From Rubbish!
by W. Rathje + C. Murphy
1992.

CHAPTER 1

YES, WONDERFUL THINGS

On a crisp October morning not long ago the sun ascended above the Atlantic Ocean and turned its gaze on a team of young researchers as they swarmed over what may be the largest archaeological site in the world. The mound they occupied covers three thousand acres and in places rises more than 155 feet above a low-lying island. Its mass, estimated at 100 million tons, and its volume, estimated at 2.9 billion cubic feet, make it one of the largest man-made structures in North America. And it is known to be a treasure trove—a Pompeii, a Tikal, a Valley of the Kings—of artifacts from the most advanced civilization the planet has ever seen. Overhead sea gulls cackled and cawed, alighting now and then to peck at an artifact or skeptically observe an archaeologist at work. The surrounding landscape still supported quail and duck, but far more noticeable were the dusty, rumbling wagons and tractors of the New York City Department of Sanitation.

The site was the Fresh Kills landfill, on Staten Island, in New York City, a repository of garbage that, when shut down, in the year 2005, will have reached a height of 505 feet above sea level, making it the

highest geographic feature along a fifteen-hundred-mile stretch of the Atlantic seaboard running north from Florida all the way to Maine. One sometimes hears that Fresh Kills will have to be closed when it reaches 505 feet so as not to interfere with the approach of aircraft to Newark Airport, in New Jersey, which lies just across the waterway called Arthur Kill. In reality, though, the 505-foot elevation is the result of a series of calculations designed to maximize the landfill's size while avoiding the creation of grades so steep that roads built upon the landfill can't safely be used.

Fresh Kills was originally a vast marshland, a tidal swamp. Robert Moses's plan for the area, in 1948, was to dump enough garbage there to fill the marshland up—a process that would take, according to one estimate, until 1968—and then to develop the site, building houses, attracting light industry, and setting aside open space for recreational use. ("The Fresh Kills landfill project," a 1951 report to Mayor Vincent R. Impelliteri observed, "cannot fail to affect constructively a wide area around it. It is at once practical and idealistic.") Something along these lines may yet happen when Fresh Kills is closed. Until then, however, it is the largest active landfill in the world. It is twenty-five times the size of the Great Pyramid of Khufu at Giza, forty times the size of the Temple of the Sun at Teotihuacan (see Figure 1-A). The volume of Fresh Kills is approaching that of the Great Wall of China, and by one estimate will surpass it at some point in the next few years. It is the sheer physical stature of Fresh Kills in the hulking world of landfills that explains why archaeologists were drawn to the place.

To the archaeologists of the University of Arizona's Garbage Project, which is now entering its twentieth year, landfills represent valuable lodes of information that may, when mined and interpreted, produce valuable insights—insights not into the nature of some past society, of course, but into the nature of our own. Garbage is among humanity's most prodigious physical legacies to those who have yet to be born; if we can come to understand our discards, Garbage Project archaeologists argue, then we will better understand the world in which we live. It is this conviction that prompts Garbage Project researchers to look upon the steaming detritus of daily existence with the same quiet excitement displayed by Howard Carter

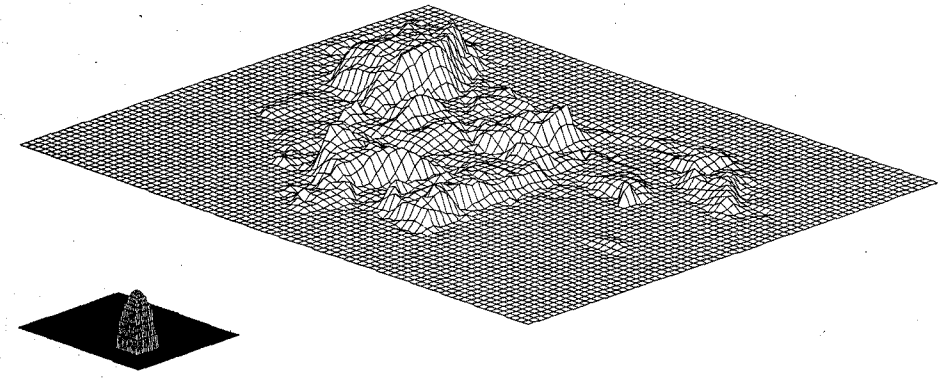

Figure 1-A. A comparison of the Pyramid of the Sun at Teotihuacan, in Mexico (left) and the Fresh Kills landfill, on Staten Island, in New York (right). The Pyramid of the Sun is roughly 800 feet to a side; the Fresh Kills grid as a whole represents an area roughly 2.8 miles by 3.8 miles. Elevations have been exaggerated for clarity, but the relative volumes represented are accurate.

SOURCE: Masakazu Tani, The Garbage Project

and Lord George Edward Carnarvon at the unpillaged, unopened tomb of Tutankhamun.

"Can you see anything?" Carnarvon asked as Carter thrust a lighted candle through a hole into the gloom of the first antechamber. "Yes," Carter replied. "Wonderful things."

Garbage archaeology can be conducted in several ways. At Fresh Kills the method of excavation involved a mobile derrick and a thirteen-hundred-pound bucket auger, the latter of which would be sunk into various parts of the landfill to retrieve samples of garbage from selected strata. At 6:15 a.m. Buddy Kellett of the company Kellett's Well Boring, Inc., which had assisted with several previous Garbage Project landfill digs, drove one of the company's trucks, with derrick and auger collapsed for travel, straight up the steep slope of one of the landfill mounds. Two-thirds of the way up, the Garbage Project crew directed Kellett to a small patch of level ground. Four hydraulic posts were deployed from the stationary vehicle, extending outward to keep it safely moored. Now the derrick was raised. It supported a

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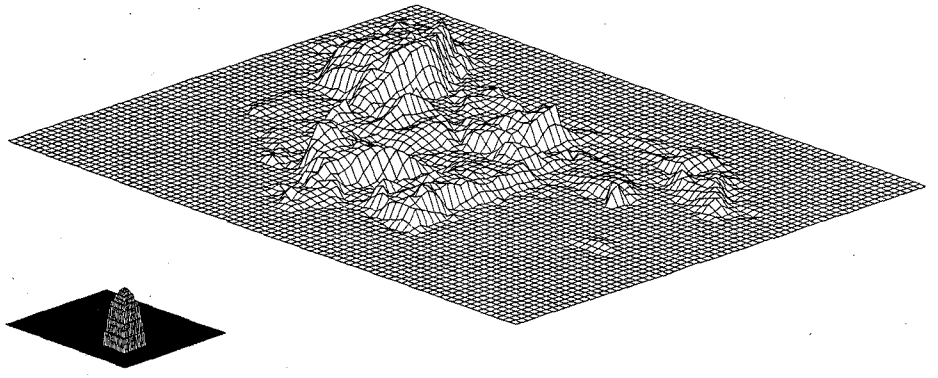

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long metal rod that in turn housed two other metal rods; the apparatus, when pulled to its full length, like a telescope, was capable of penetrating the landfill to a depth of ninety-seven feet—enough at this particular spot to go clear through its bottom and into the original marsh that Fresh Kills had been (or into what was left of it). At the end of the rods was the auger, a large bucket made of high-tension steel: four feet high, three feet in diameter, and open at the bottom like a cookie cutter, with six graphite-and-steel teeth around the bottom's circumference. The bucket would spin at about thirty revolutions per minute and with such force that virtually nothing could impede its descent. At a Garbage Project excavation in Sunnyvale, California, in 1988, one of the first things the bucket hit in the cover dirt a few feet below the surface of the Sunnyvale Landfill was the skeleton of a car. The bucket's teeth snapped the axle, and drilled on.

The digging at Fresh Kills began. Down the whirring bucket plunged. Moments later it returned with a gasp, laden with garbage that, when released, spewed a thin vapor into the chill autumnal air. The smell was pungent, somewhere between sweet and disagreeable. Kellett's rig operator, David Spillers, did his job with the relaxation that comes of familiarity, seemingly oblivious to the harsh grindings and sharp clanks. The rest of the archaeological crew, wearing cloth aprons and heavy rubber gloves, went about their duties with practiced efficiency and considerable speed. They were veteran members of the Garbage Project's A-Team—its landfill-excavating arm—and had been through it all before.

Again a bucketful of garbage rose out of the ground. As soon as it was dumped Masakazu Tani, at the time a Japanese graduate student in anthropology at the University of Arizona (his Ph.D. thesis, recently completed, involves identifying activity areas in ancient sites on the basis of distributions of litter), plunged a thermometer into the warm mass. "Forty-three degrees centigrade," Tani called out. The temperature (equivalent to 109.4 degrees Fahrenheit) was duly logged. The garbage was then given a brusque preliminary examination to determine its generic source and, if possible, its date of origin. In this case the presence of telltale domestic items, and of legible newspapers, made both tasks easy. Gavin Archer, another anthropologist and a research associate of the Garbage Project, made

a notation in the running log that he would keep all day long: "Household, circa 1977." Before the next sample was pulled up Douglas Wilson, an anthropologist who specializes in household hazardous waste, stepped up to the auger hole and played out a weighted tape measure, eventually calling out, "Thirty-five feet." As a safety precaution, Wilson, like any other crew member working close to the sunken shaft on depth-measure duty, wore a leather harness tethered to a nearby vehicle. The esophagus created by the bucket auger was just large enough to accept a human being, and anyone slipping untethered a story or two into this narrow, oxygen-starved cavity would die of asphyxiation before any rescue could be attempted.

Most of the bucketfuls of garbage received no more attention than did the load labeled "Household, circa 1977." Some basic data were recorded for tracking purposes, and the garbage was left on a quickly accumulating backdirt pile. But as each of what would finally be fourteen wells grew deeper and deeper, at regular intervals (either every five or every ten feet) samples were taken and preserved for full-dress analysis. On those occasions Wilson Hughes, the methodical and serenely ursine co-director and field supervisor of the Garbage Project, and the man responsible for day-to-day logistics at the Fresh Kills dig, would call out to the bucket operator over the noise of the engine: "We'll take the next bucket." Then Hughes and Wilson would race toward the rig in a running crouch, like medics toward a helicopter, a plywood sampling board between them. Running in behind came a team of microbiologists and civil engineers assembled from the University of Oklahoma, the University of Wisconsin, and Procter & Gamble's environmental laboratory. They brought with them a variety of containers and sealing devices to preserve samples in an oxygen-free environment—an environment that would allow colonies of the anaerobic bacteria that cause most of the biodegradation in landfills (to the extent that biodegradation occurs) to survive for later analysis. Behind the biologists and engineers came other Garbage Project personnel with an assortment of wire mesh screens and saw horses.

Within seconds of the bucket's removal from the ground, the operator maneuvered it directly over the sampling board, and released the contents. The pile was attacked first by Phillip Zack, a civil

engineering student from the University of Wisconsin, who, as the temperature was being recorded, directed portions of the material into a variety of airtight conveyances. Then other members of the team moved in—the people who would shovel the steaming refuse atop the wire mesh; the people who would sort and bag whatever didn't go through the mesh; the people who would pour into bags or cannisters or jars whatever did go through the mesh; the people who would label everything for the trip either back to Tucson and the Garbage Project's holding bins or to the laboratories of the various microbiologists. (The shortest trip was to the trailer-laboratory that Procter & Gamble scientists had driven from Cincinnati and parked at the edge of the landfill.) The whole sample-collection process, from dumping to sorting to storing, took no more than twelve minutes. During the Fresh Kills dig it was repeated forty-four times at various places and various depths.

As morning edged toward afternoon the bucket auger began to near the limits of its reach in one of the wells. Down through the first thirty-five feet, a depth that in this well would date back to around 1984, the landfill had been relatively dry. Food waste and yard waste—hot dogs, bread, and grass clippings, for example—were fairly well preserved. Newspapers remained intact and easy to read, their lurid headlines ("Woman Butchered—Ex-Hubby Held") calling to mind a handful of yesterday's tragedies. Beyond thirty-five feet, however, the landfill became increasingly wet, the garbage increasingly unidentifiable. At sixty feet, a stratum in this well containing garbage from the 1940s and 1950s, the bucket grabbed a sample and pulled it toward the surface. The Garbage Project team ran forward with their equipment, positioning themselves underneath. The bucket rose majestically as the operator sat at the controls, shouting something over the noise. As near as anyone can reconstruct it now, he was saying, "You boys might want to back off some, 'cause if this wind hits that bucket. . . ." The operator broke off because the wind did hit that bucket, and the material inside—a gray slime, redolent of putrefaction—thoroughly showered the crew. It would be an exaggeration to suggest that the victims were elated by this development, but their curiosity was certainly piqued, because on only one previous excavation had slime like this turned up in a landfill. What was the stuff made of? How had it come to be?

What did its existence mean? The crew members doggedly collected all the usual samples, plus a few extras bottles of slime for special study. Then they cleaned themselves off.

It would be a blessing if it were possible to study garbage in the abstract, to study garbage without having to handle it physically.* But that is not possible. Garbage is not mathematics. To understand garbage you have to touch it, to feel it, to sort it, to smell it. You have to pick through hundreds of tons of it, counting and weighing all the daily newspapers, the telephone books, the soiled diapers, the foam clamshells that once briefly held hamburgers, the lipstick cylinders coated with grease, the medicine vials still encasing brightly colored pills, the empty bottles of scotch, the half-full cans of paint and muddy turpentine, the forsaken toys, the cigarette butts. You have to sort and weigh and measure the volume of all the organic matter, the discards from thousands of plates: the noodles and the Cheerios and the tortillas; the pieces of pet food that have made their own gravy; the hardened jelly doughnuts, bleeding from their side wounds; the half-eaten bananas, mostly still within their peels, black and incomparably sweet in the embrace of final decay. You have to confront sticky green mountains of yard waste, and slippery brown hills of potato peels, and brittle ossuaries of chicken bones and T-bones. And then, finally, there are the "fines," the vast connecting mixture of tiny bits of paper, metal, glass, plastic, dirt, grit, and former nutrients that suffuses every landfill like a kind of grainy

* A note on terminology. Several words for the things we throw away—"garbage," "trash," "refuse," "rubbish"—are used synonymously in casual speech but in fact have different meanings. *Trash* refers specifically to discards that are at least theoretically "dry"—newspapers, boxes, cans, and so on. *Garbage* refers technically to "wet" discards—food remains, yard waste, and offal. *Refuse* is an inclusive term for both the wet discards and the dry. *Rubbish* is even more inclusive: It refers to all refuse plus construction and demolition debris. The distinction between wet and dry garbage was important in the days when cities slopped garbage to pigs, and needed to have the wet material separated from the dry; it eventually became irrevelant, but may see a revival if the idea of composting food and yard waste catches on. We will frequently use "garbage" in this book to refer to the totality of human discards because it is the word used most naturally in ordinary speech. The word is etymologically obscure, though it probably derives from Anglo-French, and its earliest associations have to do with working in the kitchen.

lymph. To understand garbage you need thick gloves and a mask and some booster shots. But the yield in knowledge—about people and their behavior as well as about garbage itself—offsets the grim working conditions.

To an archaeologist, ancient garbage pits or garbage mounds, which can usually be located within a short distance from any ruin, are always among the happiest of finds, for they contain in concentrated form the artifacts and comestibles and remnants of behavior of the people who used them. While every archaeologist dreams of discovering spectacular objects, the bread-and-butter work of archaeology involves the most common and routine kinds of discards. It is not entirely fanciful to define archaeology as the discipline that tries to understand old garbage, and to learn from that garbage something about ancient societies and ancient behaviors. The eminent archaeologist Emil Haury once wrote of the aboriginal garbage heaps of the American Southwest: "Whichever way one views the mounds—as garbage piles to avoid, or as symbols of a way of life—they nevertheless are features more productive of information than any others." When the British archaeologist Sir Leonard Woolley, in 1916, first climbed to the top of the ancient city of Carchemish, on the Euphrates River near the modern-day Turkish-Syrian border, he moistened his index finger and held it in the air. Satisfied, he scanned the region due south of the city—that is, downwind—pausing to draw on his map the location of any mounds he saw. A trench dug through the largest of these mounds revealed it to be the garbage dump Woolley was certain it was, and the exposed strata helped establish the chronological sequence for the Carchemish site as a whole. Archaeologists have been picking through ancient garbage ever since archaeology became a profession, more than a century ago, and they will no doubt go on doing so as long as garbage is produced.

Several basic points about garbage need to be emphasized at the outset. First, the creation of garbage is an unequivocal sign of a human presence. From Styrofoam cups along a roadway and urine bags on the moon there is an uninterrupted chain of garbage that reaches back more than two million years to the first "waste flake" knocked off in the knapping of the first stone tool. That the distant past often seems misty and dim is precisely because our earliest

ancestors left so little garbage behind. An appreciation of the accomplishments of the first hominids became possible only after they began making stone tools, the debris from the production of which, along with the discarded tools themselves, are now probed for their secrets with electron microscopes and displayed in museums not as garbage but as "artifacts." These artifacts serve as markers—increasingly frequent and informative markers—of how our forebears coped with the evolving physical and social world. Human beings are mere place-holders in time, like zeros in a long number; their garbage seems to have more staying power, and a power to inform across the millennia that complements (and often substitutes for) that of the written word. The profligate habits of our own country and our own time—the sheer volume of the garbage that we create and must dispose of—will make our society an open book. The question is: Would we ourselves recognize our story when it is told, or will our garbage tell tales about us that we as yet do not suspect?

That brings up a second matter: If our garbage, in the eyes of the future, is destined to hold a key to the past, then surely it already holds a key to the present. This may be an obvious point, but it is one whose implications were not pursued by scholars until relatively recently. Each of us throws away dozens of items every day. All of these items are relics of specific human activities—relics no different in their inherent nature from many of those that traditional archaeologists work with (though they are, to be sure, a bit fresher). Taken as a whole the garbage of the United States, from its 93 million households and 1.5 million retail outlets and from all of its schools, hospitals, government offices, and other public facilities, is a mirror of American society. Of course, the problem with the mirror garbage offers is that, when encountered in a garbage can, dump, or landfill, it is a broken one: our civilization is reflected in billions of fragments that may reveal little in and of themselves. Fitting some of the pieces back together requires painstaking effort—effort that a small number of archaeologists and natural scientists have only just begun to apply.

A third point about garbage is that it is not an assertion but a physical fact—and thus may sometimes serve as a useful corrective. Human beings have over the centuries left many accounts describing

their lives and civilizations. Many of these are little more than self-aggrandizing advertisements. The remains of the tombs, temples, and palaces of the elite are filled with personal histories as recorded by admiring relatives and fawning retainers. More such information is carved into obelisks and stelae, gouged into clay tablets, painted or printed on papyrus and paper. Historians are understandably drawn to written evidence of this kind, but garbage has often served as a kind of tattle-tale, setting the record straight.

It had long been known, for example, that French as well as Spanish forts had been erected along the coast of South Carolina during the sixteenth century, and various mounds and depressions have survived into our own time to testify to their whereabouts. Ever since the mid-nineteenth century a site on the tip of Parris Island, South Carolina, has been familiarly known as the site of a French outpost, built in 1562, that is spelled variously in old documents as Charlesfort, Charlesforte, and Charles Forte. In 1925, the Huguenot Society of South Carolina successfully lobbied Congress to erect a monument commemorating the building of Charlesfort. Subsequently, people in nearby Beaufort took up the Charlesfort theme, giving French names to streets, restaurants, and housing developments. Gift shops sold kitschy touristiana with a distinctly Gallic flavor. Those restaurants and gift shops found themselves in an awkward position when, in 1957, as a result of an analysis of discarded matter discovered at Charlesfort, a National Park Service historian, Albert Manucy, suggested that the site was of Spanish origin. Excavations begun in 1979 by the archaeologist Stanley South, which turned up such items as discarded Spanish olive jars and broken majolica pottery from Seville, confirmed Manucy's view: "Charlesfort," South established, was actually Fort San Marcos, a Spanish installation built in 1577 to protect a Spanish town named Santa Elena. (Both the fort and the town had been abandoned after only a few years.)

Garbage, then, represents physical fact, not mythology. It underscores a point that can not be too greatly emphasized: Our private worlds consist essentially of two realities—mental reality, which encompasses beliefs, attitudes, and ideas, and material reality, which is the picture embodied in the physical record. The study of garbage reminds us that it is a rare person in whom mental and material realities completely coincide. Indeed, for the most part, the pair exist in a state of tension, if not open conflict.

Americans have always wondered, sometimes with buoyant playfulness, what their countrymen in the far future will make of Americans "now." In 1952, in a monograph he first circulated privately among colleagues and eventually published in *The Journal of Irreproducible Results,* the eminent anthropologist and linguist Joseph H. Greenberg—the man who would one day sort the roughly one thousand known Native American languages into three broad language families—imagined the unearthing of the so-called "violence texts" during an excavation of the Brooklyn Dodgers' Ebbets Field in the year A.D. 2026; what interpretation, he wondered, would be given to such newspaper reports as "Yanks Slaughter Indians" and "Reese made a sacrifice in the infield"? In 1979 the artist and writer David Macaulay published *Motel of the Mysteries,* an archaeological site-report setting forth the conclusions reached by a team of excavators in the year A.D. 4022 who have unearthed a motel dating back to 1985 (the year, Macaulay wrote, in which "an accidental reduction in postal rates on a substance called third- and fourth-class mail literally buried the North Americans under tons of brochures, fliers, and small containers called FREE"). Included in the report are illustrations of an archaeologist modeling a toilet seat, toothbrushes, and a drain stopper (or, as Macaulay describes them, "the Sacred Collar . . . the magnificent 'plasticus' ear ornaments, and the exquisite silver chain and pendant"), all assumed to be items of ritual or personal regalia. In 1982 an exhibit was mounted in New York City called "Splendors of the Sohites"—a vast display of artifacts, including "funerary vessels" (faded, dusky soda bottles) and "hermaphrodite amulets" (discarded pop-top rings), found in the SoHo section of Manhattan and dating from the Archaic Period (A.D. 1950–1961), the Classical Period (1962–1975), and the Decadent Period (1976–c.1980).

Greenberg, Macaulay, and the organizers of the Sohites exhibition all meant to have some fun, but there is an uneasy undercurrent to their work, and it is embodied in the question: What are we to make of ourselves? The Garbage Project, conceived in 1971, and officially

established at the University of Arizona in 1973, was an attempt to come up with a new way of providing serious answers. It aimed to apply *real* archaeology to this very question; to see if it would be possible to investigate human behavior "from the back end," as it were. This scholarly endeavor has come to be known as garbology, and practitioners of garbology are known as garbologists. The printed citation (dated 1975) in the *Oxford English Dictionary* for the meaning of "garbology" as used here associates the term with the Garbage Project.

In the years since its founding the Garbage Project's staff members have processed more than 250,000 pounds of garbage, some of it from landfills but most of it fresh out of garbage cans in selected neighborhoods (see Figure 1-B). All of this garbage has been sorted, coded, and catalogued—every piece, from bottles of furniture polish and egg-shaped pantyhose packaging to worn and shredded clothing, crumpled bubble-gum wrappers, and the full range of kitchen waste. A unique database has been built up from these cast-offs, covering virtually every aspect of American life: drinking habits, attitudes toward red meat, trends in the use of convenience foods, the strange ways in which consumers respond to shortages, the use of contraceptives, and hundreds of other matters.*

The antecedents of the Garbage Project in the world of scholarship and elsewhere are few but various. Some are undeniably dubious. The examination of fresh refuse is, of course, as old as the human species—just watch anyone who happens upon an old campsite, or a neighbor scavenging at a dump for spare parts or furniture. The

* A question that always comes up is: What about garbage disposers? Garbage disposers are obviously capable of skewing the data in certain garbage categories, and Garbage Project researchers can employ a variety of techniques to compensate for the bias that garbage disposers introduce. Studies were conducted at the very outset of the Garbage Project to determine the discard differential between households with and without disposers, and one eventual result was a set of correction factors for various kinds of garbage (primarily food), broken down by subtype. As a general rule of thumb, households with disposers end up discarding in their trash about half the amount of food waste and food debris as households without disposers. It should be noted, however, that the fact that disposers have ground up some portion of a household's garbage often has little relevance to the larger issues the Garbage Project is trying to address. It means, for example, not that the Garbage Project's findings about the extent of food waste (see chapter three) are invalid, but merely that its estimates are conservative.

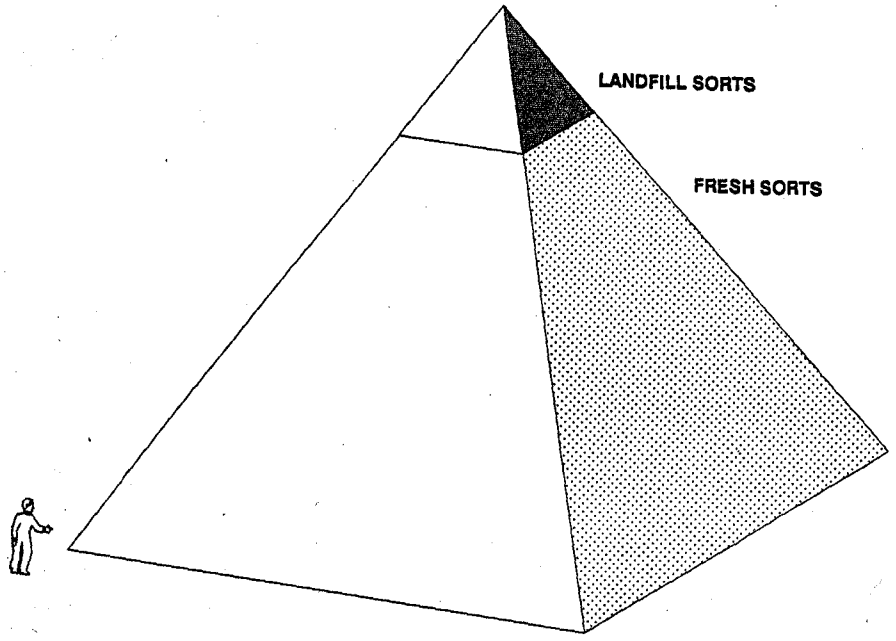

Figure 1-B. As of mid-1991, the volume of garbage that had been sorted by Garbage Project researchers was equivalent to 1,766 cubic yards—enough to create a pyramid 56 feet square and 45 feet high. The smaller pyramid at the pinnacle shows the percent of the total sorted garbage that had been obtained from landfills, as opposed to garbage fresh from the truck.

SOURCE: Douglas Wilson, The Garbage Project

first systematic study of the components of America's garbage dates to the early 1900s and the work of the civil engineers Rudolph Hering (in New York) and Samuel A. Greeley (in Chicago), who by 1921 had gathered enough information from enough cities to compile *Collection and Disposal of Municipal Refuse,* the first textbook on urban trash management. In academe, not much happened after that for quite some time. Out in the field, however, civil engineers and solid-waste managers did now and again sort and weigh fresh garbage as it stood in transit between its source and destination, but their categories were usually simple: paper, glass, metal. No one sorted garbage into detailed categories relating to particular consumer discard patterns. No one, for example, kept track of phenom-

ena as specific as the number of beer cans thrown away versus the number of beer bottles, or the number of orange-juice cans thrown away versus the number of pounds of freshly squeezed oranges, or the amount of candy thrown away in the week after Halloween versus the amount thrown away in the week after Valentine's Day. And no one ever dug into the final resting places of most of America's garbage: dumps (where garbage is left in the open) and sanitary landfills (where fresh garbage is covered every night with six to eight inches of soil).

Even as America's city managers over the years oversaw—and sometimes desperately attempted to cope with—the disposal of ever-increasing amounts of garbage, the study of garbage itself took several odd detours—one into the world of the military, another into the world of celebrity-watching, and a third into the world of law enforcement.

The military's foray into garbology occurred in 1941, when two enlisted men, Horace Schwerin and Phalen Golden, were forced to discontinue a survey they were conducting among new recruits about which aspects of Army life the recruits most disliked. (Conducting polls of military personnel was, they had learned, against regulations.) Schwerin and Golden had already discovered, however, that the low quality of the food was the most frequently heard complaint, and they resolved to look into this one matter with an investigation that could not be considered a poll. What Schwerin and Golden did was to station observers in mess halls to record the types of food that were most commonly wasted and the volume of waste by type of food. The result, after 2.4 million man-meals had been observed, was a textbook example of how garbage studies can produce not only behavioral insights but also practical benefits. Schwerin and Golden discovered that 20 percent of the food prepared for Army mess halls was eventually thrown away, and that one reason for this was simply excess preparation. Here are some more of their findings, as summarized in a wartime article that appeared in the *The Saturday Evening Post:*

> Soldiers ate more if they were allowed to smoke in the mess hall. They ate more if they went promptly to table instead of waiting on line outside—perhaps because the food became cold. They ate more if they fell to on their own initiative instead of by command. They cared little for soups, and 65 percent of the kale and nearly as much of the spinach went into the garbage can. Favorite desserts were cakes and cookies, canned fruit, fruit salad, and gelatin. They ate ice cream in almost any amount that was served to them.

"That, sergeant, is an excellent piece of work," General George C. Marshall, the Army chief of staff, told Horace Schwerin after hearing a report by Schwerin on the research findings. The Army adopted many of Schwerin and Golden's recommendations, and began saving some 2.5 million pounds of food a day. It is perhaps not surprising to learn that until joining the Army Horace Schwerin had been in market research, and, among other things, had helped CBS to perfect a device for measuring audience reaction to radio shows.

The origins of an ephemeral branch of garbage studies focused on celebrities—"peeping-Tom" garbology, one might call it—seem to lie in the work of A. J. Weberman. Weberman was a gonzo journalist and yippie whose interest in the songs of Bob Dylan, and obsession with their interpretation, in 1970 prompted him to begin stealing the garbage from the cans left out in front of Dylan's Greenwich Village brownstone on MacDougal Street. Weberman didn't find much—some soiled Pampers, some old newspapers, some fast-food packaging from a nearby Blimpie Base, a shopping list with the word vanilla spelled "vannilla." He did, however, stumble into a brief but highly publicized career. This self-proclaimed "garbage guerrilla" quickly moved on to Neil Simon's garbage (it included a half-eaten bagel, scraps of lox, the Sunday *Times),* Muhammad Ali's (an empty can of Luck's collard greens, an empty roach bomb), and Abbie Hoffman's (a summons for hitchhiking, an unused can of deodorant, an estimate of the cost for the printing of *Steal This Book,* and the telephone numbers of Jack Anderson and Kate Millet). Weberman revealed many of his findings in an article in *Esquire* in 1971. It was antics such as his that inspired a prior meaning of the term "garbology," one very different from the definition established today.

Weberman's work inspired other garbage guerrillas. In January of 1975, the *Detroit Free Press* Sunday magazine reported on the findings from its raids on the garbage of several city notables, including

the mayor, the head of the city council, the leader of a right-wing group, a food columnist, a disk jockey, and a prominent psychiatrist. Nothing much was discovered that might be deemed out of the ordinary, save for some of the contents of the garbage taken from a local Hare Krishna temple: a price tag from an Oleg Cassini garment, for example, and four ticket stubs from the Bel-Aire Drive-In Theater, which at the time was showing *Horrible House on the Hill* and *The Night God Screamed*. Six months after the *Free Press* exposé, a reporter for the *National Enquirer*, Jay Gourley, drove up to 3018 Dumbarton Avenue, N.W., in Washington, D.C., and threw the five garbage bags in front of Secretary of State Henry A. Kissinger's house into the trunk of his car. Secret Service agents swiftly blocked Gourley's departure, but after a day of questioning allowed him to proceed, the garbage still in the trunk. Among Gourley's finds: a crumpled piece of paper with a dog's teeth marks on it, upon which was written the work schedules of the Secret Service agents assigned to guard the Secretary; empty bottles of Seconal and Maalox; and a shopping list, calling for a case of Jack Daniel's, a case of Ezra Brooks bourbon, and a case of Cabin Still bourbon. Gourley later returned most of the garbage to the Kissingers—minus, he told reporters, "several dozen interesting things."

After the Kissinger episode curiosity about the garbage of celebrities seems to have abated. In 1977 the *National Enquirer* sent a reporter to poke through the garbage of President Jimmy Carter's press secretary, Jody Powell. The reporter found so little of interest that the tabloid decided not to publish a story. In 1980 Secret Service agents apprehended A. J. Weberman as he attempted to abduct former President Richard Nixon's garbage from behind an apartment building in Manhattan. Weberman was released, without the garbage.

The third detour taken by garbage studies involves police work. Over the years, law enforcement agents looking for evidence in criminal cases have also been more-than-occasional students of garbage; the Federal Bureau of Investigation in particular has spent considerable time poring over the household trash of people in whom it maintains a professional interest. ("We take it on a case-by-case basis," an FBI spokesman says.) One of the biggest criminal cases involving garbage began in 1975 and involved Joseph "Joe Bananas"

Bonanno, Sr., a resident of Tucson at the time and a man with alleged ties to organized crime that were believed to date back to the days of Al Capone. For a period of three years officers of the Arizona Drug Control District collected Bonanno's trash just before the regular pickup, replacing it with "fake" Bonanno garbage. (Local garbagemen were not employed in the operation because some of them had received anonymous threats after assisting law enforcement agencies in an earlier venture.) The haul in evidence was beyond anyone's expectations: Bonanno had apparently kept detailed records of his various transactions, mostly in Sicilian. Although Bonanno had torn up each sheet of paper into tiny pieces, forensic specialists with the Drug Control District, like archaeologists reconstructing ceramic bowls from potsherds, managed to reassemble many of the documents and with the help of the FBI got them translated. In 1980 Bonanno was found guilty of having interfered with a federal grand jury investigation into the business operations of his two sons and a nephew. He was eventually sent to jail.

Unlike law-enforcement officers or garbage guerrillas, the archaeologists of the Garbage Project are not interested in the contents of any particular individual's garbage can. Indeed, it is almost always the case that a given person's garbage is at once largely anonymous and unimaginably humdrum. Garbage most usefully comes alive when it can be viewed in the context of broad patterns, for it is mainly in patterns that the links between artifacts and behaviors can be discerned.

The seed from which the Garbage Project grew was an anthropology class conducted at the University of Arizona in 1971 that was designed to teach principles of archaeological methodology. The University of Arizona has long occupied a venerable place in the annals of American archaeology and, not surprisingly, the pursuit of archaeology there to this day is carried on in serious and innovative ways. The class in question was one in which students undertook independent projects aimed precisely at showing links between various kinds of artifacts and various kinds of behavior. For example, one student, Sharon Thomas, decided to look into the relationship between a familiar motor function ("the diffusion pattern of ketchup

over hamburgers") and a person's appearance, as manifested in clothing. Thomas took up a position at "seven different hamburger dispensaries" and, as people came in to eat, labeled them "neat" or "sloppy" according to a set of criteria relating to the way they dressed. Then she recorded how each of the fifty-seven patrons she studied—the ones who ordered hamburgers—poured ketchup over their food. She discovered that sloppy people were far more likely than neat people to put ketchup on in blobs, sometimes even stirring it with their fingers. Neat people, in contrast, tended to apply the ketchup in patterns: circles, spirals, and crisscrosses. One person (a young male neatly dressed in a body shirt, flared pants, and patent-leather Oxfords) wrote with ketchup what appeared to be initials.

Two of the student investigations, conducted independently by Frank Ariza and Kelly Allen, led directly to the Garbage Project. Ariza and Allen, wanting to explore the divergence between (or correlation of) mental stereotypes and physical realities, collected garbage from two households in an affluent part of Tucson and compared it to garbage from two households in a poor and, as it happens, Mexican-American part of town. The rich and poor families, each student found, ate about the same amount of steak and hamburger, and drank about the same amount of milk. But the poor families, they learned, bought more expensive child-education items. They also bought more household cleansers. What did such findings mean? Obviously the sample—involving only four households in all—was too small for the results even to be acknowledged as representative, let alone to provide hints as to what lay behind them. However, the general nature of the research effort itself—comparing garbage samples in order to gauge behavior (and, what is more, gauging behavior unobtrusively, thereby avoiding one of the great biases inherent in much social science)—seemed to hold great promise.

A year later, in 1972, university students, under professorial direction, began borrowing samples of household garbage from different areas of Tucson, and sorting it in a lot behind a dormitory. The Garbage Project was under way. In 1973, the Garbage Project entered into an arrangement with the City of Tucson, whereby the Sanitation Division, four days a week, delivered five to eight randomly selected household pickups from designated census tracts to

an analysis site that the Division set aside for the Project's sorters at a maintenance yard. (Wilson Hughes, who as mentioned earlier is the Garbage Project's co-director, was one of the first undergraduate garbage sorters.) In 1984 operations were moved to an enclosure where many of the university's dumpsters are parked, across the street from Arizona Stadium.

The excavation of landfills would come much later in the Garbage Project's history, when to its focus on issues of garbage and human behavior it added a focus on issues of garbage management. The advantage in the initial years of sorting fresh garbage over excavating landfills was a basic but important one: In landfills it is often quite difficult and in many cases impossible to get some idea, demographically speaking, of the kind of neighborhood from which any particular piece of garbage has come. The value of landfill studies is therefore limited to advancing our understanding of garbage in the aggregate. With fresh garbage, on the other hand, one can have demographic precision down to the level of a few city blocks, by directing pickups to specific census districts and cross-tabulating the findings with census data.

Needless to say, deciding just which characteristics of the collected garbage to pay attention to posed a conceptual challenge, one that was met by Wilson Hughes, who devised the "protocol" that is used by the Garbage Project to this day. Items found in garbage are sorted into one of 150 specific coded categories (see Figure 1-C) that can in turn be clustered into larger categories representing food (fresh food versus prepared, health food versus junk food), drugs, personal and household sanitation products, amusement-related or educational materials, communications-related materials, pet-related materials, yard-related materials, and hazardous materials. For each item the following information is recorded on a standardized form: the date on which it was collected; the census tract from which it came; the item code (for example, 001, which would be the code for "Beef"); the item's type (for example, "chuck"); its original weight or volume (in this case, derived from the packaging); its cost (also from the packaging); material composition of container; brand (if applicable); and the weight of any discarded food (if applicable). The information garnered over the years from many thousands of such forms, filled out in pursuit of a wide variety of research objectives, consti-

GARBAGE ITEM CODE LIST

The Garbage Project
University of Arizona

BEEF* 001
OTHER MEAT (not bacon)* 002
CHICKEN 003
OTHER POULTRY 004
FISH
(fresh, frozen, canned, dried)* 005
CRUSTACEANS & MOLLUSKS
(shrimp, clams, etc.) 006
T.V.P. TYPE FOODS* 007
UNKNOWN MEAT 008

CHEESE (including cottage cheese) .. 010
MILK* 011
ICE CREAM
(also ice milk, sherbet)* 012
OTHER DAIRY (not butter)..... 013
EGGS (regular, powdered, liquid)* .. 014
BEANS (not green beans)* 015
NUTS 016
PEANUT BUTTER 017
FATS: Saturated* 018
Unsaturated* 019
Bacon, saltpork* 020
Meat trimming 021
CORN (also corn meal and masa)* .. 022
FLOUR (also pancake mix)* 023
RICE* 024
OTHER GRAIN (barley,
wheat germ, etc.)..... 025
NOODLES (pasta) 026
WHITE BREAD 027
DARK BREAD 028
TORTILLAS* 029
DRY CEREALS:
Regular..... 030
High Sugar (first ingredient only) .. 031
COOKED CEREALS
(instant or regular) 032
CRACKERS..... 033
CHIPS (also pretzels) 034

UNKNOWN PRODUCE* 040
FRESH VEGETABLES* 041
CANNED VEGETABLES
(dehydrated also)* 042
FROZEN VEGETABLES* 043
POTATO PEEL* 044
FRESH FRUIT* 045
CANNED FRUIT
(dehydrated also)* 046
FROZEN FRUIT* 047
FRUIT PEEL*..... 048
RELISH, PICKLES, OLIVES* 049

SYRUP, HONEY, JELLIES,
MOLASSES 051
PASTRIES (cookies, cakes
and mix, pies, etc.)* 052
SUGAR* 053
ARTIFICIAL SWEETENERS 054
CANDY*..... 055
SALT* 056
SPICES & FLAVORINGS
(catsup, mustard, pepper, etc.)* ... 057
BAKING ADDITIVES
(yeast, baking powder, etc.)..... 058
POPSICLES 060
PUDDING 061
GELATIN 062
INSTANT BREAKFAST 063
DIPS (for chips)..... 064

NON-DAIRY CREAMERS &
WHIPS 065
HEALTH FOODS* 066
SLOPS* 069
REGULAR COFFEE
(instant or ground)* 070
DECAF COFFEE 071
EXOTIC COFFEE* 072
TEA* 073
CHOCOLATE DRINK MIX OR
TOPPING 074
FRUIT OR VEG JUICE
(canned or bottled) 075
FRUIT JUICE CONCENTRATE 076
FRUIT DRINK, pdr or lqud
(Tang, Koolaid, Hi-C)* 077
DIET SODA 078
REGULAR SODA 079
COCKTAIL MIX (carbonated)..... 080
COCKTAIL MIX
(non-carb. liquid) 081
COCKTAIL MIX (powdered)..... 082
PREMIXED COCKTAILS
(alcoholic) 083
SPIRITS (booze) 084
WINE (still & sparkling) 085
BEER* 086

BABY FOOD & JUICE*..... 087
BABY CEREAL (pablum) 088
BABY FORMULA (liquid)* 089
BABY FORMULA (powdered)*..... 090
PET FOOD (dry) 091
PET FOOD
(canned or moist) 092
TV DINNERS (also pot pies) 094
TAKE OUT MEALS..... 095
SOUPS* 096
GRAVY & SPECIALTY
SAUCES*..... 097
PREPARED MEALS
(canned or packaged)*..... 098
VITAMIN PILLS AND
SUPPLEMENTS
(commercial)*..... 100
PRESCRIBED DRUGS
(prescribed vitamins) 101
ASPIRIN* 102
COMMERCIAL STIMULANTS AND
DEPRESSANTS* 103
COMMERCIAL REMEDIES*..... 104
ILLICIT DRUGS* 105
COMMERCIAL DRUG
PARAPHENALIA..... 106
ILLICIT DRUG PARAPHENALIA .. 107
CONTRACEPTIVES:
MALE..... 108
FEMALE 109
BABY SUPPLIES
(diapers, etc.)* 111
INJURY ORIENTED
(iodine, bandaids, etc.)..... 112
PERSONAL SANITATION* 113
COSMETICS* 114
CIGARETTES (butts)..... 123
CIGARETTES (pack)* 124
CIGARETTES (carton)* 125
CIGARS 126
PIPE, CHEWING TOBACCO,
LOOSE TOBACCO 127

ROLLING PAPERS
(also smoking items)..... 128
HOUSEHOLD & LAUNDRY
CLEANERS* 131
HOUSEHOLD CLEANING
TOOLS (not detergents)..... 132
HOUSEHOLD MAINT. ITEMS
(paint, wood, etc.)..... 133
COOKING & SERVING AIDS 134
TISSUE CONTAINER..... 135
TOILET PAPER CONTAINER 136
NAPKIN CONTAINER 137
PAPER TOWEL CONTAINER 138
PLASTIC WRAP CONTAINER..... 139
BAGS (paper or plastic)* 140
BAG CONTAINER 141
ALUMINUM FOIL SHEETS 142
ALUMINUM FOIL PACKAGE 143
WAX PAPER PACKAGE 144

MECHANICAL APPLIANCE
(tools)..... 147
ELECTRICAL APPLIANCE AND
ITEMS 148
AUTO SUPPLIES 149
FURNITURE..... 150
CLOTHING: CHILD* 151
ADULT* 152
CLOTHING CARE ITEMS
(shoe polish, thread) 153
DRY CLEANING
(laundry also) 154
PET MAINTENANCE (litter)..... 155
PET TOYS..... 156
GATE RECEIPTS (tickets)..... 157
HOBBY RELATED ITEMS..... 158
PHOTO SUPPLIES..... 159
HOLIDAY VALUE (non-food)* 160
DECORATIONS (non holiday) 161
PLANT AND YARD MAINT 162
STATIONERY SUPPLIES 163
JEWELRY 164

CHILD SCHOOL RELATED
PAPERS*..... 171
CHILD EDUC. BOOKS
(non-fiction)..... 172
CHILD EDUC. GAMES (toys)..... 173
CHILD AMUSEMENT READING .. 174
CHILD AMUSEMENT TOYS
(games)..... 175
ADULT BOOKS (non-fiction)..... 176
ADULT BOOKS (fiction)..... 177
ADULT AMUSEMENT GAMES 178

LOCAL NEWSPAPERS* 181
NEWSPAPERS
(other city, national)* 182
ORGANIZATIONAL NEWSPAPERS
OR MAGAZINES
(also religion)* 183
GENERAL INTEREST
MAGAZINES* 184
SPECIAL INTEREST MAGAZINE
OR NEWSPAPER* 185
ENTERTAINMENT GUIDE
(TV Guide, etc.)..... 186
MISCELLANEOUS ITEMS
(specify on back of sheet)* 190

* See Special Notes

Figure 1-C. Garbage Project sorters use the codes displayed here to begin the process of transforming raw garbage into data. The code numbers are supplemented on the recording forms by much more detailed information, such as a discarded item's brand name (if applicable), its type, its weight, the census tract from which it originated, the date of collection, and so on. Not shown here are several pages of specialized instructions, such as this for the item with code number 044: "Do *not* count individual peels; weigh them as a group."

SOURCE: The Garbage Project

tutes the Garbage Project's database. It has all been computerized and amounts to some two million lines of data drawn from some fifteen thousand household-refuse samples. The aim here has been not only to approach garbage with specific questions to answer or hypotheses to prove but also to amass sufficient quantities of information, in a systematic and open-minded way, so that with the data on hand Garbage Project researchers would be able to answer any future questions or evaluate any future hypotheses that might arise. In 1972 garbage was, after all, still terra incognita, and the first job to be done was akin to that undertaken by the explorers Lewis and Clark.

From the outset the Garbage Project has had to confront the legal and ethical issues its research involves: Was collecting and sorting someone's household garbage an unjustifiable invasion of privacy? This very question has over the years been argued repeatedly in the courts. The Fourth Amendment unequivocally guarantees Americans protection from unreasonable search and seizure. Joseph Bonanno, Sr., tried to invoke the Fourth Amendment to prevent his garbage from being used as evidence. But garbage placed in a garbage can in a public thoroughfare, where it awaits removal by impersonal refuse collectors, and where it may be picked over by scavengers looking for aluminum cans, by curious children or neighbors, and by the refuse collectors themselves (some of whom do a thriving trade in old appliances, large and small), is usually considered by the courts to have been abandoned. Therefore, the examination of the garbage by outside parties cannot be a violation of a constitutional right. In the Bonanno case, U.S. District Court Judge William Ingram ruled that investigating garbage for evidence of a crime may carry a "stench," but was not illegal. In 1988, in *California* v. *Greenwood,* the U.S. Supreme Court ruled by a margin of six to two that the police were entitled to conduct a warrantless search of a suspected drug dealer's garbage—a search that led to drug paraphenalia, which led in turn to warrants, arrests, and convictions. As Justice Byron White has written, "The police cannot reasonably be expected to avert their eyes from evidence of criminal activity that could have been observed by any member of the public."

Legal issues aside, the Garbage Project has taken pains to ensure that those whose garbage comes under scrutiny remain anonymous.

Before obtaining garbage for study, the Project provides guarantees to communities and their garbage collectors that nothing of a personal nature will be examined and that no names or addresses or other personal information will be recorded. The Project also stipulates that all of the garbage collected (except aluminum cans, which are recycled) will be returned to the community for normal disposal.

As noted, the Garbage Project has now been sorting and evaluating garbage, with scientific rigor, for two decades. The Project has proved durable because its findings have supplied a fresh perspective on what we know—and what we think we know—about certain aspects of our lives. Medical researchers, for example, have long made it their business to question people about their eating habits in order to uncover relationships between patterns of diet and patterns of disease. These researchers have also long suspected that people—honest, well-meaning people—may often be providing information about quantities and types and even brands of food and drink consumed that is not entirely accurate. People can't readily say whether they trimmed 3.3 ounces or 5.4 ounces of fat off the last steak they ate, and they probably don't remember whether they had four, five, or seven beers in the previous week, or two eggs or three. The average person just isn't paying attention. Are there certain patterns in the way in which people wrongly "self-report" their dietary habits? Yes, there are, and Garbage Project studies have identified many of them.

Garbage archaeologists also know how much edible food is thrown away; what percentage of newspapers, cans, bottles, and other items aren't recycled; how loyal we are to brand-name products and which have earned the greatest loyalty; and how much household hazardous waste is carted off to landfills and incinerators. From several truckloads of garbage and a few pieces of ancillary data —most importantly, the length of time over which the garbage was collected—the Garbage Project staff can reconstruct the community from which it came with a degree of accuracy that the Census Bureau might in some neighborhoods be unable to match.

Garbage also exposes the routine perversity of human ways. Garbage archaeologists have learned, for example, that the volume of garbage that Americans produce expands to fill the number of receptacles that are available to put it in. They have learned that we waste more of what is in short supply than of what is plentiful; that attempts by individuals to restrict consumption of certain foodstuffs are often counterbalanced by extra and inadvertent consumption of those same foodstuffs in hidden form; and that while a person's memory of what he has eaten and drunk in a given week is inevitably wide of the mark, his guess as to what a family member or even neighbor has eaten and drunk usually turns out to be more perceptive.

Some of the Garbage Project's research has prompted unusual forays into arcane aspects of popular culture. Consider the matter of those "amulets" worn by the Sohites—that is, the once-familiar detachable pop-top pull tab. Pull tabs first became important to the Garbage Project during a study of household recycling practices, conducted on behalf of the federal Environmental Protection Agency during the mid-1970s. The question arose: If a bag of household garbage contained no aluminum cans, did that mean that the household didn't dispose of any cans or that it had recycled its cans? Finding a way to answer that question was essential if a neighborhood's recycling rate was to be accurately determined. Pull tabs turned out to hold the key. A quick study revealed that most people did not drop pull tabs into the cans from which they had been wrenched; rather, the vast majority of people threw the tabs into the trash. If empty cans were stored separately for recycling, the pull tabs still went out to the curb with the rest of the garbage. A garbage sample that contained several pull tabs but no aluminum cans was a good bet to have come from a household that recycled.

All this counting of pull tabs prompted a surprising discovery one day by a student: Pull tabs were not all alike. Their configuration and even color depended on what kind of beverage they were associated with and where the beverage had been canned. Armed with this knowledge, Garbage Project researchers constructed an elaborate typology of pull tabs, enabling investigators to tease out data about beverage consumption—say, beer versus soda, Michelob versus Schlitz—even from samples of garbage that contained not a single can (see Figure 1-D). Detachable pull tabs are no longer widely used in beverage cans, but the pull-tab typology remains useful even

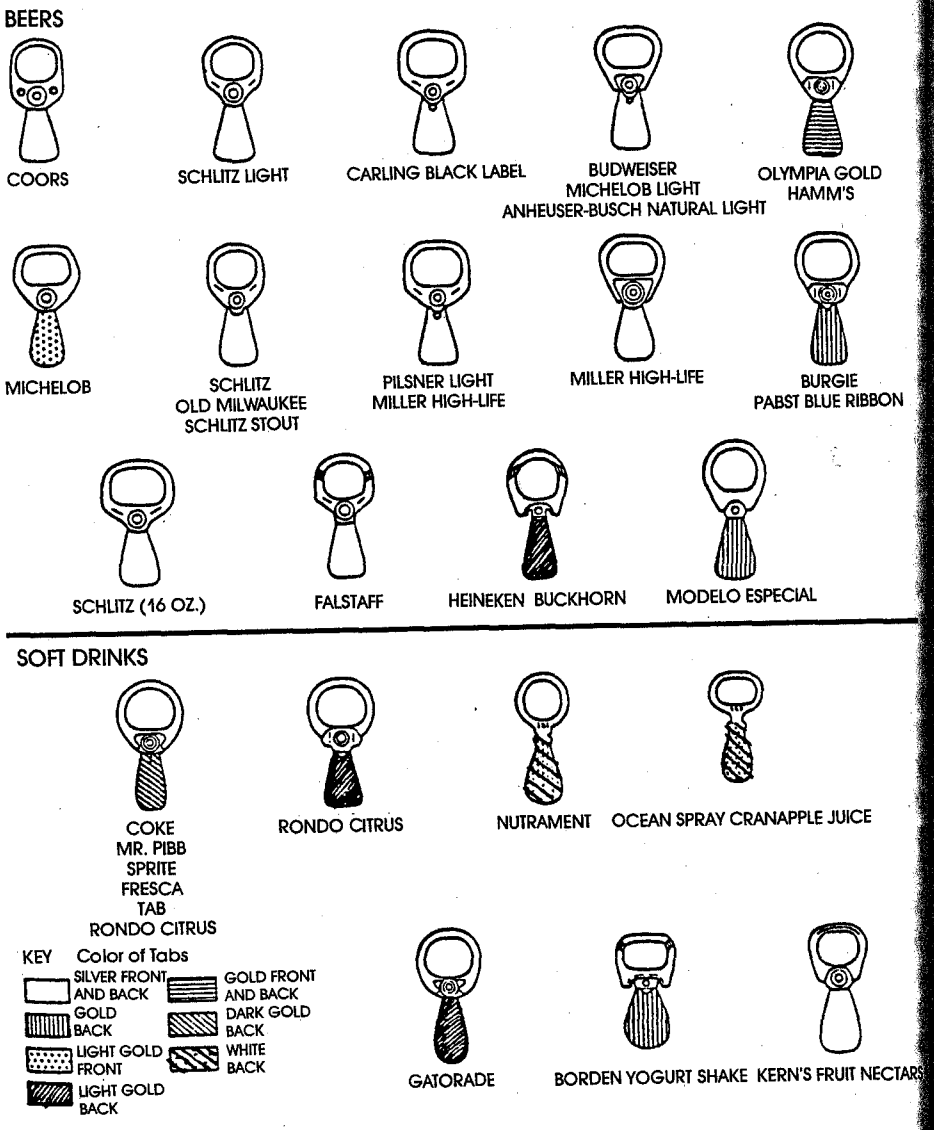

Figure 1-D. Shown here is a portion of the Garbage Project's pull-tab typology for the city of Tucson, underscoring the widespread stylistic variation even in relatively standardized everyday items. The typology was originally developed to assist in a study of recycling behavior for the Environmental Protection Agency.

SOURCE: The Garbage Project

now. Among other things, in the absence of such evidence of chronology as a newspaper's dateline, pull tabs can reliably help to fix the dates of strata in a landfill. In archaeological parlance objects like these that have been widely diffused over a short period of time, and then abruptly disappear, are known as horizon markers.

The unique "punch-top" on Coors beer cans, for example, was used only between March of 1974 and June of 1977. (It was abandoned because some customers complained that they cut their thumbs pushing the holes open.) In landfills around the country, wherever Coors beer cans were discarded, punch-top cans not only identify strata associated with a narrow band of dates but also separate two epochs one from another. One might think of punch-tops playfully as the garbage equivalent of the famous iridium layer found in sediment toward the end of the Cretaceous Era, marking the moment (proponents of the theory believe) when a giant meteor crashed into the planet Earth, exterminating the dinosaurs.

All told, the Garbage Project has conducted nine full-scale excavations of municipal landfills in the United States and two smaller excavations associated with special projects. In the fall of 1991 it also excavated four sites in Canada, the data from which remains largely unanalyzed (and is not reflected in this book). The logistics of the landfill excavations are complex, and they have been overseen in all cases by Wilson Hughes. What is involved? Permission must be obtained from a raft of local officials and union leaders; indemnification notices must be provided to assure local authorities that the Garbage Project carries sufficient insurance against injury; local universities must be scoured for a supply of students to supplement the Garbage Project team; in many cases construction permits, of all things, must be obtained in advance of digging. There is also the whole matter of transportation, not only of personnel but also of large amounts of equipment. And there is the matter of personal accommodation and equipment storage. The time available for excavation is always limited, sometimes extremely so; the research program must be compressed to fit it, and the staff must be "tasked" accordingly. When the excavation has been completed the samples need to be packed and shipped—frequently on ice—back to headquarters or to specialized laboratories. All archaeologists will tell you

that field work is mostly laborious, not glamorous; a landfill excavation is archaeology of the laborious kind.

For all the difficulties they present, the Garbage Project's landfill digs have acquired an increasing timeliness and relevance as concerns about solid-waste disposal have grown. Even as the Garbage Project has trained considerable attention on garbage as an analytical tool it has also taken up the problem of garbage itself—garbage as a problem, garbage as symbolized by *Mobro 4000,* the so-called "garbage barge," which sailed from Islip, Long Island, on March 22, 1987, and spent the next fifty-five days plying the seas in search of a place to deposit its 3,168 tons of cargo. Strange though it may seem, although more than 70 percent of America's household and commercial garbage ends up in landfills, very little reliable data existed until recently as to a landfill's contents and biological dynamics. Much of the conventional wisdom about garbage disposal consists of assertions that turn out, upon investigation, to be simplistic or misleading: among them, the assertion that, as trash, plastic, foam, and fast-food packaging are causes for great concern, that biodegradable items are always more desirable than nonbiodegradable ones, that on a per capita basis the nation's households are generating a lot more garbage than they used to, and that we're physically running out of places to put landfills.

This is not to say that garbage isn't a problem in need of serious attention. It is. But if they are to succeed, plans of action must be based on garbage realities. The most critical part of the garbage problem in America is that our notions about the creation and disposal of garbage are often riddled with myth. There are few other subjects of public significance on which popular and official opinion is so consistently misinformed.

This book is a summary of the research conducted and discoveries made by the Garbage Project over the course of two decades. In the following chapters we will first step back for a moment into human history and look at the place of garbage in it. We will then move on to some of the insights into human behavior that an examination of garbage can yield. We will next venture inside a landfill and examine its actual contents, and try to understand what happens—and doesn't happen—to the garbage that winds up there. We will conclude by discussing a few issues that receive a great deal of vocal attention, such as incineration and recycling. Along the way there will be digressions large and small—about disposable diapers, about the demographics of garbage, about many other odd or essential things.

Gaps—large gaps—remain in our knowledge of garbage, and of how human behavior relates to it, and of how best to deal with it. But a lighted candle has at least been seized and thrust inside the antechamber.