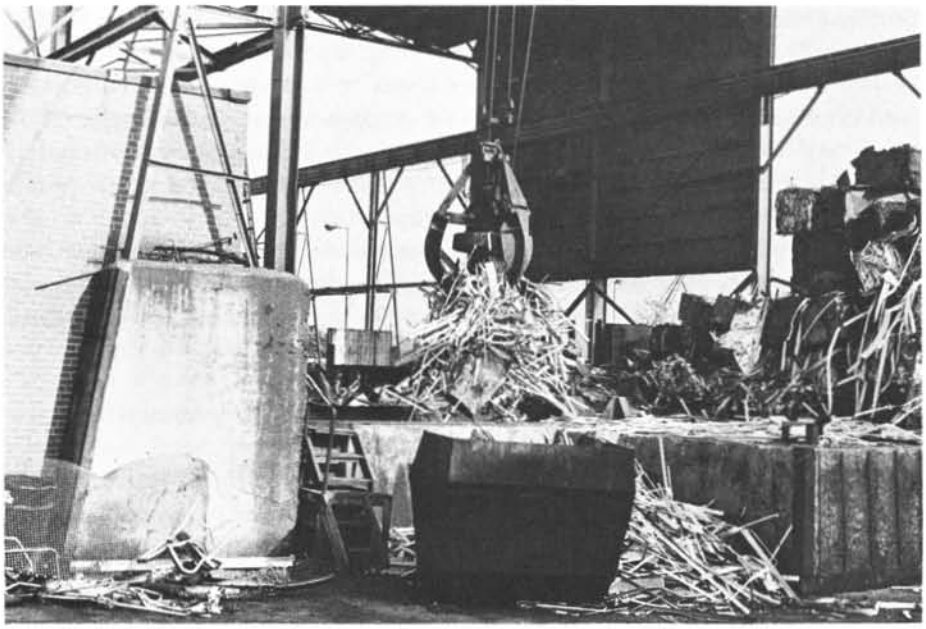
Where Do You Get All That Scrap?

Scrap comes from everywhere. The automobile is an obvious rich source of scrap. So are the home, office buildings, industries, and manufacturing plants, railroads. Anything made from iron and steel or any other metal may be taken into the scrap cycle and used again. However, iron and steel scrap is found in the largest quantities.

Aside from the auto, the manufacturing industry is the largest source of scrap. If a manufacturer makes scissors, for example, or gears, or puts threads on screws, the metal left over once the principal operation has been performed is scrap - an industrial by-product. Sometimes industrial scrap is sheets of cutouts, sometimes millions of tiny fragments. Though it is usually clean and easily recyclable, occasionally it has picked up contaminants in the manufacturing process, oils and grease for example, which make that scrap more difficult to recycle.

Scrap processors who prepare industrial scrap use essentially the same machines and techniques used on other sorts of scrap. Once brought into

Old rusted automobile bodies enroute to the "Goldfinger Machine" for eventual reclamation of valuable metals.



Metal strips from the slicing machine on their way to the baler.

(Photos courtesy of Phoenix Quarterly)

the scrap processing plant, ferrous scrap is separated from non-ferrous and then prepared for shipment to the mills or foundries which will recycle the metal. Sheets can be baled into bundles; rods and bars may be cut to uniform lengths; smaller fragments may be converted into small units about the size of bricks that are called briquettes.

Industrial scrap is a very important part of the scrap processing industry. In manufacturing operations a significant percentage of the metal used generally is left over when the product is finished. Without the highly organized reclamation system, enormous quantities of steel and other metals would have been wasted over the years and brought the nation much closer to the edge of natural resources depletion.

Railroads are a source of scrap - old rails, freight cars themselves, and much of the paraphernalia that enables a railroad to function are made from steel. These all can be and are recycled through the scrap processing system to become new rails, freight cars, signal lights, foundry castings, and iron and steel products for other uses.

Obsolete, as contrasted with industrial scrap, old autos, obsolete household appliances and miscellaneous metals find their way to the scrap processor by various routes. Some cars and appliances are brought by their owners to the scrap plant; others are sold to an auto wrecker who removes the salable parts. He sells the remaining hulks to scrap processors.

Another source of scrap is the junk collector. Not so prominent a feature of the modern landscape as he was in former times because of current economic conditions, the junk collector gathers up papers, rags, and metallic items such as old radiators, fencing, appliances, sorts them, and sells them to those who process them - paper to a paper mill for manufacture into recycled paper, metallic items to a scrap processor to be prepared for use in mills, refineries, and foundries. When buildings are demolished, the steel that made up the structure generally passes through the scrap plant enroute to recycling in steel mills and foundries.

Everything metallic is potentially scrap. It can come from anywhere to the scrap processor who can turn it into a valuable resource. This role will become increasingly important as the United States and other nations learn to live within the limited resources of the earth.

Do Scrap Dealers Use That "Goldfinger Machine"?

Yes, the baler, "that Goldfinger Machine," operates just as was graphically demonstrated in the James Bond film. It hydraulically compresses autos into a bundle about the size of a console television set which conforms to a precise specification in the scrap market - a No. 2 auto bundle.

Scrap dealers are often said to be conserving the future. And so they are. Millions of automobiles are lying around America rusting into oblivion; the scrap processor can reclaim their valuable metals and get them back into the economic stream. In so doing, he performs the vital service of conserving

natural resources. Each time scrap iron and steel is used instead of ore, the day of mineral exhaustion is postponed.

When an auto arrives at a scrap processing plant, it may already have been stripped of usable parts for resale by auto wreckers. What is left is prepared for sale to the steel or foundry industries, and the baler is the best known equipment used for this.

Another method of auto processing is flattening cars and passing them through a giant slicing machine known as the hydraulic guillotine shear. The shear produces a sliced material of a predetermined size.

A relative newcomer to the scrap processing industry is the shredder. A shredder is a very expensive, sophisticated machine, ranging in cost from $1 million to $5 million.

The shredder does just what its name implies. It ingests automobiles from which tires and gas tanks have been removed and, sometimes in much less than a minute, reduces it to pieces of steel, glass, plastic, and other metals about the size of a fist. These shredded particles are then passed over a series of magnetic drums and separation systems until the final ferrous product is virtually pure steel.

A problem for auto scrap processors which promises to worsen is the increasing percentage of an automobile which is not steel. Through auto industry efforts to lighten auto weights or to attract consumer tastes with design additions, the steel portion of an auto has dropped from over 90 percent to 74 percent in 1972. And many signs point to a continuing decrease in the use of steel in cars. Consequently, scrap processors will have less steel per auto coming out of their shredder or in their bundle or slab and more non-ferrous or non-metallic products with which to deal. Some are valuable, such as aluminum, zinc, and copper, if separated economically. However, upholstery, glass, and plastic have as yet little or no place in the recycling system. Methods for recycling of even these materials are being developed. For instance, a pilot project by the U.S. Bureau of Mines recently investigated the use of waste glass in the manufacture of glass wool.

All scrap processing machines can be used to process other types of scrap besides autos. The baler can be used on a variety of materials, from cans to wire; the shear slices sections of steel plate and pipe as easily as an auto; and the shredder can rip most metals to recyclable size. But all are important in processing that most obvious article of recyclable steel - the automobile. Each time they bale, slice, or shred, they help extend the nation's limited supply of natural resources.

How Many Cans To Make a Ton?

It depends on what kind of can you are collecting. If it is "tin" cans, which are actually tin-plated steel cans, you will need to collect 18,000 to 20,000. If you are collecting aluminum cans you will need 40,000. That is a lot of cans.

Usually Scout troops, civic groups, or environmental organizations collect cans in somewhat smaller quantities, by the bag or the stationwagon full. Some groups have centrally-placed dumping bins whose contents are collected regularly. Hardly anyone piles up a ton of cans before disposing of them. Most people just don't have the room.

Since the dawn of the environmental era, many people have tried to recycle cans. These efforts have been frustrated by the distance of most urban centers from the markets - the steel mills and aluminum manufacturers - and the above-mentioned quantities in which cans must be collected to be significant in the marketplace.

Aluminum is a more expensive metal to extract and produce, so aluminum companies are willing to pay a relatively high price for aluminum cans for recycling.

Tin cans are less valuable but equally recyclable. (First, they are usually detinned.) Detinning plants collect cans and other tin-plated scrap - the latter including waste material from factories that produce the cans themselves. Once collected, the cans are shredded and thrown into a detinning solution; a caustic, alkaline solution which removes the tin on the cans. One producer estimates he recovers 7 pounds of tin from a gross ton (2,240 pounds) of cans. After detinning, the shredded steel is washed to remove any dissolved tin, compressed into a bundle of high quality scrap and shipped to a steel mill for recycling into new products. The tin, meanwhile, is recovered in a pure form and also sold for manufacturing. Tin-plated cans may be added directly to steel furnaces in limited quantities but the industry says it prefers to take detinned cans.

Easy as it sounds, there are some stumbling blocks. For one, not all the cans are clean. Consider the can which once held stewed tomatoes or macaroni and cheese. Once its contents have been emptied, into a trash bag it goes, unwashed, uncrushed. All those food particles show up in the detinning solution with resultant difficulties for the detinner. For this reason as well as the problem of rodent and insect infestation in each phase of handling, most recycling centers require that cans be clean.

Steel cans also are used for copper precipitation. There the cans are placed in a copper sulphate solution which is the result of copper extraction. The steel replaces the copper in the sulphate solution, leaving behind the more valuable copper.

Using tin cans for either copper precipitation or to make new steel extends limited supplies of natural resources and encourages resource self-sufficiency. And with energy growing scarcer every day, it is important to note that the Environmental Protection Agency has found that using scrap rather than iron ore to make steel uses 74 percent less energy. Other environmental problems - air pollution, water pollution, mining wastes and water use - all are significantly reduced when steel is made from scrap instead of ore. So as the nation looks for ways to stretch its energy and solve its environmental problems, even the humble can has a role to play.

What is being Recycled in Oregon?

Autos and household appliances

The biggest car shredder installation in the Pacific Northwest has been pulverizing cars in Portland at the rate of about 250 to 300 cars a day for the past 4 years. Cars, however, are not the only material recycled by the Schnitzer Steel Products Co. machine. The company buys discarded household appliances from junk dealers. Items such as stoves, laundry equipment, refrigerators, hot water heaters which cannot be handled by a scrap baler can be fed into the shredder and reduced to fist-sized pieces of scrap.

The local pulverizing operation accepts only cars which are beyond rebuilding - literally wrecks. Before these are processed, the interior padding such as seats and rugs is removed. Window glass becomes part of waste debris since there is currently no local recycling use for this type of glass. Motor blocks may be left in or may be sent to steel mills as a separate scrap item.

The cars are fed through powerful rollers which flatten them, then into the drum pulverizer where sixteen hammers chop through metal and glass. Contaminants are sucked from the conveyor as the metallic remains move to magnetic separators. Originally the non-ferrous (and therefore non-magnetic) materials were picked out by hand from the scrap, but now a more economical mechanical system separates the valuable copper and zinc from the ferrous scrap.

The shredder operation produces the almost-pure ferrous scrap needed for mixing with iron ore in the oxygen furnaces developed in the 1950's for use in steel mills. It was the need for this purer scrap that led to the development of the shredder to replace the baler previously used almost entirely for processing auto scrap. Since the baler crushed the entire car, the percentage of contaminants was generally high, and although the new shredders can handle the baled car (No. 2 car bundle discussed earlier), the operator must be certain it is "clean" scrap in the bale and that upholstery, dirt, rocks, etc., are not included.

The cars and other scrap being processed at the Portland shredder may come from all over Oregon, eastern Washington, Idaho, and even western Montana. The freeway system in Oregon is one important factor in the economics of hauling scrap from long distances. As the price of scrap rises, longer hauls become feasible.

Dr. Leonard E. Schnitzer, Vice President of the steel company, reports that cars being scrapped locally now might be termed current production, that the accumulated "old junkers" of the past were cleaned up in the first few years the shredder was operating. He says it is possible that the northern United States is now being covered rather thoroughly by truckers hauling scrap; some from western Montana is being brought here, and that from eastern Montana and the Plains states is going into Chicago and Kansas City.

Crushed car bodies ready for shredding machine at Schnitzer Steel Products Co., Portland.

"End of the Trail" at the dismantling yard of Schnitzer Steel Products Co., Portland.

(Photos by Sherman Washburn, Oregon State Health Division)

Recycling of metallic scrap materials is dependent on a geographically convenient source of supply, proximity to scrap markets, and freight rates which make it possible for scrap to compete with virgin materials. The coast areas become the natural locations for these operations because of population density and the lower cost of moving scrap by water to steel mills both in this country and abroad. The major market for much of U. S. scrap has been Japan, but steel mills in this country are increasing their consumption of recycled materials, and the industry is working with railroads to improve freight rate competition. At the present, ore moves at a lower rate than does iron and steel scrap, and the inequities tend to increase as hauling distances increase.

Aluminum cans, foil, and TV dinner trays

Aluminum is a metal that can be recycled endlessly; so far as is now known, there is no weakening with reuse. Since much aluminum production goes into consumer goods, the average person is important in the reuse cycle.

The Reynolds Metals Company has a recycling depot at its guard office at the Troutdale plant, where, each Saturday, groups or individuals may resell their discarded aluminum. Reynolds will take aluminum beverage cans, pie pans, TV dinner trays, aluminum wrap, lawn or house furniture frames with upholstery, webbing, and bolts removed. Food contamination must be cleaned from containers and foil. Car parts and cooking utensils are a different alloy and cannot be accepted by the Troutdale plant.

In Oregon 30,000 to 40,000 pounds of aluminum are recycled per month. From Reynolds it is shipped to Seattle for shredding and then sent east to a smelter. The in-plant scrap at Troutdale is reused at the plant.

Aluminum production is a high consumer of energy; about 15,000 kw of electricity is needed to produce one ton, but recycling that ton requires only about 450 kw. Amounts now being recycled in the U.S. are equal to one year's production of new metal from one potline. Since aluminum is one of the most valuable metals, it is estimated that municipal garbage containing 1 percent of aluminum waste could be economically processed for the recovery of that metal alone.

Tin cans

Tin cans are a component of the average household garbage and are easy to recycle. They should be rinsed out first (see page 60 regarding need for rinsing cans), have labels removed, and be flattened.

The Continental Can Co. is the largest handler of recycled tin cans in the Portland metropolitan area. Their suppliers are mainly non-profit groups and individuals. The company records amounts brought by groups and when any one group has accumulated deliveries totaling a ton, payment is made. Weight of cans brought in by individuals is combined with that of company

scrap, and a contribution to cover the total is made by the company to an environmental or charitable organization.

Over 900,000 pounds of scrap cans were received by the Portland plant during 1973 and shipped to steel mills or to copper refineries.

Cans which contained pesticides should never be recycled. The Department of Agriculture warns that many pesticides remain highly toxic for a long period of time. What is considered an empty can or bottle may actually contain a lethal dosage of pesticide. Even when buried it will eventually break or rust away, allowing the contaminant to soak into the ground. Only a commercial pesticide operator should handle the recycling of pesticide containers.

Glass bottles

Glass bottles originate from a melt of raw materials (sand, limestone, soda ash, and feldspar) that have to be mined out of the ground, shipped to the glass factory, and processed. The making of glass not only uses up mineral resources, it consumes energy in all steps from mine to finished product. Energy resources, like mineral, are finite.

Glass is the one product most frequently and most easily recycled by the individual. Recycling of glassware is becoming a routine in most households and a source of income for many non-profit groups and for some small businesses.

The Owens-Illinois Glass Co. of Portland started a redemption center in midyear of 1970 and in the first month of operation recycled approximately 5,000 pounds. In February 1974 the center accepted over 1,200,000 pounds and expects about a million pounds per month, mainly from the Portland area, but loads also are brought in by groups from as far as Medford, the Tri-Cities area in Washington, and from the nearest Idaho towns.

Broken glass, called cullet, is a necessary part of the glass-making process and is used at a ratio of 20 percent cullet to 80 percent virgin minerals in a given batch. At the Portland plant 6 to 8 percent recyled glass and 12 to 14 percent rejected glass from the production line make up the cullet. At the present time all of the recycled glass received is being used in in the plant's production of 8,000 to 10,000 tons of glass containers per month, and the percentage of cullet could be increased appreciably if more recycled glass were received.

Any glass turned in for recycling must be free of metal lids or the metal rings sometimes left on necks of bottles after removal of certain types of lids. The possibility of any contamination from metal debris is the reason the Portland plant cannot now use glass residue from a garbage processing operation. Although there is more sophisticated machinery available to handle this possible contamination, the Portland plant does not yet have it. Metal contamination causes defects in the glass product, such as gas bubbles, or settles to the bottom of the furnace, creating hot spots.

A ton of tin cans?

Environment-conscious householders wash, flatten, and collect their tin cans for the local recycle center which sells them by the ton to the Continental Can Company. (Photo from The Oregonian)

Bottles and more bottles!

Non-returnable glass bottles are gathered, crushed, and trucked to the Owens-Illinois glass plant in Portland for recycling. (Photo from The Oregonian)

The Portland plant was closed recently for a short period because of a shortage of soda ash, an essential ingredient in the making of glass. Nearly half of the yearly U.S. production of soda ash goes into the manufacture of glass, and in recent years soda ash production has not increased in proportion to the increased demand for glass products. The Wyoming trona deposits, main source of natural soda ash, are being mined more intensively, but Solvay-processed soda ash decreased because of closure of some older plants due to stricter limitations on chlorides in plant effluents.

Since Oregon's "Bottle Bill" went into effect, a definite change has been seen in container use. There has been a 62.8 percent increase in use of returnable bottles for beer and a 31 percent increase for soft drinks. Beer bottles are re-used about 15 times and soft drink bottles 19 times.

How Can I Get Into The Recycling Act?

Return your returnables and save your recyclables. For a copy of the Recycling Handbook or for information on recycling centers (locations, hours of operation, kind of materials), and for answers to other questions, contact the Department of Environmental Quality, 1234 S. W. Morrison, or phone their information number in Portland:

RECYCLING SWITCHBOARD
229-5555

Information on where to take your recyclables is also available from DEQ district offices in Salem, Eugene, Roseburg, Bend, and Pendleton.

Where Can I Get More Information?

RECYCLING HANDBOOK: Free on request from Recycling Information Office, Oregon Dept. of Environmental Quality, 1234 S.W. Morrison, Portland, Oregon, 97205.

PHOENIX QUARTERLY: Published quarterly by the Institute of Scrap Iron and Steel, Inc., 1729 H Street N.W., Washington, D.C. 20006.

STEEL FACTS: Published quarterly by American Iron and Steel Institute, 1000 16th St. N.W., Washington, D. C. 20036.

SOLID WASTES: Contains 25 articles reprinted from Environmental Science & Technology. Order from Special Issues Sales, American Chemical Society, 1155 16th St. N.W., Washington, D.C. 20036, price $2.00.

MATERIAL NEEDS AND THE ENVIRONMENT TODAY AND TOMORROW: Report to the National Commission of Materials Policy, June 1973. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Paper cover, postpaid $3.20.

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PROPOSED U.S.F.S. MINING REGULATIONS QUESTIONED

Rep. John Melcher (MT), chairman of the Public Lands Subcommittee of the House Interior Committee, stated at hearings held March 7 and 8 on the proposed Forest Service mining regulations that his subcommittee would take a careful look at the authority of the Forest Service to promulgate these regulations. He also said that he had been assured by Forest Service Chief John R. McGuire that the regulations would not be published in final form until the House Public Lands Subcommittee has had a chance to thoroughly review the regulations.

Stanley Dempsey, general attorney, western area, American Metal Climax, Inc., and chairman of the Forest Service Regulations Subcommittee of the American Mining Congress Public Lands Committee, presented the association's views on the proposed Forest Service regulations.

Dempsey stated that AMC believes that the Forest Service is without authority to promulgate any regulations that may preclude access and mineral development on the national forests. He listed specific problems created by the regulations, including the conflict between the regulations and state mining-claim location laws, the possible delays in approval of a plan of operations, the necessity for filing an environmental impact statement, and the inadequacy of the draft environmental impact statement filed with the proposed regulations. Dempsey emphasized that implementation of the regulations will discourage exploration for and development of mineral resources in the national forests, with the result that the U.S. will be forced to rely even more on imports.

Under questioning, Dempsey indicated that it would be most difficult for the small miner, who is most essential in mineral exploration, to secure the bond required by the regulations. As to the impact the regulations would have on his company, Dempsey said that exploration efforts would be slowed significantly. He emphasized that the regulations are aimed at regulating mining, whereas they should be self-executing, aimed at protecting the forest resources.

Forest Service Chief McGuire was questioned in regard to the authority of the Forest Service to promulgate mining regulations on national forest lands. Rep. Sam Steiger (AZ) said to McGuire, "I'm convinced you've got a problem...and that in your approach you have compounded the problem." Questions then shifted to whether the Forest Service has adequate funds and manpower to administer the regulations. Other members of the subcommittee expressed to McGuire their concern with the present minerals shortage and the dampening effect of the regulations on mineral exploration and development. Concern was also expressed that the regulations would eliminate the small miner, especially with regard to the unreasonable bonding provision.

Rep. Harold Johnson (CA) expressed his concern whether the impact and intent of laws enacted by Congress can be modified drastically by

administrative regulation. He said he was convinced that the regulations are most unreasonable and will work extreme hardship upon the minerals industry, especially upon the small prospector and miner.

-- American Mining Congress News Bulletin No. 74-6.

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REPEAL OF HARD MINERALS DEPLETION ALLOWANCE PROPOSED

On April 1 the House Committee on Ways and Means, during its deliberations on the windfall profits tax bill, voted 18 to 7 to eliminate the percentage depletion allowance for oil and gas over a three-year period.

During the discussion on this subject, Chairman Wilbur D. Mills (AR) stated that it was his intention to end the depletion allowance for all other minerals in connection with tax reform. The following day, April 2, an amendment to eliminate the depletion allowances on all minerals barely failed of passage in the Ways and Means Committee by a tie vote, 12 to 12. However, the committee will again consider mineral depletion allowances.

-- American Mining Congress News Bulletin No. 74-7.

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GEOTHERMAL POTENTIAL IN SOUTH-CENTRAL OREGON INDICATED

"Some Implications of Late Cenozoic Volcanism to Geothermal Potential in the High Lava Plains," by George W. Walker, has been released as an open-file report by the U.S. Geological Survey. Volcanic rocks related to the Brothers fault zone extending from Harney Basin to Newberry Volcano show decreasing age westward, with probable greater geothermal potential at the western end.

The 14-page report has an index map, structure map, and table of potassium argon dates. Copies of the report are available for $1.50 each from the Oregon Department of Geology and Mineral Industries at its Portland office.

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FIELD-STUDIES REPORT ON OPEN FILE

"Field-oriented geology studies in Oregon, 1973," prepared by John D. Beaulieu has been placed on open-file in the Department's library. The report is a listing and brief summary of all known geologic projects that were conducted in the field in Oregon during the past year. In addition to aiding the Department in planning programs, the report enables the interested geologist to keep informed of recent research.

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AVAILABLE PUBLICATIONS

(Please include remittance with order; postage free. All sales are final - no returns. Upon request, a complete list of Department publications, including out-of-print, will be mailed)

BULLETINS

8. Feasibility of steel plant in lower Columbia River area, rev. 1940: Miller . . . $0.40
26. Soil: Its origin, destruction, preservation, 1944: Twenhofel 0.45
33. Bibliography (1st suppl.) geology and mineral resources of Oregon, 1947: Allen. . 1.00
35. Geology of Dallas and Valsetz quadrangles, Oregon, rev. 1963: Baldwin. . . . 3.00
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