

A Garbage Crisis?

Tanja Vogt, a student at West Milford High School in New Jersey, read a newspaper article about the local school board. The board had decided to continue using food trays made of Styrofoam (a trade name for foamed polystyrene plastic) in the school cafeteria. The cafeteria served food on polystyrene trays because they cost a nickel less than paper ones.

Tanja had learned in her science class that polystyrene was not biodegradable. It would stay in a landfill forever. “I asked myself, why would we use these things if they’re harmful to the environment?” Tanja said. She and her friends campaigned to get rid of the plastic trays and even persuaded students to pay an extra nickel. The school board changed its mind.¹

Most parents and teachers would be proud of Tanja and her classmates, and they should be. The students perceived an environmental hazard and took action. The only problem is that their action was based on inaccurate information about solid waste disposal since plastic trays are not necessarily more harmful than pressed paper trays. By some measures, they are more environmentally sound.

Too Much Garbage

Our children are taught that North America faces a garbage crisis. They learn that our wasteful life-styles produce too much garbage, that each Canadian produces more garbage than anyone else in the world, more even than Americans, and that there is no place to bury it.

- ◆ “On average, about one-third of the garbage you produce is packaging. If every North American family could avoid packaging completely, there would be nearly 10 million fewer garbage cans full of garbage each year in dumps.” This suggested by the children’s book, *Earthcycles and Ecosystems*.²
- ◆ Several textbooks tell the story of the Mobro garbage barge that left New York City in 1988 looking for a place to dump its cargo of three thousand tons of garbage. Rejected by states all along the East Coast, the barge cruised to Mexico, Belize, and the Bahamas seeking a place for its garbage. The wandering barge appeared night after night on the news and became a focus for the garbage debate in the United States. But, in the end, it returned to New York and was allowed to deposit its cargo, which was incinerated in Brooklyn.³ As it is generally told, however, the story conveys the idea that space for garbage is scarce and getting scarcer.
- ◆ The text *Science Directions 9* points to “the steadily increasing volume of solid waste that must be disposed of. Landfill sites quickly become filled. It is increasingly difficult for local governments to find new sites for solid waste disposal because many people do not want these sites near their community.”⁴

Students are also taught that products that “biodegrade” or decompose are environmentally preferable to those that don’t.

- ◆ Biodegradable wastes “can be broken down and changed,” says the text *Journeys in Science*. It goes on to say: “Plastic does not break down in the Earth. Therefore, plastic objects add to the problem of land pollution.”⁵

- ◆ Environment BC’s *Green Team* told a grade seven class in Vancouver, British Columbia: “To make plastic, they take oil, from deep down in the ground, they mix it with six to ten of the deadliest chemicals known to human beings, they mix it to make plastic.”⁶

- ◆ *Science Directions 8* discusses the choice between “disposable diapers,” which “may take 300 years to decompose,” and cloth diapers, which “can be reused after washing, and decompose relatively easily.”⁷

Where Does It Go?

The truth is that there is no garbage crisis. And plastic isn’t really Public Enemy Number 1.

Municipal solid waste is the term used for waste produced by households. Modern societies like our own produce more waste than traditional societies, but throughout history all societies have had to deal with garbage. Some amount of waste is a natural by-product of living. The best we can do is figure out how to manage it with minimal harm to ourselves and the environment.

There are four principal approaches to disposing of solid waste: reducing the amount of waste, recycling or composting, incinerating, and putting it in landfills. Although textbooks discuss all of these, most children’s textbooks emphasize landfills, the major repositories of solid waste.

A landfill is a place where garbage is deposited and then covered up. There are two kinds of landfills for municipal garbage.

- ◆ Older landfills are essentially holes in the ground where garbage is placed and then covered with dirt. (Some are located in clay soils, because clay reduces leakage.)
- ◆ Newer landfills are also holes in the ground, but the hole is lined with plastic to prevent chemicals from leaking into groundwater, methane gas is vented, fluids are caught and purified, and garbage is covered daily with dirt.⁸ Modern landfills are a big improvement over most earlier models.

Most people don't really know much about landfills. But Dr. William Rathje does. He's an archaeologist at the University of Arizona who studies modern civilization the same way that archaeologists study ancient ones—by digging up waste sites. (He cheerily calls himself a “garbologist.”) Rathje has learned a lot of things. Some of these are surprises. For example, in his “digs” in the 1980s he learned that:

- ◆ Fast-food packaging of all kinds makes up less than 1 percent of the materials in landfills, whether measured by weight or volume.⁹
- ◆ Expanded polystyrene foam (Styrofoam) represents no more than 1 percent of the volume of garbage.¹⁰
- ◆ Disposable diapers represent only 1.4 percent of the volume.¹¹
- ◆ All plastic products account for less than 16 percent of landfill space, and this percentage hasn't gone up over the past 20 years.¹²
- ◆ Paper takes up well over 40 percent of landfill space. Newspapers alone average about 13 percent.¹³
- ◆ Rathje has found in his digging more than two thousand readable newspapers, some of them from as far back as 1952.¹⁴

A Landfill Crisis?

While there is no “garbage crisis,” in some places there is a shortage of landfills. New ones must be continually developed since most only last for about ten years. (Newer landfills tend to be much larger than older ones.)

The problem isn't space. Clark Wiseman of Gonzaga University points out that all the garbage produced by the United States for the next one thousand years could fit in a landfill forty-four miles (70.81 kilometres) square by 120 feet (36.57 metres) deep. That's right. One thousand years!¹⁵ This is only one-tenth of 1 percent of all the land area of the continental United States. And since Canada has one-tenth of the population of the United States, and a larger land mass, the problem of space is even less of an issue.

Rather, the problem is simply that people are not eager to have a landfill next door. The reason has more to do with the possible effect on property values than on risk to health. Landfills are no longer built in areas where the water table is shallow or the soil is permeable and thus the chemicals can leak out.

Even the old landfills rarely pose much risk. Once they have been shut down, they needn't remain wastelands. Consider Everett Crowley Park. It is a park in South Vancouver built on an old landfill near the Fraser River. Citizens who were concerned about their neighbourhood reclaimed the old dump, closed in 1967. They turned it into a scenic area where people go to picnic, walk, and enjoy the wildlife. The nature lovers who enjoy watching the coyotes hunt rabbits in the underbrush see no evidence of the park's former use.¹⁶

And some citizens and towns are willing to put up with having a landfill nearby—for a price. Private landfill operators can produce a package of incentives that benefit cities and individuals.

In 1991, the provincial government refused to allow the City of Toronto to sell its garbage to the community of Kirkland Lake, where it would have been safely dumped in an open-pit mine.¹⁷ But the

government of Charles City County, Virginia, allowed a regional landfill to be built in return for \$1.1 million per year. This fee allowed property taxes to be cut by 20 percent. Local residents were willing to allow a landfill in the area in exchange for lower property taxes.¹⁸

In fact, in 1995 the *Wall Street Journal* concluded that the supposed landfill crisis is a myth. “New capacity, it turns out, hasn’t been hard to come by because expanding old dumps isn’t terribly difficult,” wrote reporter Jeff Bailey. Siting new ones isn’t impossible, either. Conclusions such as this, however, have not deterred the Canadian Council of Ministers of the Environment from their 1988 goal of reducing the disposal of solid wastes in this country by 50 percent by the year 2000.¹⁹

Public Enemy No. 1?

As William Rathje discovered, *neither* plastic *nor* paper is likely to “biodegrade”, that is, break apart into its original “natural” components—in a typical landfill. The inertness of plastic is actually an advantage, since it won’t produce chemicals that can leak out. And when environmental impacts other than landfill space are considered, plastic may have some other advantages.

- ◆ A study published in *Science* magazine compared the manufacture of paper and polystyrene cups. Martin Hocking concluded that producing paper cups required more chemicals, more steam, more electricity, and more cooling water, and produced more air pollution and wastewater.
- ◆ Another study, this one by Franklin Associates, found that plastic bags can be produced for 20 to 40 percent less energy than paper bags, and produce less air and water pollution than do paper bags.²⁰

Although textbooks criticize polystyrene because it does not “biodegrade,” it gained its status as a “public enemy” because some foamed polystyrene products were formerly produced using CFCs (chlorofluorocarbons). These chemicals may be depleting the ozone layer, as discussed in Chapter 14, but polystyrene is no longer made with CFCs,²¹ although some substitutes (HCFCs) still may have a depleting effect. Rather than praise this development, many activists shifted to criticizing polystyrene because it fills up landfills.

Mountains of Waste

A major theme of environmental texts is that Canadians are wasteful. Discussions of solid waste elaborate on this theme.

- ◆ Textbooks typically state that Canadians produce about 400 kilograms of household garbage per person per year.²²
- ◆ The *Green Team* told a grade seven class that “the average Canadian produces about eighty cans of garbage a year . . . someone from the States, about sixty, someone from Africa, about five. So there’s some big differences there.”²³
- ◆ *Save the Earth: An Action Handbook for Kids* urges children to emulate students at Dartmouth College. They carried around a garbage bag for one week to put all the garbage they produced so they could see how much they personally created.²⁴

Figures on waste seem to be mostly guesswork. William Rathje says he has seen estimates ranging from 2.9 to 8 pounds per person per day (1.3 to 3.6 kilograms). His own studies suggest that in some parts of the United States households produce less than three pounds of garbage per day.²⁵

Statistics Canada estimates that individual Canadians produce less than 1 kilogram of garbage per day. Comparisons between countries can prove difficult, however, as waste is defined and measured differently between countries, and even between measuring agencies. Lynn Scarlett, a researcher for the Reason Foundation, estimates that American households produce 3.2 pounds of garbage per day (1.45 kilos). One reason American figures may be higher than Japanese or European figures is that recycled products such as aluminum cans, newspapers, and glass are included in American solid waste figures, while Japanese and European statistics include only items that actually go to the dump.²⁶

William Rathje actually measured garbage thrown out by households in the United States and Mexico (he wasn't digging into landfills in this experiment; he and his associates examined household garbage cans). He found that American households produce one-third less garbage than Mexican households.²⁷

Why? Modern packaging actually reduces waste, he explains. When vegetables are bought frozen in cardboard boxes, very little is wasted. In contrast, in Mexican households, vegetables are more often bought raw, so rinds, husks, leaves, stems, and other material must be removed and discarded.²⁸ (In North America, food processing companies often make animal feed and other products from these materials.)

Talking to Your Children

Thanks to the pioneering work of Rathje and others, we know more about the composition of solid waste than we used to. Our texts should teach that each product has its environmental benefits and its environmental costs. While glass bottles, for example, can be reused, juice boxes take up far less space, especially when they are crushed. Furthermore, our texts should teach the lesson that good solid waste

management can minimize the environmental harm caused by any product. Now you can answer your children's questions.

- ◆ Are we running out of landfill space?

No. While there may be a shortage of space in some places, it is likely to be temporary. The much-talked-about landfill shortage of the late 1980s has disappeared. Even though people don't want landfills "in their backyards," they may welcome them if the owners provide benefits such as lower property taxes.

- ◆ Does plastic hurt a landfill?

No. Since it is inert, plastic isn't going to produce chemicals in a landfill that could leak out. And while it does not "biodegrade" or decompose, the fact is that hardly anything decomposes in a landfill because there is not enough oxygen and water to cause biodegradation.

- ◆ Are Canadians too wasteful?

This is a question that each family should probably answer for itself. But claims that Canadians throw out far more than others are exaggerated.

Activities for Parents and Children

The following activities may help your children think more carefully about solid waste.

Orange Juice: Fresh or Frozen?

Packaging may not be as wasteful as your children think. With your children along, buy a can of frozen orange juice concentrate and some fresh oranges. Make the frozen orange juice according to the package instructions. Save all of the packaging from the frozen orange juice.

Now make the same amount of juice from fresh oranges. Save all the orange rinds as you make the juice.

Weigh the squeezed orange peels and compare them with the weight of the empty orange juice container (or just look at the space they take up). Ask your children which form of packaging produces more waste that will go into the landfill.

Eight-year-old Devin made twenty-four ounces of fresh orange juice, and had twenty-eight ounces of empty orange rinds when he was through. When he made the same amount of juice from concentrate, the only waste was the empty can, which weighed one ounce.

Once the juice has been fresh-squeezed, ask your children what happens to the skin and pulp. Of course, unless you have a compost pile, it is thrown away. Tell your children how commercial juice producers use the pulp and skin for animal feed, orange extracts, and flavoring oils. In light of that re-use, which method of delivering orange juice is less wasteful?

Make Your Own Landfill

Some books for children have an experiment that is supposed to show that some things, like food scraps, will decompose in a landfill and other things, like plastic, will not. These experiments are flawed because very little actually decomposes in a landfill. The essential elements for decomposition—air, high moisture levels, and microbes—are missing from most landfills. The following experiment more accurately reflects what happens in a landfill.

- ◆ Get a small plastic food container or glass jar with an airtight lid. Select small quantities of the following: newspaper, foam plastic cup, food scraps (orange or potato peel), and a plastic bag. Make a list of these items and their condition. Pack these items into the container as tightly as possible and pack it as full as possible. The objective is to leave as little air in the container as you can. Then wrap the container in aluminum foil so that no light can get in. Leave the container tightly sealed for four to six weeks. After

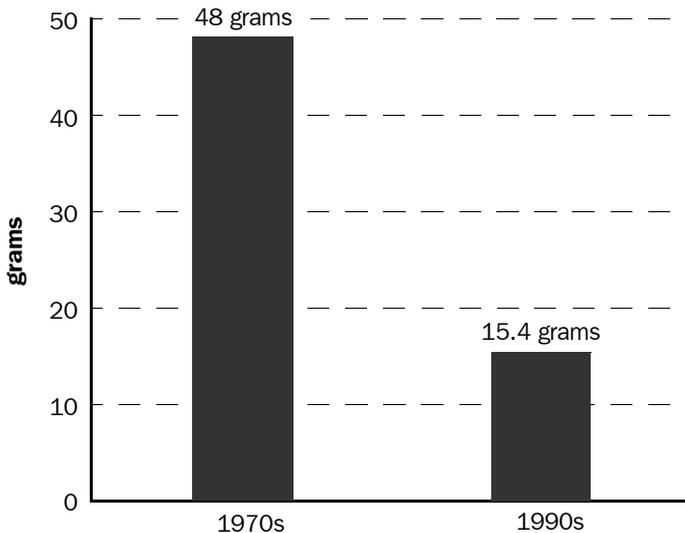
that time, open the container and examine each item. Can your children read the newspaper? Even items that are considered “biodegradable” rarely degrade under landfill conditions.

A Short History of the Soda Can

Most children do not understand or appreciate how competitive market forces often cause producers to reduce the amount of material they use in their packages. For example, plastic grocery bags were 70 percent thinner in 1989 than they were in 1976.²⁹ Here is another example, beverage cans.

In the 1960s, producers used steel to make beverage cans. They switched to lighter aluminum in the late 1960s and 1970s and since then have gradually reduced the amount of aluminum per can. Today, pop cans are extremely light. Show your children the graph below and discuss its implications.

Reduction in Weight of Beverage Cans, 1970s–1990s



Source: Canadian Soft Drink Association

Notes

- 1 Catherine Dee, ed., *Kid Heroes of the Environment* (Berkeley, CA: EarthWorks, 1991), 73–75.
- 2 Beth Savan, *Earthcycles and Ecosystems* (Toronto: Kids Can, 1991), 82.
- 3 Savan, 83.
- 4 Douglas A. Roberts, *Science Directions 9* (Edmonton: Arnold, 1991), 300.
- 5 Peter Beugger and Larry Yore, *Journeys in Science 5* (Toronto: Collier Macmillan, 1990), 57, 100.
- 6 Observation of the *Green Team* at Sir William Van Horne Elementary in Vancouver, BC, June 18, 1997.
- 7 Roberts, 148–149.
- 8 William Rathje and Cullen Murphy, *Rubbish! The Archaeology of Garbage* (New York: HarperCollins, 1992), 16.
- 9 Rathje and Murphy, 97.
- 10 Rathje and Murphy, 98.
- 11 Rathje and Murphy, 162.
- 12 Rathje and Murphy, 101.
- 13 Rathje and Murphy, 103, 104, 106.
- 14 Personal conversation with William Rathje, July 1996.
- 15 Lynn Scarlett, “A Consumer’s Guide to Environmental Myths and Realities,” Policy Report #99, National Center for Policy Analysis, Dallas, TX, September 1991, 3, quoting Clark Wiseman.
- 16 Judy Quan, *Everett Crowley Park: Paradise Reclaimed* (Vancouver: The Evergreen Foundation, 1997).
- 17 Patrick Luciani, *Economic Myths: Making Sense of Canadian Policy Issues* (Don Mills, ON: Addison-Wesley Publishers, 1996), 156.
- 18 Scarlett, 37.
- 19 National Roundtable on the Environment and the Economy, *The National Waste Reduction Handbook* (Ottawa: 1991), 6.

- 20 Scarlett, 14.
- 21 Letter from David Jolly, Environmental Affairs Representative, Dart Container Corporation, September 11, 1992.
- 22 Roberts, Vol. 9, 296.
- 23 Observation of the “Green Team” at William Van Horne Elementary School, Vancouver, BC, June 1997.
- 24 Betty Miles, *Save the Earth: An Action Handbook for Kids* (New York: Alfred A. Knopf, 1991), 13.
- 25 William L. Rathje, “Rubbish!” *Atlantic Monthly*, December 1989, 101.
- 26 Scarlett, 8.
- 27 Rathje and Murphy, 217.
- 28 Rathje and Murphy, 217.
- 29 Scarlett, 32.