Wasting Away

AN EXPLORATION OF WASTE: WHAT IT IS, HOW IT HAPPENS, WHY WE FEAR IT, HOW TO DO IT WELL

Kevin Lynch

WITH CONTRIBUTIONS BY EDITOR
Michael Southworth

"Decline, decay, and wasting are a necessary part of life and growth; we must learn to value them and to do them well. This is one of the messages of Kevin Lynch's last book, *Wasting Away*. Of all living creatures, humans are the supreme creators of waste, yet only recently have we started to think seriously about the ways in which we waste. It is becoming clear that our wasting affects us deeply—our feelings, our health and daily comfort, and our very survival are threatened by it."—Michael Southworth, from his Introduction

Kevin Lynch (1918–1984), a major figure in American urban design and city planning, worked with Frank Lloyd Wright at Taliesin and later taught city planning at MIT, where he influenced a generation of urban designers, city planners, and architects. In *Wasting Away*, Lynch explores another side of growth and development—the role of waste, loss and decay. It is an unpleasant subject for most people, he notes, and our aversion to thinking about waste has kept us from finding better ways to deal with it.

Wasting Away provides a comprehensive overview of waste processes in the natural world and in human cultures of many eras and lands, discussing military waste, vandalism and wrecking, arson, scavenging, abandonment and dereliction, and reuse. Richly illustrated with images of the many faces of waste, the book draws examples from history and literature, anthropology, myth, and the visual arts. Lynch shows how one person's waste may be another's resource, such as the Irish farmer's valued manure pile, or works of art and architecture made from discarded materials. He defines waste in a new light and presents his philosophy of "positive wasting"—an approach both practical and visionary, grounded in the inevitability of change, the laws of matter and energy, and the contradictory human impulses toward preservation and destruction.

"To see life whole, we must attend to loss," Lynch writes. "Why not take pleasure in breaking things when they must

(continued on back flap)

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Editor's Introduction

DECLINE, DECAY, AND WASTING are a necessary part of life and growth; we must learn to value them and to do them well. This is one of the messages of Kevin Lynch's last book, *Wasting Away*. Of all living creatures, humans are the supreme creators of waste, yet only recently have we started to think seriously about the ways in which we waste. It is becoming clear that our wasting affects us deeply—our feelings, our health and daily comfort, and our very survival are threatened by it. No longer can we ignore our wastes, send them to Third World countries, or bury them in deep and obscure places, for they will return to haunt us.

Lynch's ideas about wasting remain valid; in fact, they are even more relevant today. Since his death in 1984, the problems of waste have accelerated with major disasters such as Bhopal, Chernobyl, and Valdez. The infamous barge of Long Island garbage made headlines as it searched half the world for a place to dump. In the summer of 1988 medical waste, including syringes and vials of blood (some of it contaminated with the AIDS virus), washed up onto the beaches of the Northeast, and in San Francisco beaches had to be closed when sewage plants broke down. Some scientists warn that the depletion of the ozone layer and the warming of the earth—both attributable to our wasting—may be happening much faster than we had thought. Questions of what to do with that most difficult and dangerous of wastes—nuclear waste—have come to the forefront as communities and states reject nuclear waste disposal sites. Even the safety of the maximum security depository now being constructed in salt caverns near Carlsbad, New Mexico, is uncertain.

Those who knew Kevin Lynch could not fail to be impressed with the range and depth of his thinking. For more than three decades he was a professor of city and regional planning at the Massachusetts Institute of Technology and was well known for his contributions to the

theory and practice of urban design and planning. However, his work went beyond these fields into such realms as psychology, philosophy, and ethics. At the time of his sudden death at the age of 66 he was at work on this, his ninth book.[1] It may surprise those familiar with his previous works that this book is on the subject of waste, since he spent most of his career writing about the planning and design of cities and regions, with special emphasis on their sensuous form. Although his early work was usually pragmatic, positive, and directed toward the environmental design professions, his later efforts became increasingly philosophical. This book represents a natural progression in his consideration of all aspects of urban life. He saw that we are headed in a self-destructive direction that has implications for virtually every profession, including urban planning. The book is not a warning, but a plea to acknowledge most waste and the processes of wasting as valuable and necessary in the life of people, things, and places.

Historically, urban planning has not been particularly concerned with natural systems, focusing instead on man-made changes to the environment. The assumption seems to have been that technology and planning could solve all problems and could overcome natural constraints. But the limitations of technology have become all too evident as we struggle to provide water to cities in arid climates, to clean up toxic wastes that contaminate urban water supplies, or to rebuild cities destroyed by natural disasters. The appropriate management of waste is essential to achieving a life-enhancing environment. Some of the basic values underlying urban planning, in fact, relate directly to waste management. One value is to maintain and provide for the *health* and *safety* of human settlements. A second value is achieving *efficiency*, one that implies that land and other resources should be put to their best use, without wasting them. A third waste-related value, the need for *adaptability*, requires that instead of wasting resources that are no longer useful, they should be recycled. Much planning is occupied with doing just this: finding new uses for old military bases, dying city centers, or industrial areas, to name a few. It is as important for planners to help places decline or even die gracefully as it is to promote development and growth. Increasingly, planners will be called upon to manage waste processes and the consequences of waste-related

disasters. So the reader will see that the topic is—or should be—central to planning.

The subjects of change, decline, transformation and reuse—all of which are part of waste and wasting—had long been of deep interest to Lynch and formed a continuous thread in his works. His 1947 MIT thesis for his Bachelor of City Planning degree, *Controlling the Flow of Rebuilding and Replanning in Residential Areas,* is an early indication of his interest in change, depreciation, and waste in the built environment. In it he explores the possibilities for encouraging more rapid replanning and rebuilding of housing. Later in his European travel journals of 1952–53, he often noted landscapes of waste, commenting on the waste land in the hills outside Siena and along the Mugnone Valley near Florence: the "country east of Siena is a nightmare: bald hillocks with nothing but grass, or plowed or barren, bubbling about you for miles . . . Erosion at work." He observed with enthusiasm how children at play delighted in waste things and waste spaces. In later works he often argued for the importance of "waste spaces" in the city—for children's play, for adaptability to future uses, for the survival of other species.

In *Site Planning* (1962), Lynch discussed land reclamation and the opportunities for reuse of derelict land such as rail yards, cattle yards, or flood lands. He emphasized that waste lands, however derelict they might seem, are likely to be important to someone or to some form of life and may be essential to future adaptability. Indeed, he observed that the modern suburb may have too little waste space for its own good. In *Good City Form* (1981) and *Growing Up in Cities* (1977), as well as in "The Openness of Open Space,"[2] he advocated urban wilderness or "waste" space where children could find adventure and freedom from control. Two of his late professional projects, Columbia Point and Franklin Field in Boston, involved the problem of reuse of semiderelict public housing that had been built in urban waste spaces.

In his book *What Time Is This Place?* (1972) Lynch focused on one aspect of wasting: the perception, expression, and management of change in the environment. Here his accounts of the English industrial wastelands created by coal mining and the potteries of Stoke-on-Trent are particularly vivid. He often admonished planners and architects not to think of the environment in static terms, but to deal with change—to accommodate it, to express

it, to celebrate it. His study for San Diego, *San Diego: Temporary Paradise?* (coauthored with Donald Appleyard, 1974), focused on the systematic destruction of the very special qualities that drew people to that region in the first place, destruction by shortsighted development that has ignored the ecological and geographic setting. Toward the end of his life, as the arms race accelerated and the hazards of nuclear and industrial wastes became more threatening, the topic of waste became an urgent one for him. Thus, two of his late articles, "What Will Happen to Us?" and "Coming Home,"[3] speculate on the devastating impact of nuclear war on daily life and the environment.

Kevin Lynch's ideas on wasting were evident in his waste-conscious, almost frugal life-style. He was fastidious about recycling paper, aluminum, and glass, and he composted vegetable matter long before doing so was widely promoted. Time in his household was well managed, with a balance between work and relaxation and with no television to waste it. When writing his books, he always used paper on both sides before discarding it (he wrote part of the first draft of this book on the reverse side of the manuscript for *Good City Form*). His family recalls that at meals he would sometimes say that it was just as wasteful to eat something you didn't want or need in order not to have it "go to waste" as it was to throw it away, or "put it in the refrigerator so we can throw it out tomorrow." He took pride in the "Clivus Multrum" ecological toilets he installed in both his Martha's Vineyard and New Hampshire homes, the latter being one of the first in the state. When seeing tourist sights such as the Georgian homes of Dublin he particularly enjoyed going around to see the backsides where the real life—and decay—was exposed without pretense.

The reader will not find here a scientific study of waste or a "how to" manual. Rather this book is a philosophical and social inquiry into processes of wasting. It raises many questions and provides few answers. Although it touches on the science and technology of waste processes, more importantly, it addresses the social and psychological implications of waste. Parts of the book may seem forbidding or unpleasant—most people do not enjoy thinking about or dealing with waste. Lynch examines the processes of wasting from many points of view, some of them novel and insightful, some controversial, but

always with the humanism and wit that we expect in his writing. He synthesizes material from many fields including anthropology, history, the natural and social sciences, and planning. We even learn about waste in celebration, ritual, and art.

Lynch's conception of waste was broad, including phenomena as diverse as everyday trash and garbage, but also derelict land and buildings or destruction and decay in nature. He noted that "there are hardly more than a hundred words in the language that have as many dictionary definitions." Characteristically, he tried to expand readers' conceptions by reducing the notion to its most fundamental meaning and then exploring its many implications: "Waste," he wrote, "is what is worthless or unused for human purpose. It is a lessening of something without useful result; it is loss and abandonment, decline, separation and death. It is the spent and valueless material left after some act of production or consumption, but can also refer to any used thing: garbage, trash, litter, junk, impurity and dirt. There are waste things, waste lands, waste time and wasted lives."

The book begins with a prologue that includes two fantasies of wasting. Not at all pleasant, both are extremes to make vivid the consequences of too much or too little wasting. Lynch was fascinated with utopias—and cacotopias, those hellish nightmares that are the opposite of utopia. He found them instructive and he often used them in his writing and teaching to tantalize and to stimulate thought. These fantasies are verbal snapshots that quickly engage the reader in the subject.

Next, in "Morbid and Dirty Thoughts," he takes us on a far-ranging inquiry into waste in society. Why are we so uncomfortable with waste and wasting? Is wasting ever valued and celebrated? Looking at waste in many cultures, he talks about class and waste, eating, cleaning, and death, among other subjects. The next two chapters, "The Waste of Things" and "The Waste of Place" lead us through many kinds of waste processes, beginning with wasting in nature, then wasting in human society: military waste, vandalism and wrecking, arson, scavenging and collecting, abandonment and dereliction, and reuse.

"Looking at Waste" and "Talking About Waste" (Appendix A) are vivid accounts of what waste processes—good and bad—look like in the environment and what waste means to people. A hallmark of Lynch's work was

the way he grounded his ideas, and tested them, in the perceptions of the layperson, an approach that began with his pioneering work, *Image of the City*. Thus, in "Talking About Waste" he reports on people's attitudes toward waste based on a small sample of interviews.

In "Then What Is Waste?" Lynch is at last ready to define *waste* and to explore the differences between waste and other types of loss. The final chapter, "Wasting Well," presents and illustrates his philosophy of positive wasting: we must learn to think positively and creatively about waste and wasting, for it is an essential part of life and growth; we must learn to waste well and to take joy in it.

My role as editor of this book began after Lynch's death. I was a student of his at MIT and knew him well for more than two decades. We had discussed the subject of urban waste and wastelands on many occasions. At the time of Lynch's death, the manuscript was largely completed and had been edited at least once by him, but the final organization, references, illustrations, and editing had not been done. It is clear from his notes that he was still thinking about the book's structure, as well as its title. Lynch was not yet satisfied with the manuscript and was not quite ready to publish it. Yet those who read it found much that stimulated thinking and provoked new ways of approaching the dilemmas of waste. They felt strongly that it should be made public. When I received the manuscript, the notes and references had not been prepared, nor had the bibliography. A rudimentary file of possible illustrations existed, but none of them had been placed or captioned, and many more illustrations were needed. Thus, part of my role as editor was to develop a final structure for the book and to select a title. In several chapters I worked to improve continuity and clarity, to eliminate repetition, and to update certain sections, but I have tried to avoid major rewriting. All of the illustrations and captions were selected and written by me. Considerable effort went into documenting Lynch's references and developing the bibliography, based in part on study of his research files, which span a 25-year period for this book alone. (See Appendix B, "Notes on Editorial Methodology" for more information.)

Thanks are due to several people for their contributions to this work: to the Lynch family—his wife, Anne, and their children, Catherine, David, Laura, and Peter; to my research assistants Rajeev Bhatia, Kimberly Moses, and

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Royalties from *Wasting Away* will be contributed to the Kevin Lynch Award Fund at MIT, established to recognize work that promotes our understanding of the human environment or exemplifies the creation of an environment with the participation of the people who use it.

Michael Southworth
3 May 1990, Berkeley

Wasting Away

PROLOGUE

I. The Dark Side of Change

"Change and decay all around I see.
O Thou who changest not,
Abide with me."

Henry Francis Lyte (1793–1847)

EVERYTHING CHANGES, AND DEATH is a strategy for maintaining biological patterns in the presence of change. We are conscious beings whose brains are fitted to recognize stability, separation, and sudden moves. So we regard death, and most change, as tragic and confusing. We fear death; we fear loss; we fear waste, which is the signal of loss. The worst change is decline, wasting away, growing old. Waste is an impurity to avoid or to wash off. Things should be clean and permanent, or better, should constantly increase in competence and power. But permanence and growth form a dilemma, since permanence is stagnation and growth is instability.

After some painful experience, planning has come to recognize the existence of change. We can no longer support Montaigne's dictum: "There is, in public affairs, no state so bad, provided it has age and stability on its side, that is not preferable to change and disturbance."[1] Techniques have been developed to welcome and manage an increase, but even then, we are liable to picture that increase as an initial change followed by some permanent state. Our approach to decline, however, is one of avoidance: reverse the trend, or cover it up, or pay off the losers and close it out.

Waste and loss are the dark side of change, a repressed and emotional subject. There is a pornography of waste, just as there is a pornography of sex and death. Slide

shows about Roman ruins usually include a view of the seats in Roman latrines. Sewerage, a useful but not entirely dignified branch of engineering, is enobled as "sanitary." We are fascinated to see a building torn down. Environmental tracts always include a view of a garbage heap. The abandoned houses in our inner cities are one of the most powerful images of the American metropolis. The adjective *dirty* has multiple overtones.

The accumulation of solid waste, the increasing pollution of water and air, have become our preoccupations. Nothing disposes easily any more; our old poisons return to us. Cities decay, and new ones grow too fast. What if those new ones should begin to decay? It's all a nasty business.

We will discuss that nasty business: the waste of things and places—the garbage discarded every day, the communities abandoned over the course of generations. Are there ways of wasting well?

In the heat of an argument about the environment and the economy, Bayard Rustin once exclaimed, "No one is for waste!" Let us make a brief for it.

II. Fantasies

WASTING IS A NECESSARY part of living, yet if the processes are not well managed, life itself is threatened. Even when waste is prevented, the results can be deadly, but in a different way. What would a world be like where waste was out of control? Two fantasies explore the consequences of too much and too little waste, both of them nightmares of what may come to pass.[2]

A Waste Cacotopia

The inhabited buildings slowly extrude their continuous ribbons of compressed garbage and trash. The ribbons fall onto the cargo belts that move steadily toward the high ridges at the city boundary. In these populous continents, each city presses against the next, and so the waste ridges form a network, through which tunnel the intercity roads. Each city posts frontier guards, to prevent a neighbor from tipping its trash over the crest.

The waste ribbons are unloaded high up, and are shaped to settle compactly, at a high angle of repose. As the base of the waste-belt expands, it presses the settlement into a narrower territory. Few extensive uses remain, since food and water are shipped in from a distance, with consequent leakage and spoiling. Yet the ground is encumbered with abandoned buildings and weedy lots of uncertain ownership, so that it is difficult for a city to contract efficiently into a denser formation. Men wearing respirators and mounting big machines are at work daily in this no man's land, demolishing buildings, slashing weeds, and spraying dangerous insects and vermin. Truant children play in these jungles, too, and deplorable accidents are common.

At greater expense, a city may have its trash carried to some distant uninhabited sink. The Grand Canyon is partly full, a permanent conduit having been reserved for the Colorado underneath. The Mindinao Deep is shallow now, and Holland is well above sea level. However, as wastes have been piled over the Arctic snowfields, the surface darkening, along with the greenhouse effect of the polluted atmosphere, has caused melting of the ice and a rising sea level.

The inhabited settlements jut out over the seas, or are built over the larger rivers, which have been straightened and lined with a glassy coat in smooth cross section, to carry the flow more rapidly to the ocean. Thus, the settlements can evacuate directly into the liquid medium below. Filters remove the coarser ejecta, however, so that stream or tidal flow will not become too viscous. Imported water is added to the channel, to keep the whole in motion. Since buildings are sealed, the resulting odors are not so noticeable. The ocean itself, too corrosive for the hulls of ordinary ships, and so littered with floating debris as to make navigation hazardous, is traversed by long submarine tunnels.

Ordinary fumes are vented to high altitudes; toxic dusts and gases are sealed in thin bags and ejected into space. These bags are strong enough to confine their contents until well away from earth, and are highly reflective, so that passing craft can easily avoid them. Aerial sweepers keep the approach lanes open through the air around the major landing sites. These sites are also favored locations for vacation hotels, since the sun or moon can frequently be glimpsed through the aerial openings.

To replace the material so rapidly consumed, the earth, the moon, two planets, and several asteroids are mined for minerals, oxygen, water, and hydrocarbons. As the earth is hollowed out underneath and the wastes pile up on its surface, there is concern that its rock beds may collapse downwards, vulcanism in reverse. To prevent this, wastes are injected into the empty mining galleries. Later, however, they are drilled out again, as the productive appetite swells for new minerals or for lower grades of previously mined material.

This massive transport and transformation of matter requires a corresponding expenditure of energy. Once expended, it is vented as pervasive noise, or as waste heat. Since the earth's radiation into space cannot match the flow, this venting energy has resulted in a persistent warming of the climate. Recently then, radiators have been transported to the troposphere, to step up this outward flow.

Fossil hydrocarbons are almost depleted, and the forests are stunted or cut over. Nuclear and solar power are now the prime sources of energy. The former is constrained to the rate at which its by-products can safely be spewed forth into space, since far too much of the

earth's surface is already contaminated by radioactivity. Solar power, on the other hand, is inhibited by the increasing opacity of the atmosphere. For the most part, solar energy is now collected by orbiting panels flying above the smog. In order to increase this source of energy, and since the earth is now more securely shielded from solar radiation, new destabilizing compounds are being shot into the atomic furnace of the sun to speed up the rate of nuclear fusion, accelerating the sun's stellar evolution. This shortening of the active life of the sun is not considered likely to affect the life span of the human species.

More than half of the more recent living species are now extinct, due to complete disruption of their habitats. Some few, most dear or useful to man, have been brought inside, or live in protected areas, or have been fitted with respirators and other prosthetic devices. The parasites of man have done rather well, and cluster in and near his defended settlements. Other surviving creatures, especially those of the more primitive orders, have evolved rapidly under the stress, taking advantage of the rich flow of toxins, wastes, and heat. These new organisms, which bloom and subside, periodically invade the human territories.

Human beings themselves must be more active and aggressive. Women bear 10 to 20 children, so that the strongest may be selected and the weak put away. Life is short and full of incident. Riots and demonstrations are frequent; cities contend against each other, their armies trampling back and forth.

Celebrations, displays, and the trading of possessions sustain the passage of goods, so necessary to the system of production. Splendid feasts are prolonged by vomiting. The casual destruction of valuables before the envious eye of many spectators is the best evidence of wealth and power.

The houses of the rich are spotless, kept clean by sophisticated machines in the hands of the low-class sweepers. Surroundings grow somewhat dirtier as one descends the income scale. Multiplying the rate of consumption by the degree of cleanliness gives the measure of social rank. A sophisticate eats rapidly, washes often, and dons fresh clothes after every meal.

Waste and death are not mentioned in polite society. Unwanted infants are exposed at night in remote places.

Adults die in special hospitals, to which they have been sent, nameless, to be purified. Children are taught to excrete unnoticed, in the secret places hanging over the sewer streams. They learn not to speak of rivers. Among themselves, they may snigger over the fat tubes of waste squeezed out beneath the buildings, or the teasing way in which the smoking chimneys poke up into the air. The shame of wasting keeps the social ranks in place.

A Wasteless Cacotopia

Escape that nightmare to dream of a society freed of waste. No more garbage, no more sewage; clean air, an unencumbered earth. Everything fully used, no rotting food, no loss in storage. Plants and animals will be bred to reduce their useless parts: stringless beans, boneless chickens, skinless beets. They will be shipped in cubes, but not far. Food is produced where it is consumed, and is just ready at the moment of consumption. Leftovers are unknown. There is no deep mining. Things are made of wood and bone and animal hair. Energy comes from food, or directly from the sun. Fire has been given back to Prometheus, and the air is clear.

Weeds and useless animals will not be found, even in the most remote areas: no crabgrass, bindweed, cat briar, water hyacinth, goldenrod, hedge rose, ant, or shrew. Nor are there any parasites. Mice, rats, cockroaches, raccoons, sparrows, gulls, mosquitoes, fleas, weevils, germs have all vanished. Dogs and cats are not kept, and strays not tolerated. Useful plants grow in evenly spaced rows, many of them in extensive glasshouses. No plant shades another. Deciduous plants are no longer favored, for fear of autumn leaves. Mirrors distribute solar radiation to the north sides of hills and buildings.

There are no empty buildings or vacant lots, no useless side yards or barren rooftops, no long corridors, crawl spaces, or odd nooks. Buildings have regular shapes, without misfit additions. They last for generations, so that everyone lives in an ancestral home. It is built to a standard plan, of the material taken from its foundations. When it wears out, it does so completely, crumbling into deposits of useful material. Indoors and out, all space is completely used. Rooms are small and low, a close fit to body dimensions. Settlements are compact and ordered, intricately miniaturized, just as Soleri[3] predicted. They are dark, cold, and silent, warmed by the sun and by body heat, which is retained by bundling and by thick clothing. Buildings are completely insulated, and vent no

gas. There is no city heat island, no smog. When on infrequent occasion a change is necessary, it is planned to happen rapidly in some clearly bounded area. As a space is abandoned, it is immediately taken up.

Time is as efficiently used as space: factories run continuously, streets are just full, beds always slept in, meals prepared and eaten in continuous shifts. Gardens grow all the year, since mirrors in outer space have equalized the flux of solar radiation. Fur storage is a lost trade. It is generally bright but cool. Violent storms never occur. Rains are light drizzles, falling entirely on the agricultural areas, leaving dry the mountainsides. The wasteful hydrologic cycle has been minimized by taking up the flowing water for continuous closed cycling within the buildings and great glasshouses. So rivers are dry at their mouths, and the sea has fallen. The ocean surface is now less than that of the land. Sea travel is by sail, but this is slow, due to the diminished winds. Land travel, of course, is restricted to walking, cycling, or animal traction. But, since travellers are scarce and few goods are carried far, little time is thereby wasted.

Cautious genetic manipulation has allowed body size to be standardized, with enormous savings in all clothing and equipment. This size is smaller than before, bringing it closer to an efficient balance between heat loss and the intake needed for body maintenance. Smaller size has created additional savings in settlement space and the size of gear. Children reach this normal size rather rapidly, making leaps from one standard intermediate size to another, thus reducing the range of required children's sizes. The awkward period of immaturity, which is a wasteful time for all organisms, is accomplished expeditiously. People are passive and calm, a personality trait reinforced by selected depressants.

Symbiotic bacteria help the body to recycle much excrement internally, so that human waste is slight, and the intake of food is reduced. Cooking is accomplished by solar heat, and much food is eaten raw. Children are taught to eat lightly and to retain their body wastes until they can be discharged at approved recycling stations, at times that allow a continuous, efficient run. Feasts are of course immoral, vomiting quite shameful, even when involuntary.

There are no sewer flows and extremely little trash. There is no dirt on the streets, no dust in the houses, no

spills, no breakage, no smoke or smog. Street cleaning is no longer necessary, and all the streams run pure (although their flow is diminished, as we have said, to reduce the waste of water). An occasional recycling station is the only reminder of the old waste ridges.

Even sweat is reduced, since the air is cool and equable. Tears are not proper. The body is sweetly tuned, the vermiform appendix removed at birth. Even if some energy is expended in action, since body mass is not large, heat loss through the skin is low, and unnecessary movement is avoided. No leaps or pirouettes. Walking, an inefficient mode of motion, is now most often replaced by unicycles. People do not move far, of course, since transportation is wasteful. Symbols substitute for journeys, and most people work where they live.

Soap is a lost commodity, bathing and laundry forgotten indulgences. Brooms, mops, and vacuum cleaners are museum pieces. Informative sounds, smells, or light waves are beamed directly to their receivers, instead of spreading wastefully through the air. Those signals that are void of information are suppressed at the source. Machines are noiseless: the sounds of traffic, leaves, and water cannot be detected. This is a silent world, disturbed only by soft, precise, symbolic communications. Friction has been reduced to the minimum needed to keep us erect and keep things in their place. The edges of the continents have been smoothed to reduce the tidal losses. All moving parts slip silently over each other. People do not rub their hands for warmth; fires are prohibited; artificial lights are cold.

There are no waste words or motions: everything is meant to be attended to. Decorations, music, and other superfluous displays are forbidden. No celebrations break the normal round. No one is subjected to repetition, noise, or misinformation. The *Congressional Record* is abolished, along with advertising, gossip, and scholarly papers. There is no inattention, no idleness, no mental drifting. Everyone is either sound asleep or fully awake. Insomnia is the ideal, but it has not been widely achieved. The hours for sleep are short and are set at birth. They are spread evenly throughout the 24-hour day, among equal groups of the population. Since schedules are completely regular, social contacts between these time groups are rare, except where there are overlaps. Mistakes are never made. Although that has eliminated one mode of learn-

ing, the accumulated information store is accurate and accessible.

Clearly, the supreme waste is the loss of a wise and experienced person. Efforts have been directed toward immortality. Other researchers look for a way of transferring memory and personality to a successor. One outcome of this research is that the active life span has been lengthened to several hundred years. Another outcome is that many of the cognitive and emotional patterns of one person can successfully be recorded, and even internalized by a new person. Thus one generation is much like another. Since the life span is long, any accidental death, although rare, is a catastrophe. The approach of natural death is predictable, which affords time for a complete debriefing and a careful settlement of affairs. It is a rather hushed and fearful event.

The birth of a new individual must, in turn, be carefully controlled, in order to replace the dead at one-to-one. This demands detailed prediction and planning. No time is spent in courting or other sexual preliminaries. Sperm and ova are not to be wasted. While intercourse for pleasure is surely not prohibited, it is clearly unnecessary, and must be registered so that proper precautions can be taken. Many women never bear a child, although the male to female ratio is kept low, few males being required. The proper development of embryo and child is unfailing. Early death, or birth defects, are unknown. The child is carefully shielded to prevent them.

Since accidents are rare, they merit headlines. In general, the news might seem a little dull to us. Papers have no riots, disorders, wars, disasters, or struggles of any kind to offer to their readers. All issues are decided expeditiously, without heat or rancor. There is no economic or social competition, no battles over status or the division of resources, no bankruptcies, no business cycles, no unemployment. The great insurance companies are gone with the advertisers, their office towers converted to dovecotes and chicken factories. The old military reservations are farms, or ordered forests where old drill sergeants keep the trees in line. The suppression of military waste alone has raised the world living standards as much as the abandonment of all other forms of conspicuous consumption. Even the police are few in number, because controls are internalized in this well-managed world. Each person is very careful not to do less or more than

is wanted. No one suffers any psychological depression, confusion, neurosis, or psychosis.

Since nothing is forgotten, it is difficult to manage the growing store of information, and scholarly emphasis now lies on the efficient restructuring and elimination of knowledge, rather than on its acquisition. Due to the perfection of memory and the longevity of individuals, learning must be restrained. Time is not wasted, but still it is not overvalued. People content themselves with a slow pace of existence and languid communications. Only perverts want something new. Disgusting images are passed along the underground circuit: titillating descriptions of feasts, dirty hands, warm fires, slaughter, and wild laughter.

This is a predictable world, in which surprise is rare. Elaborate games of chance have been developed in compensation, although of course no material outcomes are staked upon them. While not officially encouraged, they have become quite complex, in order to cope with the powerful predictive abilities of the age. A vicious hunger for novelty and uncertainty, a reminder of our old foolishness, can be slaked in an array of wildly inventive arts. Sadly enough, many people still indulge in them, deep in caverns, at times when they are programmed for sleep.

▪ ▪ ▪

One fantasy has bred another, and neither seems attractive.

CHAPTER ONE

Morbid and Dirty Thoughts

Coming to Terms with Waste

OUR DISCOMFORT WITH WASTING is the creature of our minds as much as a result of objective dangers in the process. Our feelings, which are the accumulations of generations of thought and action, determine how we manage change. We use these ambiguous and negative images to deal with the daily flow of things, but they are also vital to our sense of self. If we want a better fit between what we do and how we think about it, then where we cannot redirect the wasting process we must change our minds. Some human feelings are appropriate to that end, others not. Understanding them is a first step toward managing the world in a better way.

The common words for filth are tense with emotion, and so we use them in conversation to give it an easy color and force. As religion slips from the center of concern, the words of pollution, along with those of sex, take the place of the old calls on God, the devil, and damnation. Simply putting them on a page—shit, piss, crap, pus—will compel the reader's attention. Pollution slang is very rich, which is an indication of our unconscious emphasis. Even when we create polite words as alternatives—words meant to be inoffensive or objective because they draw back from the emotions that swarm over the slang—they either remain linguistic oddities, rarely and self-consciously used (*stool, offal, ordure*) or, as they are accepted into the language, they begin to take on the same emotional color as their predecessors. *Defecate* is one word now undergoing that sea change.

The thought of pollution is widespread among human cultures. Impurity may be material or symbolic. What is impure, how it must be avoided, and the rituals of cleaning are major preoccupations of holy teaching. We are engaged in ordering an apparently chaotic world, and we use separating boundaries to achieve definition and stability. Purity and impurity are exaggerations of those

boundaries, to make the cuts distinct. Even time does not seem to flow, in our perception, but drops in cascades from one quiet pool or era to the next.

Dichotomies

Since our minds are made to distinguish things, we are especially happy with dichotomies. We see wasting in polar forms: useful or useless, front or back, efficient or wasteful, saving or spending, growth or decline, produce or consume, succeed or fail, alive or dead. These are powerful ways of ordering experience, but maintaining such digital ideas requires anxious care, and at times will lead to absurd behavior. A chicken farmer complains that he cannot feed unsold market produce to his birds because it is legally defined as garbage. The ancient Chinese doctrine of yin and yang (and its seductive graphic symbol) intrigues us by its attempt to resolve the dichotomies we have mentally created with a counter-intuition of wholeness: dark/light, cold/warm, female/male, passive/active, water/fire, earth/heaven.

Where customary boundaries are lacking, we lose our grip on things. For example, the internal organs of an animal appear chaotic, compared with its external form. The unaided eye can more easily distinguish a species by its outward shape than by its roots or guts. The expressive external shape is responsive to our long experience with it and to the impact of distinct external forces, and perhaps also to the mutual evolution of sense and sense objects. Nevertheless, with some difficulty, an anatomist can be trained to see rich form in innards that are shapeless, and even repulsive, to most of us.

Definitions are sharpest and most inflexible where identity is most at risk. Ambiguous cues and marginal features are then distorted or suppressed to strengthen the endangered boundary. This occurs, for example, when waste is close to its origins, even if it may later decay to common rubbish and no longer be dangerous. Garbage—living matter in fresh decay—is more disgusting than rags, although both are abandoned organic matter.

Purity and Filth

Thus social agreement about what is impure not only warns us of what is biologically unsafe, but helps us to pattern the world. It can also reassure us that we are a distinct people. Leprosy, although it is difficult to transmit from person to person, is a disfiguring disease that distorts the human form. Society traditionally rejected its sufferers as obscene and lecherous sinners, forced them

to carry a warning bell, and exiled them, or confined them to lazar houses at the edge of town. This rejection helped to make leprosy pandemic in medieval Europe.

The rules regarding food and food containers in orthodox Judaism are another familiar example. They were elaborated and made more precise when the Roman conquest threatened the identity of the Jewish people, and have served to maintain that identity over a long history. Christianity, on the other hand, intent on becoming a universal religion, freed its adherents from those food laws, only to concern itself with other abominations. Paul declared, "Nothing is unclean in itself," but the Council of Jerusalem decreed abstention from the meat offered to idols. Similarly, the behavior manuals of 15th- to 18th-century Europe emphasized the proper management of body wastes: feces, urine, mucus, saliva, wind. Along with the proper ways of speaking and eating, such rules distinguished adult from child, and upper from lower class. To maintain their own particular caste, Brahmins take three baths a day.

The ancient tenets of Shinto exhibit an even more striking concern with purity. Shinto is oriented to life, and the opposite of healthy life—whether it be disease, mutilation, blood, or death—is repulsive. Emperors avoided the palaces of their dead predecessors. If possible, the dying were carried out of the house before they died, to prevent its contamination. Once dead, they were transported out of the city by a special gate, just as we carry our wastes in special pipes and trucks. The Japanese word for wound means defilement. Purification was the major rite, and daily life was hedged about with rules for conserving purity. Perhaps some of the missionary success of Buddhism, imported into Japan in the sixth century A.D., lay in its ability to move into the vacuum left by those concepts of avoidance, just as early Christianity could cope with death and illness in ways that the classical religions of the Mediterranean had not been able to do.

So dirt is an idea bound to context and to culture. It is matter out of place, particularly matter that is unpleasant, dangerous, and difficult to remove. "Unpleasant," "dangerous," and "out of place" are culturally defined, and relative to situation. We look down on people who do not wash their hair, while they may despise us for our careless contact with menstruating women. The bright cornflower of the garden is a weed among the

wheat. On the old Irish farm the manure that so offends us was heaped up before the door, where the farmer could keep his eye on it, for it was the source of good crops and the symbol of fertility. "Where there is muck there is luck." On May-eve, when the mischievous fairies were about, a sprig of rowan, the holy tree, was stuck upright in the heap, to protect the farm.

We are not upset by the litter of our own workroom. None of the jumble is dirt; we have put it there and could put it elsewhere. The disorder is superficial because we are confident of our ability to create a new order. Nothing threatens or impedes us; the confusion is not infectious, it cannot spread. Elsewhere, in a place not our own, we are oppressed by the same display. Returning to a house lately occupied by others, we find everything out of place. "They live like pigs," we say to ourselves (which is an unjust slander of a clean animal, one that we probably despise because it will eat our food waste). When we move, and our things are on the floor, they become a temporary rubbish heap. The desolate aftermath of a flood is even more dismaying: sodden household effects, filmed with mud, lie jumbled on the floor. Earth, water, and possessions, all valuable things, have been mixed into disgusting waste.

There are general intensifiers of dirtiness, once defined. Filth is more loathsome if it is derived from other people, rather than from another species or from nonliving matter. It is more dangerous if we cannot escape it by our own efforts, and if it is an active threat according to our beliefs. It is more upsetting if it pollutes things or places that are normally clean, intimate, or holy. Trash in the house is more dismaying than on the street, in a stream than on a field, in a church than in a garage, on the table than on the floor. It unnerves us if it adheres to our bodies, our clothes, or the things we eat. Filth is dirt too close, particularly if it is a human product: excrement, obscene action, or a foul person.

The dangers of certain kinds of dirt are supported by current scientific theories about infection by living agents, but the aversion to filth is far older, deeper, and broader than germ theory. Indeed, the older aversions made that new theory emotionally acceptable.

Sacred Waste

Dirt also has *mana*, spiritual power. It horrifies and yet attracts us. Because we repress it, we fear it, and thence its power. It spoils the pattern and yet is the material for

a new pattern. It has potential. Some sacred rituals will celebrate dirt, perhaps to express the unity of opposites, or to atone for culturally imposed separation. Such rites externalize our ambiguities and make available the dangerous powers of the unclean. Those who cross the boundary of purity, who abandon themselves to filth or dreams or frenzy, acquire a special strength. Among the Zuni, the dance of the Ne'wekwe fraternity, in which they drank urine and ate excrement, was their most powerful medicine.[1] St. Francis of Assisi rolled naked in filth and called welcome to Sister Death. Buddhist doctrine praises the "sense of foulness," enlightenment gained through the contemplation of decaying corpses, in order to achieve a realization of the cycle of birth and rebirth and an understanding that the refined and the base are in perpetual interchange. Pious tales recount how priests went to the charnel yards at night to perfect this sense of foulness. Early Christians deprecated bodily cleanliness. A hermit's holy dirtiness was admirable, a chastisement of the body like fasting. In these reversals, the thought of dirt, like the thought of death, displays its emotional power.

See figure 55

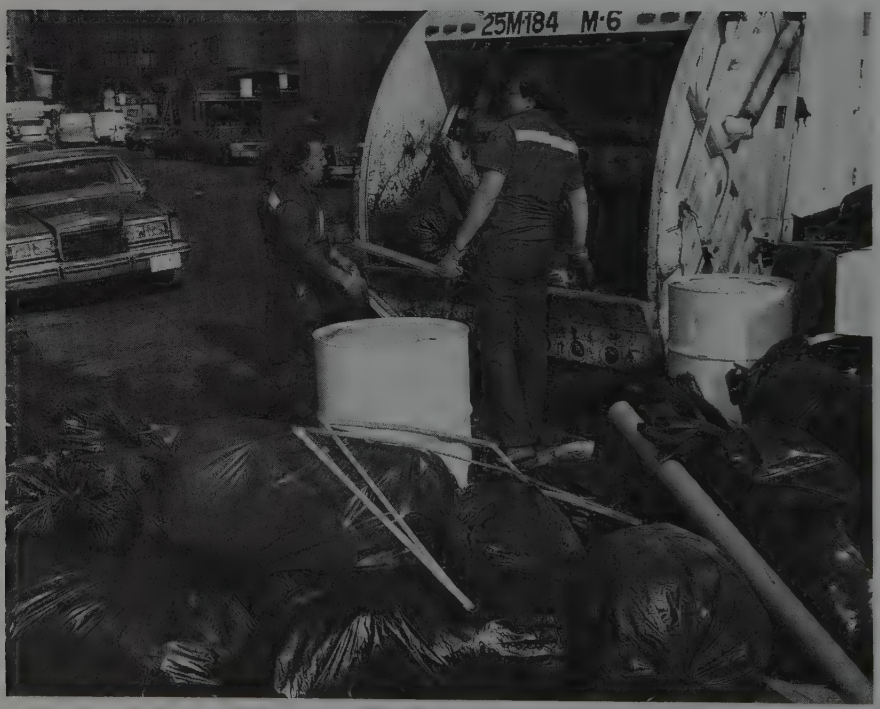
Beelzebub, the Biblical name for the devil, comes from the Hebrew "lord of the flies" (or perhaps "lord of dung"). "Sheol," or hell, was the name of Jerusalem's refuse dump. Hell is full of filth, stench, noise, and monsters that cannot be classified. The early Christian monks went out into the waterless wastelands, to be in the vanguard of God's army against the demons who lived there and who tempted them with visions of power and sex. Egypt's sacred scarab was a dung beetle. Among the Bororo, the shaman with curative powers is summoned to his mission by a "repulsive, foul-smelling, and affectionate aquatic monster . . . whose caresses he is compelled to endure." Another type of shaman—the one who foretells sickness and death and is himself possessed by a nature spirit—must account to that spirit for all his refuse. He may throw nothing away, but must carry his debris with him for his entire life.[2]

There are variations among individuals, as well as among cultures, as to the extent to which dirt will be tolerated. Differences are a frequent source of family and neighborhood conflict; in our culture, it is a battle of the generations. Some people are obsessed with cleanliness. They wash with such frequency and avoid pollution with such care as to frustrate themselves and alienate their

friends. Others are quite careless of group norms, or rebellious against them. We judge the latter immoral and disgusting, the former ridiculous and difficult. Our style of handling dirt is a way of establishing our character and social position.

Class and Dirt

Dealing with waste as one's primary task is polluting in itself and indicates low status. Scavengers and junk dealers are never quite respectable, even when they earn substantial incomes. Who would hesitate when asked to rank a farm worker against a garbage collector, and yet the latter is the more skilled job. In defense, garbagemen give themselves new labels, such as "sanitary worker," but the names are transparent. A gala banquet was held in Beijing for the best street sweepers. The deputy mayor assured them that "all work is worthy of pride. . . . You take on the dirtiest work so that millions can enjoy a clean environment," and so their social position was underlined once more. Contrast this picture of the garbage collector with our images of truck drivers or carpenters, or even



2 The garbage collector and junk dealer are not respected because they handle the wastes we fear and despise. *(The City of New York Department of Sanitation)*

rug cleaners, window washers, and plumbers (although it is true that those last are also a little too close to the sewer). We are uncomfortable because we depend on these specialists in skills we abhor and fear they may rebel. It is reminiscent of the endless discussions of the "servant problem" in middle-class households not long ago.

The image of waste is a powerful motif in Friedrich Engels's famous analysis of class relations in Manchester,[3] and it is frequently the device by which Dickens identifies his characters: the retired dustman Boffin in *Our Mutual Friend,* or the evil ragpicker Krook in *Bleak House.* The ascription of class may even overshadow the function, as in this quotation from V.S. Naipaul:

> Study the four men washing down the steps of this unpalatable Bombay hotel . . . After they have passed, the steps are as dirty as before . . . They are not required to *clean.* That is a subsidiary part of their function, which is to *be* sweepers, degraded beings, to go through the motions of degradation . . . Cleaning the floor of a smart Delhi cafe, they will squat and move like crabs between the feet of the customers, careful to touch no one, never looking up, never rising.[4]

And so, in our urgent need for order and clarity, we find change and gradation hard to bear. People, things, and places must be one or the other, there to remain—not shifting, not in-between, not partly so and partly not.

Cleaning: Personal and Ritual

Animals spend substantial time in preening, grooming, and cleaning the nest site. Among the social animals, much of this elementary behavior has been appropriated for the communication of appeasement, courtship, and social bonding. In the same way, a good percentage of our human day is spent in cleaning—washing our bodies, cleaning food and removing its by-products, cleaning clothes, cleaning house, grooming self and grounds. Some of these activities have also been transmuted into social symbols, or elaborated in religious rituals of purification. Disposing of waste may be thought demeaning as a principal occupation, but the act of cleaning—the initial separation of waste from good—can be respectable and even enjoyable: taking a shower, for example.

Cleaning can be a joyous communal event. It can be used as a symbol of mutual reassurance and affection, as among the social animals. Whether the work is hard

or easy has little to do with this psychological reversal. We admire a difficult cleaning skill, as when we watch the sandblasting of a building, or the crushing of old cars into dense bales of metal. Our satisfaction is enhanced if the waste, once concentrated, has some further utility as compost, fuel, fill, or scrap.

Cleaning is a sacred vocation when it is undertaken in the preservation of holy places or holy texts against corruption and decay. Classical scholarship has as its whole aim the recovery of old texts that have come down to us as misshapen fragments. It is a lifetime devotion to purity, to the continuous disposal of verbal waste and error.

Cleaning can also be a dramatic ritual. The Incan feast on the first new moon in autumn was a festival of purgation. The people made a special bread of corn and human blood. Before dawn, they washed, shook their clothes into the street, rubbed themselves and the threshold with the new bread, and left it outside with all their ills. Four men carrying lances met at the city center to carry the disease away. They ran along the four main roads of the city, and then other runners in succession carried the lances five or six leagues out of the city, where the last warrior plunged it into the ground, nailing illness to the earth. At night the ceremony was repeated with torches, which were extinguished in distant streams, to carry the ills out to sea. The purified city and people then held a great festival.

The Shakers had a rite called the "cleansing gift." Collecting every piece of waste, even twigs and tiny scraps, sweeping inside and out, they tidied the landscape for a holy visit. Roaming singers entered every building and yard, to encourage the cleaners and to search for dirt and evil. In Oneida, another utopian community, when members returned from a permitted visit to the world outside, they were subjected to purifying rituals, including a community steam bath and a session of "mutual criticism" reminiscent of China's "Cultural Revolution." (During that frenzy, one daughter of a suspect Chinese intellectual family volunteered for the task of collecting manure "in order to struggle against her capitalist vanity and capitalist fear of filth.") Thus in many cultures religious and political rites of purification have appropriated the homely models of scrubbing, sweeping out, and vomiting.

More often, cleaning is laudable but laborious, a stubborn defensive action: sweeping or scrubbing the floor,

dusting, washing windows, raking the lawn, doing the laundry or the dishes. To perform these tasks occasionally demonstrates social responsibility and egalitarian principles. Done for a living, it is menial labor. Much of it is women's work, of course. Would giving dignity to cleaning support gender equality, or vice versa?

Cleaning unsupported by ritual is a burden, especially when cleanliness is not the outcome, or it quickly lapses into impurity. We accept baking or weaving or woodwork as interesting full-time occupations, but not continuous cleaning. Repetitive productive labor is noble labor, but the endless removal of some unwanted thing is only wearing. If only the final state is what is valued, and if that state can be achieved only momentarily, then cleaning is hopeless catch-up. In a society where essential food, shelter, and clothing are assured for most, and where the volume of material consumption is high, much of the anxiety that once focused on eating or keeping warm is transferred to moving the waste along. Garbage and trash removal become "difficult" public functions, apparently always on the edge of breakdown. What to do when the garbage trucks stop is a greater conscious worry than the cutting off of water, food, or electric power, even though the first two would have much more serious consequences, and the last in fact fails more often. The accumulation of garbage during a strike is always good for national, or even worldwide, headlines.

Junk, Antiques, and Relics

Second-hand things are for the poor, unless the things are old and scarce enough to be antiques. Second-hand stores occupy dilapidated buildings in marginal locations. Things made from re-used material—such as recycled paper or rebuilt mattresses or tires—have a bad image. They are not fresh or virgin, the sexual metaphor of exclusive possession. They seem unclean, grey, a little greasy. Who would trade new lumber for old boards, except an experienced carpenter, who knows the effects of seasoning? Few recycled products escape belittlement, and "100% rag paper" is an exception that proves the rule. Children love to rummage in trash and bring home strange objects, but their parents warn them of the dangers of this degrading activity, and promptly rediscard the junk. It is a standard childhood lesson, like not playing with feces.

True antiques are things that have never been discarded, but have been continuously used and continuously

3 When a London bridge, built in 1831, had outlived its usefulness in London, an American developer purchased it and shipped the 10,000 tons of stones to the desert of Lake Havasu City, Arizona. It was reconstructed as a tourist attraction on the site of a World War II landing strip. Water was diverted from the Colorado river to flow under it. *(UPI/Bettmann Newsphotos)*

maintained. As these true antiques become scarcer, however, there are successive waves of enthusiasm for particular classes of old objects once routinely discarded: old tickets, old bottles, cast-off clothing. To be attractive, these things must be connected with previous human use, but not so closely as to have any association with filth or rejection. They must be clean and distinct. In addition, they should exhibit a variety of form about which taste can be selective and around which connoisseurs can elaborate a web of values.

Saints' relics are sanctified bits of dead bodies. Wars were fought for them; they were the glory of towns and cathedrals. Periodically stolen, they were carried great distances to be worshipped at some new holy place. The bridge discarded in London and re-erected in the Arizona desert as a tourist attraction is a wry contemporary parallel, a holy relic removed to a new center of power.

Useless junk in random mix can suggest new forms while retaining the pathos of old meanings. It is as plastic as fresh raw material, yet full of hints and suggestions. Many artists use scrap material; some build great monu-

ments of it. Simon Rodia's Watts Towers are cherished in Los Angeles. Clarence Schmidt built a three-acre sculpture on Ohayo Mountain, using some 300,000 discarded objects set in asphalt and concrete.[5] This monument of trash was disliked by his wife and hated by his neighbors, who finally destroyed it. Yet it fascinated children, for whom it was a rich and moving world. In secrecy, Nek Chand, a worker in the maintenance yards of Chandigarh, created his astonishing rock garden out of broken fixtures and ceramic tiles. When they discovered it, officials wished to clear it away; happily they failed.

See figure 72

But clutter, seen as a problem, may be a new phenomenon. There are compulsive collectors and compulsive ejectors. Some do it with style; some are near to drowning. Eccentrics fill their dwellings to the ceilings with trash, and creep through the tunnels in the waste. When things get very old, they do indeed have a special aura. But some people collect and display objects of moderate age, chosen at random. Thus they create an "interesting" atmosphere, and make sentimental accommodation to the phenomenon of loss. These are collected objects and not their own wastes, impotent fragments from some unknown continuity. Others feel threatened by dying commodities. Things are moved to disposal as rapidly as possible, yet

4 The garden of the Bulwinkle house in Oakland is a fantasy of birds, flowers, and other things fabricated from scrap iron. *(© Kimberly Moses)*

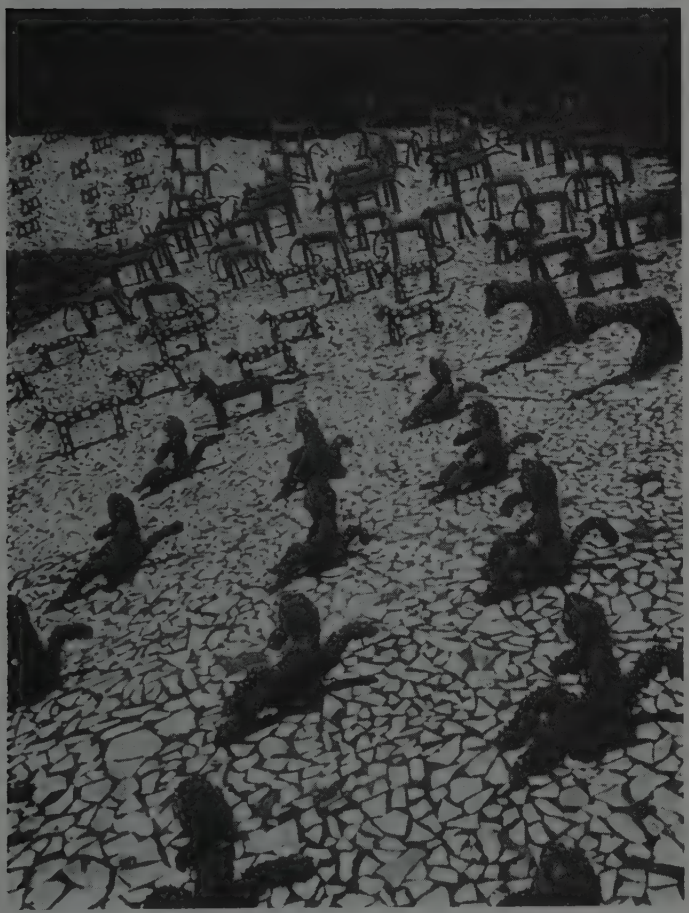
5 Simon Rodia's Watts Towers, built of scrap material, became a Los Angeles landmark. *(© Wayne Andrews/Esto)*

they accumulate incessantly. This group is in a constant state of alarm, of object warfare. A third group is in firm control; *their* houses are disciplined places. Anything that is not well-functioning is immediately excluded. Nothing piles up; all things work; they mean just what they do, no more. But all three groups agree that things "pass on," and that in doing so they have a peculiar power that must be dealt with. None of them are quite at ease with that continuous flow. All three are troubled by the death of things. The protagonist of *The Immoralist* is frantic to stop the decay of objects. "The very dust of the air one breathed came from the horrible wear and tear of material objects. . . . Things stained were things touched by

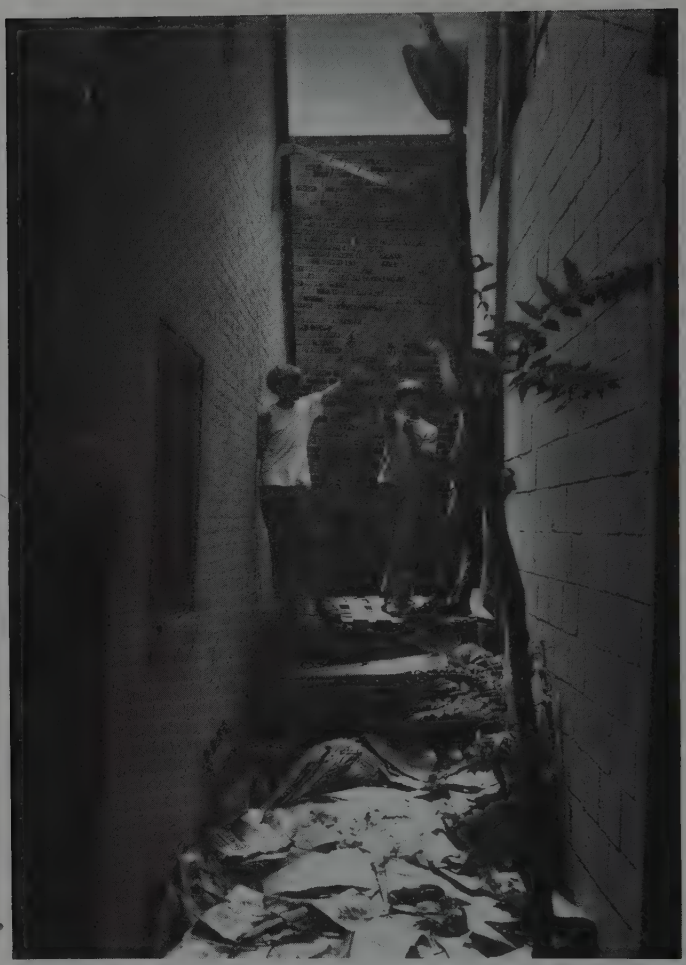
disease, with the mark of death on them." But after himself encountering death, he becomes an "immoralist" who gives up self and things, and even allows his wife to die of consumption, a "wasting" disease.[6]

Abandoned Places

The abandoned city is a stock image of science fiction, a place of terror and degeneracy. This does not entirely ring true, since living among ruins has its delights. Useful material is abundant: walls, roofs, pavements, metals, pipes, glass, machines. It can be a wilderness more wild



6 Nek Chand made his renowned rock garden in Chandigarh of discarded toilets, glass, ceramics, and rock. Built in secret over 12 years on a deserted plot of government land, the 12-acre garden is peopled with 20,000 fantastic figures and forms. Today the garden receives more than 2,000 visitors a day. *(Azid Hind Stores)*



7 Children and teenagers are attracted to out-of-the-way places that are screened from public view and control. *(© Michael Southworth)*

than any natural one, an alluring mix of freedom and danger. At the same time, the ruins retain their evocative, symbolic power. Time past can be reconstructed in imagination. Anais Nin caught those feelings in describing an empty city: "It was a city rendered into poetry by its recession into the past, as cities are rendered into poetry by painters because of the elements left out . . . it had to be constructed anew by each person." E.M. Forster comments on his visit to the ruins of an old British cantonment in India: "A civilization, however silly,

is touching as soon as it passes away. . . . [I] wander through ruined halls of bungalows that once smelled of whiskey and echoed to giggles."[7]

In abandoned places, the release from a sense of immediate human purpose allows freer action, as well as free mental reconstruction. In Nin's tale, the principal remembers the delights of childhood play in an abandoned, partly excavated subway, "a city beneath the city," which their parents had forbidden to them. The children brought in mats and candles and lived a secret life there, more intense than normal. It was a thrilling and a dangerous place. One risked being lost from the world above.

George Orwell's famous description of Wigan, a burnt-out town of England's Industrial Revolution, conveys his disgust and yet also his fascination. First he describes "a squalor that would be impossible even in London," and then his style shifts and becomes more vivid: "the drifts of smoke are rosy with sulphur, and serrated flames, like circular saws, squeeze themselves out from beneath the cowls of the foundry chimneys . . . You see the fiery serpents of iron being hauled to and fro by red-lit boys, and the scream of the iron under the blow."[8]

Many waste places have these ruinous attractions: release from control, free play for action and fantasy, rich and varied sensations. Thus children are attracted to vacant lots, scrub woods, back alleys, and unused hillsides. Wallace Stegner recounts the beauty, mystery, and pain of what he found in the rural dump of his childhood: the discarded volumes of Shakespeare, the skeleton of his own pony. The dump was a history of his settlement, a source of treasures that he rescued only to see them returned by his family: "I learned more from that dump than I did from school."[9] The important lesson was the pioneer ethos: how to leave things and places behind. Adults, more inhibited by accepted ideas of beauty and value, will nevertheless also enjoy visiting a well-managed local dump or an established ruin. What Denis Wood calls "shadowed spaces"[10]—those screened, marginal, uncontrolled places where people can indulge in behavior that is proscribed and yet not harmful to others—are regularly threatened by clean-ups and yet are a necessity for a supple society.

Other waste places are too dangerous, or lack appeal because they cramp free action, or provide nothing for the

8 Sixty per cent of Hiroshima was destroyed by the atomic bomb. In 1946, one year after the atomic blast, little attempt had been made at reconstruction because of radioactivity and building materials were not available. An estimated six to ten thousand bodies were still buried in the ruins. *(UPI/Bettmann Newsphotos)*

imagination, or exhibit few human traces. The littered, empty, asphalt-paved and cyclone-fenced industrial yard is one example; the barren, paper-strewn roadside another. These are not wastelands as much as empty, single-function places. The landscape of the nuclear holocaust stands for an extreme example: inescapably deadly, empty of life and movement, and utterly meaningless since there would be no one left to whom to mean. By negation, these places epitomize what makes some waste places a pleasure: rich form, freedom, and a sense of continuity.

Backsides

Even simple shabby places have their charms. Buildings have a front side and a backside, despite the efforts of architects to convert them into sculptures in the round. In cities, there are modest, dowdy places behind the imposing districts. The proper, formal locales are well ordered and controlled, while the more careless, informal "backs" are used by the familiar few. In the latter, things are not set out in order nor kept presentable, because their uses have well-developed schemata of their location and function. Here many objects are passing on their way to extinction. And just because of the naive connection to function and personal use, backsides are highly expressive. Since there is little pressure to control the display, much material is exposed to our attention. Planning professionals know that these are the places to observe if one wants to come to know an area: walk the alleys, look into the backyards, peep into the depths of the small street-corner shops. Shabby, ordinary places escape the weight of power, the intent to impress; they are liberated zones. They relieve us from the necessity of calculated communication and behavior. Not that they lack meaning—far from it—but they have the simplicity and ease of well-settled custom and familiar use. In many famous cities, the backsides are not only more revealing to the inquiring eye, but offer more enduring delights, once we are no longer tourists.

See figure 42

Analogies to the pleasures of ruin and backlot are subtly present in some fine natural scenes. The "immemorial brook" is a pleasure to watch for its very lack of immemoriality. It has long been running, and will do so for years yet to come, but its essence is a wearing away, a downward flow. Its fascination lies in the contrast between the stones and the running water, the stillness and the flow. In motion it remains in place, and yet it cannot forever remain. Similar pleasures attend the contemplation of other recurrent, visible wasting: the surf, for example, or a fire. Fire is such beautiful decay! Japanese artists and religious thinkers, under the influence of Buddhism, have long celebrated transience, declaring that the essence and beauty of things lies in their perishing. "The most precious thing in life is its uncertainty."

Loss

Environmental loss can be remade into a poignant memory. W. H. Hudson recalls the bird-haunted marshes of the Argentine pampas that later were levelled for farms:

> When I recall those vanished scenes, those rushy and flowery meres with their varied and multitudinous bird life—the cloud of shining wings, the heart-enlivening wild cries, the joy unspeakable it was to me in those early years—I am glad to think that I shall never revisit them, that I shall finish my life thousands of miles removed from them, cherishing to the end in my heart the image of a beauty which has vanished from the earth.[11]

Even so permanent and so destructive a loss has become an evocative memory.

Historians of landscape architecture lament that gardens do not last, yet buildings do. Gardens depend on constant maintenance; they are easily remodelled and quickly abandoned. But it is this very impermanence, this dependence on constant care and use, that is their finest quality. While they exist, they are wanted. In their years of reversion to weedery, quite unlike an empty building, they speak at once of old loss and new life.

We differ in the degree to which we can endure or enjoy such change. Some see beauty in patina and rust; others feel it is a terrifying diminution. Environmental stability is important for everyone. Old people turn to the environment for a sense of connection as their friends die away. The very young need stable places, too, as they struggle to order and identify themselves and their context. Those under stress—the mentally ill, for example—are making the same effort. Adaptability is a state of mind: a willingness to accept change based on the confidence that one can act and choose in any likely future circumstance. A similar confidence must underlie our perceptions of wasting.

Consumption

In economics, consumption is that use of goods that results in a loss of their utility. It is the legitimate, universal process of ensuring survival and satisfaction, which must be balanced by a continuous production of new utilities. Economists see all human behavior as contained within this duality. If the two are not in balance, the market will impose a balance, harshly if necessary. This economic view may be a narrow view of society, and surely it is a man-centered view of the world, but it bears a resemblance to the directed flow of matter and energy. Unfortunately, it carries some common prejudices on its back: production is laudable but unpleasant, consumption

is pleasant but deplorable, while removing the by-products is both unpleasant and unproductive. An excess of consumption is the path to disaster; an excess of production is wasteful but not fatal. Well-being is increased consumption supported by increased production. The one pays for the other, and the more we put through the system, the better off we are. These are the presumptions that have begun to conflict with our deep-seated fears about wasting things.

Consumption is epitomized by eating. We take things inside of us, break them down, appropriate parts, and reject the rest. Eating is acquiring things, by force if necessary, enveloping them, passing them through our power. Once consumed, a thing is useless and powerless. Still, if its malice survives, it can mount a dangerous attack from inside. It is material polluted, despised, left behind. Eating is a biological necessity and a lifelong pleasure. It is also gluttony and aggression, and few people do it gracefully. Eating, drinking, smoking, and talking are principal social occasions. The act of drinking is a symbolic social gesture, smoking can be elegant (if deadly), and talking should be visibly attended to by the polite observer. On the other hand, it is *not* gracious to watch people closely while they eat. Eating is hedged with formal rules; its etiquette is formidable. For the fastidious Balinese, eating is as disgusting as defecation. They eat hurriedly and in private. The Pythagoreans taught that the animals on the moon did not eat or excrete, but lived on diluted heatstuff, air, and water vapor. Thus they were bigger, stronger, and more beautiful than animals on earth.

Excreting

Excreting is also a pleasure, if less discriminating than eating.[12] But this is a shameful pleasure, enjoyed in private, an obscenity to mention. Toilets are dangerous and solitary places, while restaurants are social centers.[13] To connect excretion with eating, or with sex, is truly disgusting. Toilet training is a lengthy process for us, on which much social energy is focused. It inculcates shame, imposes awkward clothing, and leaves us with painful memories of those embarrassing accidents brought on by carelessness, fear, excitement, or the excessive distance of a toilet. We are told that this indoctrination affects our character. In a recent trial, a mother was accused of the third-degree murder of her child, whom she beat to death while attempting to train her to the toilet. This mother

kept a very clean house and had been unusually careful of her child's health. Other mothers were rightly shocked, and yet said that they could understand that senseless anger!

Stephen Greenblatt contrasts the attitudes of Rabelais, Thomas More, and Luther towards excrement and body functions, as a record of the passing of the ambiguous medieval acceptance of death and filth and loss as part of life, and the emergence of a more narrowly ordered European society, underlain by feelings of self-loathing.[14]

At the other end of the life cycle, the incontinence of age is one of its greatest burdens. An old person may adjust to the odor and mild discomfort of urine, but society will not. We tolerate senile mental lapses, and look on confinement to a wheelchair with warm sympathy. But an elderly professor, mentally alert and active in scholarship, who also wets his bed, is simply pitiful. On occasion, individuals must submit to an operation which removes the colon. They must then substitute for this organ by carrying a bag that stores their own excrement. Although this simply makes external a normal body function, it rouses a deep psychological distaste. So strong and so typical are those feelings that a national organization of sufferers has been formed, to help its members deal with their self-revulsion.

Naipaul comments on the Indian blindness to the act of excretion. "Indians defecate everywhere . . . they never look for cover . . . [and yet] *Indians do not see these squatters* and might even, with complete sincerity, deny that they exist."[15] Gandhi made a frontal attack on this blindness. He felt that there would never be any improvement in the lot of the untouchables, and no decline in the incidence of typhoid, unless all Indians learned to handle excrement like the untouchables. He sent his disciples to clean the cowshed and then the outhouse, and so to learn that human waste is "as holy as cow dung," which the Indian culture already valued. He developed a detailed procedure for disposing of human waste in trenches, in order to convert it into fertilizer. When he went walking, he cleaned the path, saying that "removing the excreta of others is a form of communion." He asked soldiers to put aside their arms and clean the country. He linked the treatment of the Harijans (the untouchable caste), to these social attitudes toward filth. The Chinese are engaged in a similar struggle to curb the old custom of spitting on

the street and the floor, since it recirculates viral diseases. But they bring an entire social mechanism to bear on the habit, and that habit is not so deeply seated in the beliefs of the culture. Exhortation, even when uttered by a wise and charismatic leader, does not easily unseat tenacious beliefs, unless it is supported by social action.

We circumvent our own excremental feelings by an elaborate technology which plunges the shit, and the paper used to absorb it and to wipe the body, into a standing pool of water, which is then flushed by a rush of more water into an invisible system of dilute flowing waste. Miles of private and public pipe connect every sink, toilet, and drain to huge treatment plants or distant sewer mouths. These plants undilute what has been dispersed in this torrent of water, or pump it out to sea. So there we have solved the problem. We can cherish our avoidance even while escaping epidemic. But the method consumes enormous volumes of water and can pollute an ocean.

Violence and Control

Consuming and wasting run with violence and control. Maxine Hong Kingston recounts the paranoid fantasies of her Uncle Bin, whose suspicions culminate in the conviction that all the garbage in the city is being collected and saved for *him*. Soon the garbagemen will seize him and force him to eat it all. So he restricts himself to eating things that leave no remainder, so as not to add to his horrifying task of consumption to come. In the end, he returns to China, where the people waste nothing.[16] Bruno Bettelheim writes of the difficulties of dealing with incontinence or supercontinence among mentally disturbed patients.[17] It requires great patience and understanding to bring them to accept their body functions. In *The Midas World,* Frederik Pohl imagines a future society having gigantic productive power, but one convinced that unconsumed production is immoral waste. Consumption is therefore forced, and it is the people of lowest status who must use the most. To rise in the world is to be freed from this frenzy. Is this a forecast of a world to come, or just a reflection of our present uneasiness with consumption?

In real societies of the past or present where material shortage is the norm, discarding things is a notorious way of demonstrating power, as Veblen made so acid clear. Kings built palaces they could not inhabit, acquired more clothes than they could wear, sickened themselves with

food their bodies could not absorb. The risky condition of obesity was a sign of well-being. Lesser people followed within their means, and rejoiced in fat babies. The Kwakiutl potlatch reached its climax when a copper worth thousands of blankets was broken and thrown into the sea. (A "copper" was an etched sheet of native copper used for exchange.) And so the waste space of a front lawn, well tended, never used, or a big, empty office, is evidence of our own social standing.

Joys of Wasting

Wasting can be more than a reinforcement of status, of course. "Trashing" is an undeniable joy. It is a process of making things submit to us, which perhaps was an emotion useful in earlier stages of our evolution. Collision derbies and the art of piano-smashing have many devotees. The sack of a city, that rich nugget of wealth and helpless people, has always been a memorable exploit in the history of war. Its promise kept fleets and armies together, and inspired extensive campaigns. The goods to be acquired were only part of the motive, since most of them were lost in the sacking and the carriage home. What was anticipated was the wild glee of looting, after the months of walking, waiting, carrying heavy weapons and armor, and suffering cold and hunger. The drama of the sack and the tally of the wealth destroyed were what everyone remembered. Contemporary warfare, remote and technical, is not only far more wasteful and dangerous to society, but also less satisfying to the combatant, who has fewer opportunities to trash the enemy.

We like to break things, especially those artificial substances like glass and ceramics that smash so sharply and decisively. We enjoy bonfires, particularly when they consume something we recognize. Seeing a building burn is a shameful thrill, the joy that activates the firebug. We like to watch the wreckers take down a building, especially when the big ball knocks down a standing wall. So our cultural dispositions for violence against persons may be transmuted into violence against things. Vandalism, which imposes such a social cost on us, is driven by this same pleasure. It is a show of power by the powerless.

Sometimes the object of violence is the self. In anorexia, a not uncommon neurosis, the sufferer starves to a living skeleton—even to death—for fear of letting go and gorging. The controls are on or off, without a middle ground, and the organism plunges from one state to its polar opposite. Bulimia is the related illness: the secret wolfing of

food (up to 55,000 calories in a single hour!), followed by induced vomiting or purging by strong laxatives. It is the purgation that brings relief and motivates these violent episodes. Eating, on the contrary, is accompanied by disgust and panic, a neat reversal of our common attitudes. Bulimia is widespread on the college campus: some 15 to 20 percent of college women are estimated to indulge at least once in such wastings.

We have difficulty in consuming in an open way. The Ainu of Sakhalin believe that animals and man-made things have a soul, which after use must be properly released and sent on its way. If not, that soul will become estranged, will linger, and cause illness. In the mountains, a bone pile is established for each animal species, while the remains of sea mammals are put on a hill overlooking the sea, and those of sea birds near the shore. Broken utensils are deposited near the house. Only plant remains, and pieces left over from woodworking—objects without souls—can be dumped without thought. Even the ashes removed when renewing "Grandmother Hearth" must have their own location on the sacred side of the house. Other people, thinking of these same continuities, may act symbolically in quite an opposite way. Marco Polo reported that a religious order on the Malabar Coast in India ate no living thing—not even fresh plants, since fresh plants have souls—but ate dried plant food only. They excreted on the beach, then spread it out and crumbled it into the sand. "We annihilate this substance, so that no worms may be created of it, merely to die of starvation by our guilt and default."

Discarded People

We discard persons, too, once they are of a certain age or degree of disability. At some abrupt point, they are classed as useless, and so class themselves. David Marvin wrote a moving description of his own descent into skid row, so like the plunge into anorexic starvation. Deaf and unemployed, at first he daily looked for work. But when his unemployment insurance ran out, he pawned his hearing aid to ratify his isolation, lived in filth, and turned to cheap alcohol to reach the bottom faster. Later he recovered and examined what had happened to him. But when he lost a lung and his job once more, he committed suicide rather than re-experience that downward plunge.[18]

Borrowing from the vocabulary of wasting, we call rejected people outcasts, dregs, and scum. Free mountain people, living on the wild margins of settled society, are

feared and hated by people of the plain. They are outlaws, fair game, outside the rules. People with mental quirks are immediately classed as pathological, once they are confined to a hospital. People in transition, and so without social definition, are just as dangerous as those marginal people. Even if they are passing through some predictable change, as at puberty, that transition must be defined by special rites, typically those of symbolic death and rebirth.

Death

Wasting includes the death of persons and has engaged human thought and feelings for millennia. Our emotional concerns spring from a fundamental biological conflict. The death of individuals is a device for ensuring the survival of a genetic pattern by affording repeated opportunities for adaptation of its carrier to changing circumstances. But we are also conscious of time and personal identity, a consciousness that has other biological advantages. So the thought of death is painful. Dealing with that agony has matured many systems of belief.

There is early evidence of this emotional tension. The paleolithic dead were ceremonially buried, adorned with flowers and cosmetics, in ritual positions and in ritual locations. There is speculation that the cultivation of burial flowers might have been the first steps in agriculture. Death rites may well have produced the first symbolic spaces, even the first cities, which were primarily religious centers. Certainly, the thought of death gave rise to the great intellectual edifices of religion. Religious rites may have been a seedbed for the development of language. Death has been a great teacher.

The rites of death have a dual purpose: to deny the extinction of the individual—to revitalize him—and at the same time to send him on to his proper place while warding off his jealous anger against the living. Red ochre symbolized the blooded, living skin; food and equipment were placed with the body; the body itself was often put into the fetal position, to symbolize rebirth. In sophisticated cultures, mummification, amulets, or magical jade armor assured eternal life. At the same time, the body might be bound, to prevent vengeful attack on the living. Spells and wakes protected the survivors from the angry ghost, until it chose to leave. The funeral was a public mourning, a release of private emotion, a reassurance of esteem to the jealous departed, and a recognition

of her status. There is a ritual journey to the place of disposal. Further magic is performed to assure safe passage to the land of the dead, and no return. Postfuneral rites release the continuing grief, avert ghostly malice, purify the community that has been polluted by death, and reassert life. There may be succeeding rites on special anniversaries, or permanent ancestor worship, or even the deification of the dead.

In some cultures things are deliberately wasted with the body: buried, burned, or broken to release their power and make them unusable to the living. These things die with the person (and thus create the source material of archaeology). The sense of death pollution is illustrated by a Chinese funeral in America. The clothes of the dead man were burned. Friends at the funeral were reluctant to carry the coffin when it was discovered that there were insufficient kin to lift it. The bearers' gloves were stripped off and cast into the grave. A fire was lit before the house, to ward off contagion or perhaps the ghost.

9 The Ifagao of the Philippines placed the corpse in the death chair beneath the house in public view for up to 15 days. Those who had died from natural causes were treated with great care and respect, but those who had been murdered were neglected to make the soul angry and vengeful. *(Roy F. Barton, Lowie Museum of Anthropology, University of California at Berkeley)*

Dead bodies are buried, although some cultures favor cremation or dismemberment (which are methods of preventing return), or even exposure as carrion. The latter custom, so repellent to us, is justified by the Parsis, for example, as a way of preventing pollution—whether of the air by burning, or of the earth by burial. Certainly, it is the most open return of the body to the organic cycle.

The dead person may go to a weak, shadowy afterlife in dust and darkness, or may await future resurrection with a body remade. Or she may be an incorruptible spirit encased in a decaying body, destined to live a disembodied afterlife, free of the evil weight of matter. Buddhism contributes the most philosophical idea: an ascent or descent of the soul through cycles of individual existence—up or down according to the merit acquired in each life—until one is at last received into eternal unity. This could be a symbolic image of the ecological cycle, ending, as entropy increases, in universal heat death. The acceptance of individual extinction, perhaps first formally achieved in the Buddhism of the sixth century A.D., is a relatively recent human idea.

The denial of death can be carried to astonishing lengths, as in the magical practices of Taoism, or the tenets of Christian Science. The Egyptians embalmed the wealthy and powerful so that the dead might continue to make use of their preserved bodies, furnished them with elaborate grave goods, and interred them in great cities of the dead, whose construction, maintenance, policing, and "perpetual" rituals were achieved at such enormous cost to the living. Without any ability to mount this display, the ordinary citizen had no hope for continued life. As one might expect, such concentrations of valuable waste attracted parasites and predators: ritual priests and grave robbers.

Death may be deified rather than denied. The Hindu goddess Kali, the dark, destructive earth mother, is the reversed aspect of the goddess Devi, tranquil and protective. Kali is pictured as a naked hag, baring her teeth, holding weapons and a strangling noose. She is smeared with blood and garlanded with skulls and severed hands. Thugs and highway assassins worshipped her and offered her their victims, and mystics worshipped her as the supreme goddess of creation and destruction joined together.

In the early Middle Ages, the prevailing European view of death was one of passive resignation to a common

10 In Hindu mythology Kali is regarded as the goddess of death and destruction. She holds weapons and is adorned with a garland of skulls and severed heads and hands. *(J.B. Khanna & Company)*

fate. Dying was a public surrender to destiny, in a ceremony managed by the dying person. The dead were buried among the living. As life became more tolerable for some, and heaven and hell less certain, dying was no longer so easy. Death became a tense, dramatic transition to eternity, a separation difficult to accept, which had to be supported by elaborate funerals, impressive cemeteries, and violent grief.

Today we move closer to a denial of death, a suppression of visible grief and of the signs of mourning. The

old, the dying, and the chronically ill are placed in hospitals out of sight. Cemeteries are relocated to distant locations and carefully landscaped. Dying is no longer the business of the dying person, nor even of close relatives, but is in the hands of specialists: doctors, ministers, and undertakers. (The parallel to our current attitudes about wasted things is striking.) At the same time, there is a revival of spiritualism, of necromancy (magical communication with the dead), of embalming, and of "perpetual care" in the cemeteries. The latest advance is the deep freezing of the dead body, in the hope of future revival and cure. When one such operation went bankrupt, losing its electric power and thus refrigeration, there was a frantic search for relatives to take care of the decaying corpses.

Three contemporary sources for the fear of death—religious belief, separation from other people, and the loss of self—have been identified by Lisl Goodman in the course of numerous interviews.[19] The last was the most difficult to bear. Among the people she talked with, it is those who feel that their lives have been fulfilled who do not fear dying. The termination of an incomplete or aimless life is the one that causes grief. She urges us to take in the thought of death, since it is death that enhances life. She even suggests that we reckon our age by counting backward from our probable time of death: 14 days until Christmas! (And if one lived beyond one's time, would one then become ageless?)

The death of higher organisms, like their birth and maturation, is a gradual process. A good death is a dignified and dramatic event. It requires acceptance and some degree of control, a knowledge of how to close the drama effectively, of how to retard or hasten its onset. It gives each participant a socially approved way of expressing inner feelings while sensing the support of others. The passage is marked out, made memorable, invested with meaning. Protagonists gain a sense of control or at least of participation. Grief is managed by imposing stages of funeral observance that mark a progressive return to normality, and within which disorientation and fear are slowly dissipated.

Constructive Waste

Waste management might learn from these rights of death, which have been so richly embroidered to deal with loss and the threat of pollution. Loss can be life-enhancing if it is an accepted fulfillment. Art can mediate

between the flux of life and our craving for eternity: esthetic sequences culminate in fitting endings. In more homely experience, we admire the sunset or the autumn season, when day and summer stand quiet at the last.

Wasting can be a constructive act. We are pleased when we lose weight, boil down a fine sauce, clean out the underbrush, subsume complex evidence under a simple theory, edit turgid prose, or cut away a stone to reveal the hidden form. Paring down can be an esthetic ideal, and simplicity the goal of science. *Wabi,* in the Japanese tea ceremony, connotes simplicity and quietude, and encourages the use of rough or rustic objects. But these simplicities are very different from primitive simplicity. They are a willful exclusion, a cunning and considered conveyance of multiple meanings by an apparently effortless, even childish, means. Such advanced simplicities demand sophisticated techniques and strong control. The quiet, almost empty, shop on the fashionable street must be supported by money, skill, and much backroom service. Esthetic refinement is a torrent of not doing, saturated with delicate hints. Perhaps the same can be said of religious simplicity. Giving up one's goods on entering a monastery, or the public burning of luxuries, presupposes the ability to waste. Renunciation is complex and painful liberation.

Cleaning and disposal promote health and good function and are also social symbols. These symbols can be so deep-seated, or so closely linked to other social concepts, that it is disturbing to tamper with them. Yet, as situations and societies change, feelings about wasting can become seriously inappropriate, and lead to depressing mismanagement. Catastrophic wasting is usually ascribed to some external cause: fire, flood, plague, or the attack of a distant enemy. But by now it is clear that *we* are the wastrels of the world, the chief expediters of matter and energy. The devils and ghosts are inside ourselves.

Wastes are now more complex, the signs of danger more subtle, or reversed. Nauseous garbage makes fertile compost, yet a clean radioactive container remains deadly for centuries. As material production and population rise, our wastes increase and become less easy to break down, some raw materials become scarcer, and space for disposal is harder to find. The new methods of waste disposal that then become reasonable may seem very unpleasant to old habits of mind. Intellectual and

ethical changes also drive us in new directions. We are more concerned with the smooth functioning of the ecological system, and less comfortable with consigning others to despised roles.

New Attitudes

The problem is dual: to learn new attitudes toward waste, and to invent new techniques and rituals so that attitude and action support one another. Effective disposal is important to our survival. It could also be shaped to make wasting a pleasure and a fulfillment, an enrichment of the person. Some of our habits of thought are obstacles to easy management. We avoid the subject, acting like those who close their eyes and scream when most in danger. We face death reluctantly, and abhor decline. We wish that things were pure and would last forever. We fix on consumption as the measure of well-being but dislike its consequences; we emphasize creation and despise waste things and places. We think by means of dichotomy, in sharp classes, and cannot comprehend continuous flow and gradation.

Other feelings might be pressed into service, just as human, if not so clearly expressed or highly esteemed. There are the pleasures of cleaning, reuse and repair, and the ritual value we place on it. There is our interest—somewhat shamefaced, it is true—in junk, ruins, waste lands, and backside places. Ambiguity has its attractions for us: in humor, in poetry, in voice and gesture, in the suggestive line. Although ambiguity warps our patterns and blurs our fine distinctions, it also suggests new structures, and we are structure-making creatures. Wastes are respectable when they become antiques, or wilderness, or the material of archaeology. But the pleasure of excretion, so well suppressed in early training, is not respectable, nor is our repressed delight in smashing up. Still other pleasures of loss or abstinence are more laudable, such as the sophisticated simplicities of esthetics, science, and religion. The long human meditation about dying well is invaluable wisdom, and so are the more recent scientific concepts of dynamic state, of flow and cycling.

Real dangers must be identified, and negative feelings attached to those real dangers. Inevitably, we are pattern- and distinction-making creatures, but we are not committed to maintaining fixed ideas of purity and value. As we have said, we have two metaphors for wasting, both intimately connected to our own bodies. For short-run transformation, we think of eating and excreting, actions

associated with pleasure, but also with greed and shame. For long-term change, our minds turn to dying—to its griefs, fears, and transfigurations. Could other metaphors, also based on our own biology, be used to make us comfortable with continuous flow: breathing, sleep and wakefulness, growing up and aging? Thoughts of eating and dying strike more deeply, perhaps. Our feelings do not easily switch on and off. But objective processes and ceremonies of transformation could be managed, on that base, so that rational action and inner feelings came to match. Can we accept that we are part of a universal wasting stream, and see in that our place and our connection? Breathing in and breathing out, we would find our identity in the flow of things around us. Cleaning and repairing and passing on the world might become as important as using or making it.

CHAPTER TWO

The Waste of Things

Waste in Nature

WASTING PERVADES THE living system. Organisms appropriate substance and energy, use what they need, and then expire or dispose of what they cannot use. They eliminate through the skin, the alimentary canal, the lungs, and the kidneys, and by shedding, exudation, segregation within the body, or death. The waste products become the food of other organisms, and so matter cycles and recycles, while energy is gradually degraded to dispersed heat.

Predators live by eating other organisms. Saprophytes live on dead or decaying organic matter; coprophytes live on excrement. The hippopotamus eats huge volumes of river fodder, for example, but he is a very inefficient feeder. His feces are a concentration of bypassed food, and many marine organisms depend on him. When army ants are on the march, cutting a swath through the jungle, they are trailed by "ant birds" and "ant butterflies." The birds feed on the insects flushed out of the leaf litter by the advancing ants. The butterflies, who obtain their energy from flower nectar, need nitrogen for reproduction. So they in turn follow the birds, to feed on the dense trail of their droppings.

To take a more general case, sea life is most abundant near the coasts, where wastes are washed off the land, or at places where there is an upwelling current, which transports organic wastes from the depths. Elsewhere, sea wastes soon fall below the surface, far from the level of warmth and light where photosynthesis occurs, and so are no longer readily available for reuse.

Organic wastes thus collect unused in the ocean depths, and also to some degree in the anaerobic conditions of a swamp (whence oil and coal), or in great dryness. Over 100,000 tons of guano accumulate each year on the islands of Peru, deposited by the sea birds feasting on the rich sea life of the coastal waters, which itself depends on an

upwelling current of waste. The great heat and aridity of those islands mean that little nitrogen is lost to the air as ammonia. When first discovered, this mine of valuable fertilizer lay in deposits 100 feet deep.

Nature is prolific in dying organisms, in the waste of seed. Species that occupy stable habitats emphasize competitive efficiency, longevity, density control, and successive broods of restricted size. Those of unstable habitats, on the other hand, favor explosive growth, all-out breeding, and brief life. A population crash following on the overrun of a habitat, or the appearance of a new predator, is not uncommon, nor is extinction of a population, or even a species. Except in the last case, the waste of life enables a continuous, but slowly adapting, genetic pattern to be maintained in the face of uncertainty.

Destructive Waste

Blocking the organism's elimination of waste will destroy life as effectively as cutting off the waster's food, air, or water; and accumulated wastes can destroy a community. Aging is the cumulative loss and disorganization of important large molecules, such as proteins and nucleic acids, or an accumulation of abnormal products. In the so-called "storage diseases"—at present hereditary and incurable—the body fails to break up complex, but no longer useful, materials. There is an accumulation of "chemical garbage," such as fats and sugars. Autointoxication may also be caused by house dust. As indoor dwellers we are subject to this dust, 60 percent of which is dead human skin, a frequent cause of allergy since it is a human product but not our own.

Pollution occurs when the nutrient cycle is disturbed: when waste products are introduced that by their type, or their rate of production, cannot be used by the organisms that are present. Most creatures produce wastes that may be poisonous to themselves or even to others, and so can disrupt the wasting cycle. Man is unique, because he makes substances that are poisonous to *all* living things, including himself. We are further distinguished by the quantity of waste material we spew forth, and by its novelty. Waste-decomposing organisms may not be able to match the rate of production, or cannot evolve quickly enough to find a use for the new compounds. Environmental change in the human settlement is part of the entire ecological system, and it follows normal patterns in many ways. But human wasting is unusual in its abruptness of disposal, the heavy concentrations of waste material that

11 Garbage clean-up in downtown New York in the 1890s. *(The Bettmann Archive)*

accumulate at points of blockage, the rapid degradation of energy, and the frequent loss of continuity.

Filthy Cities

The cities of the past were filthy. They sat in their own wastes, which gradually rose around them. The streams, ditches, and pools used for washing and drinking were unclean. The air was full of smoke and foul odors. In contrast, rural areas were relatively free of human waste, except in the immediate vicinity of dwellings. The daily wastes of city life were dumped directly on the street, to be scavenged by pigs or to accumulate until some heavy rain washed them off. The first drainage systems were storm drains, not waste sewers, and were meant to keep the streets from flooding.

In medieval London, wastes were illegally placed in those street gutters, and flushed away when downpours occurred. The privy vaults under the houses were cleaned periodically, and their contents carted off to surrounding farms. The favored locations for upper-class houses were along the Thames or other streams, because there the privies could directly overhang the water. The city streets near the Thames were cleaned more regularly,

since it was more economical to cart the dung and garbage to laystalls at the riverside, and thence to barge it to market gardens in the valley.

The water closet, originally an upper-class luxury, came into more general use in the late 18th century, when water was piped into many houses. The discharge of these liquids into the streams and ditches, or directly to the earth—in place of the carting off of the privy scourings—triggered a surge in typhoid fever. Citizens were ordered to put all their waters into the storm drains leading to the river. As these drains became foul, they were progressively enlarged, covered, and extended. The Thames itself then gave off a sickening stench, as it received the load.

In 1854, typhoid was first traced to this infected water. As a consequence, covered sewers were connected directly to the houses. Next, the sewage effluent began to be treated, and then the "sanitary" and storm sewers were separated. Our intricate, water-borne disposal systems are the distant, incremental outcome of that first casual use of the street gutter. Each new technical solution led to some new problem, thence to a succeeding solution, and so on to an ever greater consumption of water. Awkward as the system may be, it has made large cities possible and freed them of the recurrent typhoid epidemics that previously decimated their people.

Contemporary Disposal

Bit by bit, municipalities have taken over the provision of clean water, the clearing of streets, the removal of trash and sewage, the regulation of effluents. Progressively, wastes are moved farther from their point of origin (like the leaf-cutter ant, which moves the exhausted remains of chewed leaves, the substrate of the fungus that the ant tends and eats, to a garbage heap at some distance from the nest). City wasting is consciously attended to, and is controlled by larger and more elaborate institutions. Sewer outfalls in California are now seven miles out to sea. Solid wastes are carried well beyond city limits—even into neighboring states. Toxic wastes are exported to "underdeveloped" nations (to speed their development?). The filthy cities of history, which sat in a clean countryside, are succeeded by clean cities encircled at some distance by their wastes.

To cleanse the cities, water carriage and disposal at sea have been increasingly favored, since gravity powers the carriage, water dilutes the product, and river systems are

almost ubiquitous. The dilute mix can be treated to any desired degree, and is subject to bacterial action while in transit. Finally, the ocean seems enormous. Improvement by improvement, without long-range direction, we have built a spendid network of sewers, treatment plants, and outfalls, some of the most expensive equipment required by the modern city.

Water carriage is not inevitable. It is a road taken, the distant result of early efforts to direct surface drainage on the city streets. Dense urban areas in Great Britain may use up to one half of all their available water for sewage. Designating entire rivers as official sewers has been recommended, so that a few others may remain clean. Some urban rivers in the United States are even dangerous to fall into. Thanks to heavy public investment, there has been some recent improvement. Long intercepting sewers have been laid, paralleling the natural water courses, picking up the discharge of the older sewer outfalls. These are the man-made rivers of pollution that run beside their natural twins.

Dilution and Pollution

At some cost, the dilute waste can be treated before it is released, bringing the rejected material back out of solution again. Primary treatment removes the suspended solids, secondary treatment the disease organisms, and tertiary, the dissolved chemical substances that otherwise persist. Tertiary treatment is expensive.

The problem is exacerbated by the old combined sewer systems, in which rainwater draining off land and buildings is mixed with sewage in the same pipe. The surge of flow after a rain then so overloads the treatment plant that untreated sewage must be released; the cost of any treatment rises, since the wastes to be recovered are more dilute. The answer is to install two separate sewer systems, one for polluted water, and one for street drainage. Unfortunately, street drainage can also require treatment, since it may carry oil, heavy metals, and animal wastes. It is the chaotic mixture of our effluents that so compounds our problems.

These "sanitary" systems demand large quantities of clean water, a thousand times the volume of what is being carried off. The great cities reach out farther and farther to collect this magic liquid, and there are recurrent shortages even in the humid Eastern United States. But water is still almost free in most places: delivered pure, under pressure, to any room, far from its source, on in-

stant call with rare interruption, for only three cents a ton. What other commodity can match that? So we waste it.

Waste-water Recycling

Our lavish use of water as universal solvent and carrier is neither inevitable nor very rational. Water can be recycled, of course. Downstream towns may drink upstream sewage unaware. The great hydrologic cycle is itself a vast water purification scheme, and we do not question the purity of a mountain brook. Treated urban sewage is already used for farm irrigation or for industrial process water, and even for recreational lakes. Soon it will be used for drinking, in arid areas, although people will have to overcome some revulsion.

Cholera, typhoid, and dysentery—the historic scourges of the cities and still the savage killers of the Third World—are now rare in the United States. Despite rats and flies, there are few diseases that can be linked to liquid or solid waste in our cities, except for the remaining cases of trichinosis and the scattered cases of contamination by toxic chemicals. Most deaths and disabilities linked to wasting now come from the air, and it is airborne disposal that is most vexing as a technical problem. Clean water is often almost free, but clean air is very costly. Almost nowhere on the globe is the air unadulterated by human effusions. Unlike the water or land, the air has no bacteria that can break down waste products (will they evolve in time, if we keep this up?), so harmful substances can persist for long periods. Indeed, novel irritants and poisons, such as the constituents of smog, can be synthesized aloft under the action of sunlight. Since the air is a continuous medium, well-mixed and in constant movement, wastes are carried for great distances. Cleaning the air the way we might clean our drinking water would be a herculean task, although there have been some recent proposals for releasing aerial enzymes to deal with smog. Thus schemes for improving air purity focus on delivering the emissions somewhere else—by raising stacks or putting them downwind—or on suppressing the emissions before they emerge, whether by changing the process of combustion, or by extracting the polluting substances before they leave the exhaust.

Air pollution became less severe in our cities as the inefficient combustion of wood and soft coal declined, and then worsened again as the herds of automobiles farted out their new hydrocarbons, and the latter combined into photochemical smog. Severe measures, such as curbing

auto use or requiring emission control devices, have so far done no more than check the worsening of air quality. In cities that have failed to act and in those of the Third World, the air continues to deteriorate. Reducing the pollution caused by the ordinary gasoline engine to a truly tolerable level would require having a trailer behind each vehicle as large and as costly as the car itself. Waste treatment at the source, when sources are so highly decentralized, is expensive. New fuels, new vehicles, or new transport systems are needed.

The shift from oil and gas back to coal for heating and industrial processing will cause a resurgence of older forms of air pollution. Pollution has already reappeared in low-density rural areas such as southern New Hampshire, as householders return to their wood stoves. And no matter what form of fossil fuel is used, the locked-up carbon in that fuel is returned to the atmosphere. Aerial carbon dioxide is expected to double in quantity by 2175, in relation to the levels existing in 1800.[1] The effects of this release are uncertain, but are likely to include a persistent warming of the earth, some melting of the polar ice, and a consequent five- to eight-meter rise in sea level, flooding many coastal settlements.

Other uncertainties surround the possible effects of the exhausts of airborne vehicles on the state of the atmosphere, or changes in the way in which that atmosphere blocks or is transparent to solar radiation. Even oak and pine trees have lately come under suspicion of emitting hydrocarbons that contribute to smog! The air is a sensitive and globally indivisible waste receptacle. Many interesting consequences may be in store.

Solid Waste

Solid wastes are dumped on the land or barged out to sea. Sooner or later organic wastes are cycled through the ecological system: the excrement, wood, textiles, paper, food waste, bodies. Other more stable wastes pile up in more permanent form: broken glass, ceramics, stone, mine tailings. Even organic material may accumulate, if it is sufficiently removed from the living system. In the Antarctic, the wastes at McMurdo Sound pile up without decomposition. Litter in orbit around the earth may one day be a nuisance, and the next day, a peril.

The accumulation of human waste is not automatically harmful. Old waste materials are used for new purposes. The giant shell middens (*sambaqui*) on the southeastern coast of Brazil below Rio de Janeiro rise to 25 meters high.

They may represent the refuse of 500 years of indigenous coastal settlement and are now being dug out and burnt for agricultural lime.[2] In New Zealand, the waste heaps of the early goldfields were reworked in the 1870s, first by individual Chinese scavengers, and later by large, technically advanced mining companies. The reworking of old tailings is a familiar story, occurring each time that demand shifts or technology advances.

In the early 1970s, the United States, with 6 percent of the world's population, consumed one-half of the world's production of raw materials and produced 70 percent of the world's solid waste, or some 300 million tons per year, exclusive of wastes from mining, agriculture, and the burning of fuel. But those percentages of world output are now declining, as other nations climb toward our inspiring standards. Wasting by the remainder of the world, at anything like the levels of the United States and Europe, will of course impose a staggering load on the natural cycles.

The champion generators of waste are the military: there are thousands of square miles of wasted war material sitting in the U.S. deserts, and the junk of World War II still litters the isolated islands of the Pacific. Just after that war, one dealer bought 5,000 surplus aircraft, and the remaining gas in their tanks paid for the purchase of the fleet. In war, military supplies are expended lavishly, lost, or misused, and civilian goods destroyed. Post-war spurts of economic growth are often founded on this thorough previous wasting. A look at our national budget confirms that this magnificent wasting still continues.

Disposal

Over one-half of all our municipally collected waste is paper and plastics, most of it discarded packaging. Packaging, which so magnifies the task of disposal because of its bulk and its intimate mixture with decomposable garbage, has its countervailing advantages: convenience, better sales, and the prevention of spoilage and disease. Household waste is rarely separated, but goes into the can in a chaotic mixture. Separation at the point of disposal is then required, if any useful components are to be extracted, or if composting or incineration is to be done efficiently. Householders can be educated to separate their rubbish, but the education requires time and effort.

Airborne waste can be discharged to its long-suffering medium from any point. With or without sewers, waste liquids, however noxious, will run off into streams and

oceans, or soak into the ground. The runoff may have nasty consequences, but at least the stuff goes off on its own. Not so with solid wastes, whose mere collection is as tedious as its proper disposal is difficult. The cost of collecting solid waste is in the range of 2 to 3 percent of total municipal expenditures, on a par with police, fire, water supply, and electric power, but substantially below the costs of streets, welfare, or education. Yet by common opinion it is one of the most intractable of all the service problems. Public cleanliness ranks with safety as a most persistent citizen complaint. In densely populated lower-income areas, crime and litter seem uncontrollable. Even where incomes are high, trash collection is a continuing anxiety.

Inner-city residents complain constantly about the service, while the typical city administration insists that service is as good as it can be, given the lack of cooperation from residents and the pressures of the sanitation workers' union. Collectors and residents are usually at odds. Oversize or broken containers are not picked up. Bags may break and spill. Containers are put out just after the truck passes. Trash on private land is ignored. Who is responsible for collecting any scattered material? Each

12 Awareness of the need to recycle wastes is growing, but it is difficult to accomplish. Effective recycling must start at the source. *(© Kirk Condyles)*

13 Trash is one of the most visible and annoying forms of waste, but unlike sewage, toxic chemicals, or air pollution, it is rarely harmful. *(UPI/Bettmann Newsphotos)*

side may call in the police to force the other to act. The problem is seen as "enforcement," "getting collectors to do their job," "teaching people to act properly." The common undertone is frustrated control. The supply of trash seems infinite, and any improvement of service simply calls forth a greater load. Trash is the most visible and annoying form of waste, but unlike sewage or air pollution or toxic chemicals, it is rarely dangerous. Since the perception of litter is subjective, it is difficult to quantify any achievement in reducing it. The service is painful for everyone.

New York City, which spends more per capita on sanitation than any other major U.S. city—almost double the national average—has a reputation of being one of the dirtiest cities in the world, and it is getting dirtier. Only half of its streets meet standards that citizens feel are acceptable, and in Manhattan, only one-quarter. Budget restrictions have forced sharp cuts in the street cleaning workforce. To make matters worse, productivity is low. Many truck teams work no more than two or three hours per day, in any effective way. Citizens despise them, and so they act accordingly. Citizens take their cues from the litter around them and drop refuse where they please.

It is estimated that there are 40,000 violations of New York's sanitary laws by its citizens *each day*, and this is exclusive of any individual littering. The visible impact is worsened by the lack of back alleys to which trash could be consigned and from which it could be picked up. In the modern city, all the waste is "out front." Replacing the horse by the motor car removed manure from the streets (and added fumes to the air), but today cities are plagued by pet manure along the sidewalks. New York pioneered in enacting a Canine Waste Law in 1978, which requires pet owners to remove the shit of their darlings as it is dropped on the public way. For a time at least, many pet owners did so, to the greater comfort of the pedestrian.

As the number of receiving sites for private dumpers is reduced, illegal dumping is growing. A mile-long ridge of illegal debris accumulated at Coop City—8 to 12 feet high, and 20 feet wide. Deliveries are made at night, often by convoys of trucks preceded by a scout car. It is difficult to catch these dump-and-run drivers in the act. Dirty streets have even become a spectacle for tourists, who gawk at it as if it were the eighth wonder of the world. The Department of Sanitation, according to New York's former mayor Koch, is "the most frustrating agency of all the agencies I deal with."

Despised Work

The lives of the men who work the trucks are colored by their occupation. The work is hard, noisy, and smelly, difficult in the cold. There are many injuries from cuts, strained backs, falls from the truck, or hands caught in the compressor. Sanitary workers have the highest accident rate of any U.S. occupation. Their risk of injury is four-and-a-half times that of coal mining. Young men shy away from the occupation. One older Boston garbageman is proud of his work and feels its necessity, but hopes for better things for his kids. His wife is embarrassed by his occupation.[3]

See figure 2

A despised process, in which despised people handle despised material, seems out of control. Advanced technology will not solve it. The missing element is widespread cooperation and care. Change cannot simply be accomplished by a new machine or a catchy advertisement.

Litter

Littering is the most visible method of waste disposal, and symbolically the most damaging. It bulks small in fact and large in the eye. The cost of recollecting such scattered material is high; it is hand work, scrap by scrap.

14 "The Oregon Trail," Albert Bierstadt, 1869. As pioneers moved west, they left behind a stream of debris—broken wagons, garbage, and dead or dying animals. *(The Butler Institute of American Art, Youngstown, Ohio)*

Littering is constrained or released by social cues. Most people think it blasphemous to drop garbage in a church or on a grave, and ill-mannered to deposit it on a carpet, but give little thought to dropping paper on the street. Whenever the consequences of immediate disposal are remote, either because no one directly controls the place or because one more contribution will not have a marked visual effect, then that is the right time to let it go. The place must also be easy to reach, so that things may be dropped quickly. Litter piles up in the symbolically debased areas of the city, along alleys and back roads where a car can quickly and discreetly discharge its secret burden, or at the edges of untended woods, in vacant lots, wastelands, and derelict industrial areas—even at street corners, which are less visibly controlled by fronting uses, and where the momentary pause of a vehicle seems natural. It is a guilty act: smuggling in reverse.

Since littering is governed by stable social convention, it is relatively immune to the exhortations of periodic "antilitter" campaigns. Some countries, such as the Soviet Union, resort to stern police controls. Litterers are fined on the spot. Another means is to change the environment, whether by increasing the sense of control, by

improving maintenance, or by providing waste containers. Organizing residents to clean an area periodically, and thus to acquire a stake in its protection, will motivate them to discourage the litterer. Resident control is the mechanism by which most settled areas are kept in order.

Measures of localized protection may only shift the littering to other, less protected places, much as street lights or police patrols shift criminal acts from one part of a city to another. In the case of littering, of course, the official division of places into clean and dirty, front and back, could be a conscious policy, which it could not openly be in the case of crime. To make a more general improvement, it is necessary to decrease the supply of litter, as by the successful "bottle bills," or to make the approved wasting system easier to use, or to change common attitudes. The last is the hardest to do. Attitudes are largely unaffected by preaching and publicity. People are usually unaware of their own wasting behavior, or they suppress it. They live with their incongruities.

Although the collection of waste is closest to the citizen, giving rise to frequent complaint, it is the final disposal of the stuff that is the more desperate problem. The bill for dumping at sea that most coastal cities are running up, has now come due. Pollution diffuses through the sea as the sludge builds up on the ocean floor. New York City, which began to dump in the ocean in 1924, has by now created a square mile "dead sea," an ocean region almost devoid of life. As sludge returns to the Long Island shore, beaches between Queens and Southampton must be closed for various periods in the summer. Enjoined from further dumping as early as 1933, the city is still depositing tons of waste in the ocean every year while it searches desperately for alternatives. The municipal administration contends that were ocean dumping stopped abruptly, two million people would have to evacuate the region, because the city would have to shut down part of its sewage system, a system that in 1988 handled 1.6 billion gallons of sewage each day.

See figure 43

If wastes are to be excluded from the oceans, which cover three-quarters of the earth's surface, our refuse must be diverted to the land. There are three common means of land disposal: the open dump, incineration, and the sanitary landfill. In the open dump, now largely prohibited in the United States because of the danger of

15 Wastes dumped at sea return to pollute the New York beaches, but many bathers ignore the warnings. *(© Kirk Condyles)*

16 After a voyage of 156 days, the infamous garbage barge "Mobro" returned to Brooklyn. It traveled to 6 states and 3 nations in search of a place to dump 3,186 tons of unwanted New York trash. *(UPI/Bettmann Newsphotos)*

groundwater pollution, the material is simply piled up to decay or endure at some out-of-the-way spot.

If material is incinerated on site, then the inefficient small burners and poor maintenance pollute the air. Central incineration, which requires a relatively short haul and only a small site for depositing its burnt residue, can produce useful ash and heat. But it means high capital and operating costs, and some air pollution, even if carefully managed. In part, solid waste is converted into airborne waste. The conversion becomes serious if the operation is inefficient, due to inattention, deteriorating equipment, or an unfavorable waste mixture. Increasingly, municipal incinerators are shutting down.

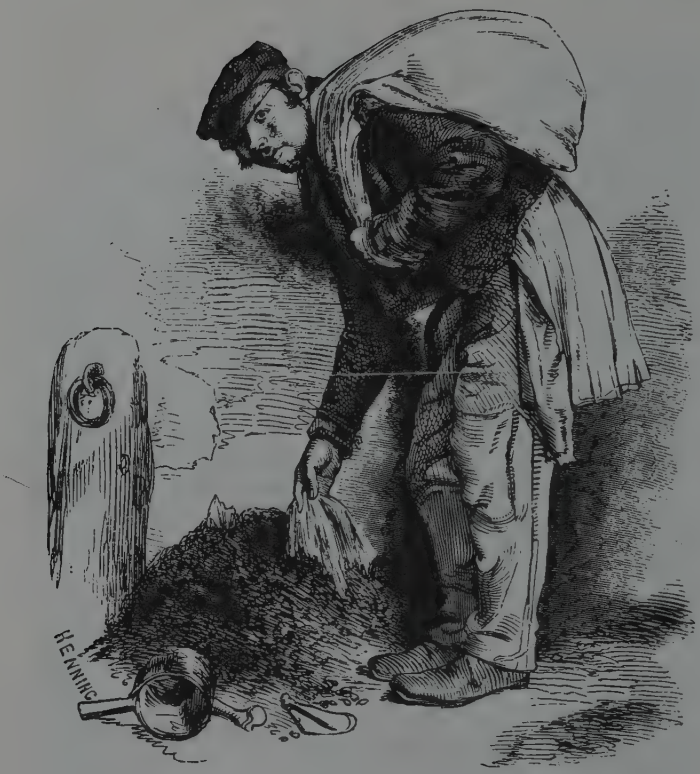
Landfill

By now "sanitary" landfill is by elimination the most common disposal method. Over 80 percent of all facilities were of this type in 1968. Garbage and trash are spread in shallow layers, compacted, and covered daily by thin layers of earth, also compacted. Anaerobically, the buried decomposable material converts to humus, carbon dioxide, methane, ammonia, and hydrogen sulfide. The ground settles slowly, and construction must cope with subsidence. The methane can be burned as fuel, and utilities are beginning to tap that source. It can also be explosive, and must be vented from underneath any buildings built on the land. Moreover, the fill can pollute a high groundwater table. In a survey of 6,000 dumps and landfills in the United States, only 6 percent were properly done.[4]

The landfill method is relatively inexpensive. It takes all kinds of refuse without distinction, it is a complete and seemingly final disposal, it causes no air pollution, and it reclaims unbuildable land—or destroys natural wetlands, depending on one's point of view. Yet it is also a temporary nuisance, it seals off substances that might have another useful life, and it is difficult to operate in bad weather. It requires long hauls, as usable sites are located farther and farther away. Indeed, it is the voracious consumption of land that is the basic obstacle to our reliance on landfill. Every large city searches constantly for new sites around its perimeter; disposals become more and more distant. Railroads carry some of Boston's rubbish into New Hampshire. In West Virginia, it was proposed that the narrow mountain valleys, whose coal has been mined out, be filled with the trash of the Eastern cities, carried in by the coal trains returning empty. The mountain people were less than pleased.

17 Disposal of solid wastes is a worldwide problem. Increasingly, municipal incinerators are being shut down since solid wastes, when burned, generate airborne wastes. *(© Catherine Lynch)*

Other methods of disposal have lost ground. Home garbage grinders are convenient, but they only shift the load to the waterborne system. In many towns, they are now prohibited. Garbage was once fed to pigs, but that is history. No one cares for the sty as neighbor, the garbage must be precooked to prevent trichinosis, and edible garbage is more and more difficult to separate from its packagings. Many other salvage trades are declining as sidelines, due to increasing labor costs and decreasing or unstable prices of the salvage material relative to its raw competitors. The rendering of carcasses for grease



18 The bone-grubber is a trade of the past in post-industrial economies. *(In Henry Mayhew,* London Labour and London Poor *[London: G. Newbold, 1851])*

has ceased, for example. The rag and bone trade is now almost gone, as are most of the salvage occupations so vividly described in Henry Mayhew's fascinating 19th-century survey, *London Labour and the London Poor.*[5] Rising personal incomes, and a relative fall of raw material prices, have suppressed most of the recovery enterprises that were such a marked feature of the early Industrial Revolution.

Composting

Composting, on the other hand, is being revived by gardeners and farmers, but also in a few central plants, particularly in Europe. Suitable waste is rapidly decomposed into humus by aerobic microorganisms. Since the material is recycled, no large site is needed and collection hauls can be short. Perhaps more important, composting is an excellent means of conserving the soil, a critical permanent resource.

Composting is sensitive to the composition of the waste, since the carbon-to-nitrogen ratio should lie within a narrow range, and surplus water and noncomposting material must be removed. Rubbish alone has too much carbon, and garbage is too wet. The input must be a controlled mix, adding animal wastes for nitrogen, and paper for carbon. Besides maintaining the proper input, the principal difficulty has been to find a steady market for the product, which is used by small gardeners and by city parks, rather than by commercial farms. In 1977, when eight upstate New York towns proposed to take some of New York City's sewage sludge (the city emits 200 dry tons per day) for compost for their parks and forest, composting would have cost $80 to $90 per ton, while dumping in the sea cost $30. In general, capital and operating costs are similar to those of incineration, even if the end product is given away. The direct reclamation of poor land by the application of compost or an irrigation with raw sewage is a current experiment.

Energy and Waste

Other efforts focus on extracting the energy content of solid waste, which is approximately half of that latent in coal. Large bulky items are removed, and then such useful or nonburnable things as metal and glass. The remaining waste is fired to make steam or electricity, or is charred by pyrolysis to produce a dense, pelletized fuel. Any resulting ash is placed in landfill, or is sold as aggregate or road material. A plant in Hempstead, Long Island, running on 2,000 tons of garbage per day, expects to produce 5,000 tons of aluminum every year, 40,000 tons of iron and steel, 25,000 tons of glass, 250 million kilowatt hours of electricity, and $50,000 to $100,000 in lost coins (which will be a deprivation for future archaeologists). As the price of oil rises, entrepreneurs and public agencies are battling for the rights to use the garbage of every large metropolitan area. The supply must be large and steady enough to guarantee a reliable source of power. A pyrolysis plant may need to draw on 200,000 to 300,000 people within 15 to 25 kilometers.

These plants are not without their troubles. There have been problems of air pollution. The net cost turns out to be two to four times as expensive as landfill. All seven new plants in the United States have problems of corrosion or emission. A large experimental facility in Baltimore was permanently shut down. Fumes from the plant in Hempstead entered the ventilation system of the Long

Island Air Traffic Center, and delayed its opening. Arsenic and chlorine gave the traffic controllers headaches, dizziness, and nausea.

Rural Dumps

In rural areas, the problem of disposal is different. On the one hand, the low density and low income of the population means less rubbish generated, and ample locations in which to dispose of it. However, that same density and income mean that dumps cannot be managed in expert fashion, and recycling cannot generate enough volume to attract a market. Exhausted vehicles, for example, are too few to attract a junk dealer, and must be transported too far to reach an operating scrapyard. Since they also may have some residual value to a country person for the occasional spare part, they are dropped where they die. Paradoxically, then, the scarcity of rural vehicles causes them to be highly visible after death, and the marginal damage of a piece of solid waste is substantially greater in the rural landscape than in the urban one. Local dumps might be consolidated into sophisticated regional landfills, but this would require intergovernmental cooperation, and long hauls for local people.

Social Role of Waste

For all its defects, moreover, the rural dump plays a different social role than its urban counterpart. The latter is an industrial process, managed by specialists. The rural dump, on the contrary, is open to any citizen. Here one legitimately renounces rights and responsibilities for one's own things, and legitimately acquires rights in the useful things renounced by others. One can loiter and meet a neighbor without stigma of idleness. It is a social exchange as well as an object exchange, and some aficionados will drop by twice a day, to spot new additions or to hear new gossip. In urban areas, similar exchanges are conducted in "garage" or "yard" sales, where low-value used articles are passed from one hand to another. The social exchange, whether or not between familiar neighbors, can also be a pleasure. Accompanied by relaxed price bargaining, the articles, unusable perhaps even for the buyer, are kept in circulation.

There are many biological examples of the social role of waste. Vertebrates and insects groom themselves, and groom conspecifics to reach those parts that cannot be reached by the organism itself. This cleaning and licking of others, in origin hygienic, has very generally been converted into a symbolic communication of conciliation and bonding. Indeed, most olfactory substances used in com-

munication had their biological origin as waste substances.

Recycling

Some wastes are regularly recycled in the private market. Consumer items are recycled to people of lower income. This is an uncertain trade, primarily of used clothes and appliances. The segregation of city residence by class has made it more difficult to connect supply and demand, and so usable waste is often lost. Military bases and college towns are the best locations for these trades, because their populations are transient and exchange is useful.

Industrial junk is better sorted, and is in more continuous supply than the domestic product. The salvage markets fluctuate constantly, since they are marginal to the basic supply of raw materials and sensitive to shifts in the design and use of objects. As mentioned, the major markets in grease, manure, old hides, and bones have now all vanished. Gasoline, on the other hand, was once a waste byproduct of the manufacture of kerosene. Rags, paper, glass, metals, rubber, and ashes have a resale value; synthetics, plastics, leather, and mattresses do not. Scrap metal is the heavyweight, but its price is very unstable: 70 percent of all the metal in the world is discarded after a single use. There is a limited market for aluminum cans, which if reused require 3 percent of the energy needed to refine aluminum ore. There is a good market for broken glass, but it must be carefully sorted. Of all recycled material in the United States, 90 percent is paper, which makes up over one-half of the waste stream. Its value leaps and collapses. Only one-fifth of the world's tires are retreaded, and the rest make astonishing heaps, or have astonishing reuses as retaining walls, fish reefs, and painted flowerpots. Lubricating oil can be cleaned and reused, instead of being discharged into storm drains or sewers. In some states, this recovery is now required by law. In Europe, it is encouraged by subsidy.

See figure 59

Significant use of scrap appears only when there is a sudden high demand for production (as in war), or where primary extraction becomes very expensive (as for copper), or where some prestige attaches to old things (as for antique furniture or the ornaments of old buildings). Due to this uncertainty, scrap dealers must hold large inventories, or know where to find unclaimed material. Cheap outdoor storage space and low interest rates are critical. Space for storage is not always easy to find, since communities dislike such uses. Dealers have inventory problems, due to the heterogeneity of their holdings, and

19 Unwanted cars are collected and stripped, their parts sorted and held in marginal lots until there is a demand for them. *(© Michael Southworth)*

some, such as used-book sellers, must depend on a specialized and very extensive memory.

Automobile recyclers take damaged cars of recent vintage and disassemble them into their usable parts. These are classified, boxed, stored in a building, and sold in guaranteed condition to dealers, garages, and "Saturday mechanics": starter motors, batteries, doors, brake drums, drive shafts, frames. Only the remainder is crushed for scrap. "We are not junkmen," they say resentfully.

Cars 4 to 15 years old go to the junkyards, where they are shredded, separated, and compacted for scrap; or they sit outdoors, to wait for the slow, irregular sales of their parts to individuals. Such operations need large inventories and extensive yard space. As cars reach ages of over 25 years, their values rise again. Specialists cannibalize them for rare parts. They become antiques, the stuff of printed catalogs and long distance sales. Indeed, it is possible to "plant" junk cars for the future; acquire cheap land, out of the way and out of sight, collect wrecked cars of moderate age at no cost, and wait.

When the price of scrap is low, abandoned cars on city streets are a serious problem. The process of establishing that a car is in fact abandoned—and not stolen or

parked—and that it can be picked up without penalty, is a time-devouring legal procedure. Getting the clearance to haul these eyesores to the junkyard is a recurrent headache for the police. But when scrap prices rocket, illegal scavengers appear, who snap up the stolen and abandoned cars on deserted streets, strip them for accessible parts, and rush them to the yards. The car is quickly rendered unidentifiable. A nuisance has become thieves' gold.

Junk vehicles are shipped to developing countries that are short of steel making capacity. Gaddani Beach in Pakistan, some 35 miles west of Karachi, is like an invasion coast. Old ships are floated in from all over the world, up to a hundred at a time. They are hauled up on the sand as far as they will go, and cut up for their metal. Ten thousand workers are employed on the beach, living in huts made of the ships' wood. They supply 70 percent of Pakistan's scrap steel.

As of 1970, the backlog of cars in the wreckers' yards had reached 10 million. But new methods of steelmaking now allow a greater use of scrap metal, and it is in short supply again, its value rising. Making steel with a mixture of clean scrap means less energy expended, less water pollution, less raw ore required, and less sulphur dioxide released to the air.[6] The estimated reservoir of scrap in the nation is 700 million tons, but much of it is scattered, worth collecting only when prices skyrocket. Some metals, on the other hand, are now in a higher concentration in urban areas than they were when in the form of a raw minable resource. Thus cities can be thought of as ore deposits.

The increasing use of plastics, aluminum, and alloy steels in new cars makes them much less useful for salvage. No one who designs cars for sale need think of how to dispose of them when they wear out. Sweden, however, has enacted a "bottle bill" for cars: the purchaser of a new machine makes a deposit that is refundable to the ultimate owner when the car is brought at last to the knacker's yard.

In rural areas, recycling is also taking place. Agricultural wastes are finding uses beyond the immediate farm. Much pulp is now exported as livestock feed. Thirty-three percent of the production cost of beet sugar is now recovered in the pulp, and residue offsets 72 percent of the cost of extracting alcohol and fructose from corn. Protein

feed for cattle and poultry can be produced by cultures of yeasts and bacteria working on cellulose, farm pulp, and discharge of breweries or paper mills, city sewage, or solid wastes; but most industrial solid waste cannot be reused, due to contamination by heavy metals. Technically proven but not yet economically viable, these are continuous processes, not especially sensitive to temperature or to waste composition. In tropical regions, they can go forward in outdoor ponds. Moreover, if the wastes are segregated, substrate and bacteria can be precisely fitted to one another. For example, bacteria can be developed specifically for eating nylons, or oil.

Body Parts

Human bodies can also be reused, if acquired in time. Cannibalism evokes our horror—in emergencies it may be quite rational—yet modern medical technology can make good use of organs from the recently dead. Corneas, kidneys, and even hearts can be transplanted successfully to living recipients, not unlike the use of old auto parts. Here, too, recycling institutions have developed—eye banks and donor agreements—hedged with stricter limitations. Since we feel an intimate connection between our personal identity and our body, it is hard to think of the latter as reusable waste. Recycling is therefore expensive and laborious, and human spare parts are in short supply. While we now routinely accept the use of body parts of the deceased, the use of fetal tissue in medical care is another matter. Fetuses from miscarriages and abortions now have potential for further use since fetal cells have been found valuable in treating various diseases such as Parkinson's and Alzheimer's. However, intense debate surrounds the question of whether or not to allow medical use of the fetus and research is highly restricted.[7]

As for whole bodies, the need for cadavers in medical schools is acute. In New York City, for example, whose schools can use 600 bodies a year, even when eight to ten students work on the same body, the available supply is half the demand. Poverty and the infamous "body snatchers" of the 19th century once diverted a sufficient supply of bodies into the medical schools, but no longer. At one time, there were 400 to 500 unclaimed bodies every year in the city morgue, but now the number is closer to 80. There is greater incentive for claiming them, as poverty levels lift, and welfare programs pay for funeral costs. Strenuous efforts must be made to persuade living

people to pledge their bodies after death. Perhaps it will be necessary to create financial incentives, such as body gift tax credits, ghoulish as that may sound.

Burial

In some countries, space for the proper disposal of bodies runs short. In the United States, cemeteries, like all disposal sites, have been pushed out to the city margins. The remaining central graveyards no longer receive new dead. But they have become valuable central green spaces since, unlike other waste sites, they are notoriously difficult to relocate. In the Japanese culture, the family is supposed to have a fixed, joint place of residence in death, preferably in some quiet Buddhist temple close to the village of origin. Here the living family members revisit the ashes of their dead on prescribed yearly occasions. But the urban millions are now remote from their rural origins, and the urban cemeteries are filling up. The smallest burial plot in Kamakura, some 40 square feet in size, now costs $7,500, which the family acquires on installments. Multistory incinerariums are built in Tokyo, with banks of lockers, 9 by 18 inches, to hold the ashes. Tiny baskets of plastic flowers, or perhaps a child's favorite toy, hang from the compartment door. Thus, a culture that cannot tolerate any direct recycling of the body, not even a reuse of the burial space (although Buddhism proclaims the eventual absorption of the individual into a transcendent whole), is forced to an elaborate technical response.

The Homeless

A more acute social problem is the waste of those still alive. Every city in America has many homeless who keep on the move with a few possessions, and sleep in public spaces. Lost and confused, they live by scavenging and begging. Endangered rather than dangerous, they are constantly subject to mugging and assault. They began to spread out within the cities most noticeably after the great emptying of the mental hospitals, where they had previously been stored.

Child runaways also live on the streets and in abandoned buildings—an estimated 20,000 in New York City alone. They beg, steal, and scavenge, living on food handouts, drugs, and prostitution. They find excitement and tolerance in the streets, as well as danger. Typically, they left home when life became difficult due to drugs, alcohol, unemployment, despair, or cruel or indifferent parents. They tend to stay near their old home neighborhoods, where there is a tolerant and supportive society. To a

20 Scavenging is still an important means of livelihood in many countries. Outside Beirut each morning men and children pick through the freshly unloaded garbage for saleable glass, cans, and other articles. *(Reuters/Bettmann Newsphotos)*

degree, they are healthy castoffs. They are not real waste; they have a future, or could have one.[8]

Scavengers

The golden age of the junkman in the United States was from 1910 to 1930, in a society no longer poor but not yet affluent, when there were many manufactured products and many low-wage workers, and when repaired things had a value. Like construction, junk was an immigrant opportunity, a trade one could enter with little capital and on which one could build an empire. Fortunes could be made, but it required mobility, careful sorting, quick wit, and a good memory—an ability to find hidden links between need and source. It is a free market with little systematic data or official regulation, carried on in cash, and often in evasion of taxes. No college teaches the trade; no business school case is based on it. Centrally planned societies, like armies in war, have severe problems with recycling. Spare parts are often short. Extralegal "five percenters" appear who will undertake to acquire what you need—for a price. New equipment

is wastefully cannibalized for the needed spare parts.

The British gypsies are a marginal group of long standing and marked character. Turning away from earlier livings in horse dealing, tinkering, entertainment, and petty thievery, they now focus on the waste trades, principally rags and scrap metal. Rags are picked from refuse dumps or collected from houses in return for cheap "gifts." Even this trade is declining. Their mainstay now is junk: car-breaking, parts, and scrap metal. They burn off the car shells, and leave the unsalable remains at their campsite when they move on. They must work near the large towns, where the supply and the market are largest. They are the lowest tier in the British scrap metal industry.

In Japan, in Meiji times, the three lowest occupations were the carriers, the mud-handlers, and the ragpickers. These were at the very borderline of legitimate employment: many of the poor preferred to beg or steal rather than to do such work. The ragpicker, scavenger of the street, is still at the bottom rung today. He gathers any cans, glass, paper, rags, rubber, metal, straw, or wood

21 Rag dealers in the Valmy district of Paris, 1913. *(The Bettmann Archive)*

that he can find. Next above him is the rag buyer, who purchases wastes from households, using capital furnished daily by the rag dealer. The dealer backs his buyers, buys from the pickers, and stores, sorts, and sells the material to the rag processors, who are the next rung above. The processor treats the sorted material and passes it to the factories, which use it as raw material. Pickers and buyers are usually housed in the storage yard of the dealer, but Koji Taira describes an unusual commune of ragpickers called the "Ants' Villa." Organized in 1950, when 15 pickers had been discharged by a retiring dealer, it is located on a former refuse dump on the Sumida River, on land rented from the municipality. The Villa is now a complete self-governing producers' and residential cooperative, with its own housing, workshops, chapel, restaurant, recreation, and guesthouse. The pickers have transformed themselves and their occupation.[9]

Waste Cycles

Richard Farmer proposes that there is a regular historical cycle in any society's use of waste manufactured material. At first, in very poor, low-skill cultures, junk lies unused. People have no means of repairing a product that derives from a more technologically developed source, and so it is cast aside at the first malfunction.[10] The Native Americans acquired the horse and the gun from the Europeans. They made good use of the former, but could not repair the latter once it grew rusty or failed to fire. The engines and cars of the Hejaz Railway, halted by Lawrence's guerrillas in the Arabian Desert in 1916, were still there in 1962. The nomads had no use for them, except for the wooden sides, which they burned in their fires. But when the desert economy advanced to the point where metal and machinery became useful, the cars quickly disappeared. Surely we will do the same with the novel products brought by our first visitors from outer space.

As skill and income rise a little, junk is collected and reused—first as it is, then in a crudely reprocessed form. Material is dear, and labor cheap. Next, as skills rise faster than income, all junk is carefully collected, sorted, repaired, and redistributed. Repair skills are advanced and ingenious—higher, in fact, than they will be in any subsequent stage.

Later, as human skill can be used more productively in acquiring and processing raw material, and as goods become abundant and cheap labor disappears, certain wastes begin to accumulate, especially low-value items

such as used concrete or broken glass. Specialized junkyards appear, which sort and store the useful waste. The junkman becomes a manager rather than a scavenger or a repairer. Eventually, it becomes more economical to let things go to waste than to reuse them, and even useful waste piles up. The problem shifts to waste collection and disposal; the skilled and discriminating junkman becomes the low-status, undiscriminating trashman.

"Remanufacturing" is now a growing activity; the reassembling of repaired components into a machine whose working life will equal that of a new one. Many parts of a "dead" machine are still completely functional, since few machines can be designed with the all-pervading obsolescence of the one-horse shay. Rebuilding a used car normally means nothing more than repairing those individual parts that have failed; remanufacturing is the more radical disassembly, repair or replacement, and reassembly of all the separable components on a regular production line. It can offer a warranty equal to that of a new machine at two-thirds the price. It can conserve 80 to 90 percent of the labor and energy invested in the reused parts, in contrast to recycling, which salvages only the material. Telephones, computers, office equipment, locomotives, power plants, and industrial robots are among the objects now being remanufactured, and there are estimates that up to 80 percent of all industrial goods may eventually be so treated. On the other hand, the prejudices of the individual buyer will make it much more difficult to achieve such changes in the production of consumer goods.

Martin Pawley applies these ideas to the production of houses.[11] Concentrated industrial wastes may be a realistic target for recycling, but the costs of collecting and reprocessing consumer wastes are too high. Packaging, which makes up the bulk of such wastes, has a particularly short useful life. Where packages cannot be directly reused, as was the milk bottle, they might well be designed for a secondary and more permanent use as construction material, harnessing the efficient production and distribution system of the mass consumer industries to the making of houses. A consumer industry might be allowed to market its goods in a developing country, for example, only if it agrees to design its packages to be reusable for a secondary purpose, if it supplies the information that will make that possible, and if it advertises

22 Examples of houses made from waste materials are found in most countries. This one was made of cans and bottles on a steel frame by Walter Sizemore in San Jose, California. *(East San Jose Sun)*

its product so that its glamor is linked to the secondary use. Pawley recounts the efforts of the Heineken Brewery to produce a beer bottle that could be used as a building brick, and his own attempt to persuade the Allende government in Chile to use waste material for housing. Throughout these innovative proposals, he focuses on the technical solution, however, and neglects the *feelings* that people hold about their houses, assuming that they will easily accept "garbage housing" if it is properly advertised.

Many informal exchanges of material take place outside of the normal market. Garage and yard sales are organized by neighbors and announced by cardboard signs on tree trunks. Old goods change hands at low prices, at times only to move on to the next local sale. To take another example, great quantities of furniture are put out on the streets of Cambridge, Massachusetts, every September, when thousands of student apartments are turning over. New students roam these collections, gathering furniture for their own term of residence. The curbs are linear recycling dumps. At the end of the summer, in vacation spots such as the island of Martha's Vineyard, some departing visitors even abandon their summer pets. The newly feral cats and dogs survive for a time on scraps and wild prey, and then succumb to starvation and disease.

Only a few are recaptured, to be put to death, or perhaps to be recycled through another family. Some of our wastes are still alive.

Hazardous Wastes

Of some 375 million metric tons of industrial waste produced every year in the United States, some 57 million tons, or about 15 percent, is classified as "hazardous"; that is, corrosive, reactive, explosive, ignitable, or toxic. The volume of hazardous waste is growing at a rate of 3 to 3½ percent per year. Of all the hazardous waste in this country, 90 percent has, by present standards, been disposed of improperly. Most of this has simply been buried, or even dumped on the ground or poured into sewers and streams, contaminating soil and water for long periods. It is estimated that 30,000 to 50,000 sites contain such wastes, many of them unlocated, and that it would cost $44 billion to eliminate all the health hazards connected with them.

The Environmental Protection Agency finally issued its regulations for the disposal of hazardous wastes, under the authority of the Resource Conservation and Recovery Act of 1976. This 2,000-page document (and its later amendments) regulates future disposal procedures, setting definitions and standards for storage, treatment, and disposal, requiring the continuous tracking of such wastes from generation to final disposal ("cradle to grave"), and requiring the monitoring of the "final" sites for 20 years. Firms that produce less than one kilogram per year are exempt. The new rules will cause most previous landfill operations, and many small disposal companies, to shut down. The costs of proper disposal, small as they may be compared with the social costs of a careless discharge, will rise significantly. Landfill capacity for hazardous waste disposal is desperately short. Designation of any new site is inevitably controversial. Moreover, the rules do not deal with the legacy of the past. Previously unknown sites are continually being discovered by accident, or by reason of some illness traced to them.

There are several ways of dealing with hazardous waste. Landfill, however common, is properly only the last resort. It is preferable to reduce their generation, or to find ways of recycling them within the industrial process. As soon as regulation begins to raise disposal costs, and policing and political outrage discourage illegal disposal, and raw material costs rise, these recycling techniques will begin to be used. Years ago, the EPA estimated

that 3 percent of industrial wastes might be reusable; they now estimate 30 percent, and some enthusiasts cite 50 percent. "Waste exchanges" have been set up that list industrial wastes being generated and available for sale, to link potential users with generators. Industries are finding new uses for their wastes, turning them into byproducts, or even "co-products." For example, the fly ash that will be produced increasingly as the nation turns back to coal makes a superior cement. It can also be a source for aluminum, or a cover for a sanitary landfill.

Where the generation of hazardous waste cannot easily be eliminated, or the waste cannot be reused elsewhere, then disposal is necessary. The best methods are chemical detoxification or biological degradation. The former will produce a small, concentrated toxic residue that must itself be buried, but the bulk of the material is separated and rendered safe. It may also become reusable. Biological degradation, usable for certain sludges or organic materials, is carried out by aerobic bacteria. It may be done by "land farming," where the waste is spread on the ground, mixed in, and then regularly aerated until harmless. Or it is composted, and the generated heat speeds the process.

A less desirable mode of disposal is controlled incineration, which can be safe and clean if carefully done with sophisticated technology. It is the most expensive technique of all. Local citizens resist it; they fear a mishap and remember the fumes of the old municipal incinerator. Somewhat cheaper technology can be used by incinerator ships, which carry their poisonous cargo well out to sea before burning it. Local resistance is outflanked, but ports must be equipped with depots for safe temporary storage, and the temptation is there to be less than careful with the oceanic air. However, 10,000 surplus tons of Agent Orange, the deadly herbicide used in the Vietnam War, were burned away in one of these ships in the mid-Pacific and no residue could be detected.

A much cheaper method for getting rid of hazardous liquids is injection in deep, isolated limestone or sandstone beds 1,000 to 3,000 meters beneath the surface of the earth. Unfortunately, the safety of this method is in doubt. The wastes may find their way into groundwater through unsuspected channels, or may even, by some evidence, release earthquake movement. Cheap as it is, the technique raises uncomfortable memories of past attempts simply to distance our wastes from ourselves.

When recycling, detoxification, biodegradation, or controlled incineration are all impractical, and deep injection is suspect, then land burial is our last resort. In any case, it will be the necessary last resting place for the concentrated residues of those preferable methods: the wastes of wasting, or W^2. But it is a temporary solution, and must be gingerly done. The residue is solidified, sealed in barrels or within synthetic films, and deposited in a pit, in well-drained stable ground high above the water table. The pit is sealed with several feet of dense clay—below, on the sides, and, when complete, above. Different types of wastes are sealed in segregated cells, and their locations, types, and quantities are recorded—a well-organized warehouse of horrors. The sealed pit has its own drainage system, lest any water enter or any leaching occur, and so polluted liquids can be pumped out and treated again. Finished off with earth, over its clay seal, the fill apparently disappears. Numerous wells are drilled around the site, so that any trace of pollution that might appear in the adjacent groundwater will be detected. These wells will be monitored, and the interior drainage system maintained, for 20 years after the dump is closed. This is a maximum security prison for permanent offenders. The risk is reduced, but it remains. The Pharoahs took even more elaborate measures to preserve their dead for eternity.

Public opposition to the designation of hazardous waste sites has grown. In 1973, U.S. polls indicated that most people would accept the presence of a waste disposal site in their vicinity. By 1980, over 50 percent of the respondents said they would oppose any hazardous waste site within 100 miles of their homes, and that they would move away if one were located there despite their protest. Whether such a mass migration would really occur is dubious, but the opposition is certain enough. States must override strong local resistance to acquire a new site, or the material is trucked to distant states where resistance is not yet vigorous. One sophisticated and reputable disposal concern in Massachusetts, for example, trucks its remaining residues to a secure landfill in South Carolina, situated in an old surface mine used for the production of Kitty Litter. Waste calls to waste, just as the dirty gutter attracts the gum wrapper.

Rationally the risk of these landfills is small and must be borne. But the fear of them cannot be quelled by reason

alone. Families can be torn apart in such conflicts. Forty percent of the families resident on the Love Canal site were separated or divorced within a few years of the first discovery of its toxic effects. Wives wanted to leave with their children; husbands felt committed to their house and job. There was anger, confusion, and a sense of betrayal. The men lost confidence in their ability to protect their families. Serious as were some of the physical effects of those wastes buried 40 years earlier—including increases in the incidence of miscarriage, congenital malformations, and disorders of the urinary tract—the psychological and psychophysical effects were far worse. Ironically, people came in eagerly to buy the freshly repainted houses after the site was decontaminated many years later. The growing opposition to new hazardous waste sites, the efforts of experts to reassure the public, and their schemes to release steam by means of public hearings while retaining the power to make decisions recalls the heyday of urban renewal.

Opportunities for illegal profit appear, as legal dumping becomes more intricate and costly. Organized crime is moving into the field, from its base in prostitution, drugs, and gambling. (Note that all of these trades, along with wasting itself, are services in demand among respectable citizens.) A man suspected of being a Mafia "soldier" is an officer of several New Jersey waste disposal companies and is accused of two counts of illegal dumping in Massachusetts. In testifying before Congress that hazardous waste investigators be allowed to carry arms, New Jersey's deputy attorney general declared that "the waste industry is probably one of the most violent industries in the nation today. . . . There have been murders, threats, arson. . . ."

The part owner of a disposal company whose burning warehouse threatened the city of New York claimed that his company had been taken over by organized crime. The company made a $7 million profit by illegal storage of toxic wastes in the warehouse, and then, when that warehouse was forced to close, began illegal dumping on Staten Island. The New Jersey Department of Environmental Protection launched a long legal battle against this firm, culminating in the seizure of the warehouse and the gradual removal of 10,000 barrels of the most dangerous materials: mustard gas, benzene, and cyanide. Twenty-four thousand barrels of used chemicals still remained,

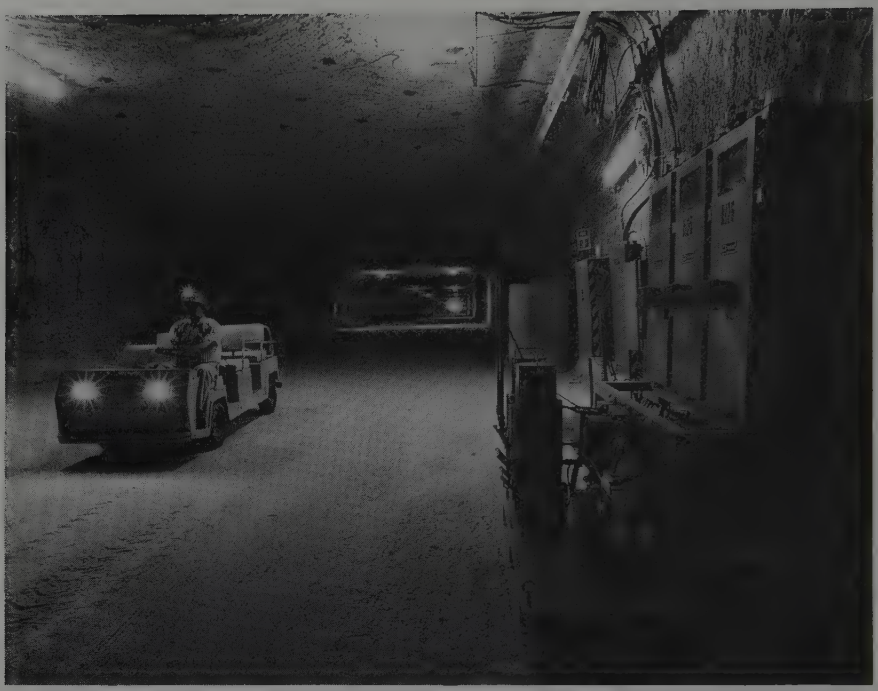
however, when the warehouse exploded in flame. Only a favorable wind prevented the forced evacuation of both Staten Island and Elizabeth, New Jersey.

In all the resplendent court of hazard, radioactive material (radwaste) bears the crown. The Mafia has not yet been able to penetrate this sphere, which is reserved for governments, armies, and utility corporations. Some of the elements involved, such as strontium 90, have a relatively brief half-life, and may no longer be hazardous after a few hundred years; other components may remain dangerous for 250,000 years. Most U.S. radwastes are probably in reasonably safe temporary storage at the present time, although there has been some leakage of liquids from steel storage tanks in Hanford, Washington. These liquids were then solidified into salt cakes, making their eventual disposal more difficult. There are some uncertainties about earlier disposal, such as that from the Manhattan Project in World War II. Its wastes were shipped to an abandoned military base near Lewiston, New York, which was originally built to manufacture TNT, but was closed after ten months of operation. Records are poor as to the location and condition of this Manhattan material, and the land, which was a peach and cherry orchard before the war, is about to be used again as a waste treatment plant and secure landfill.

Permanent Storage

While the radwastes, civilian and military, are in temporary hold, the looming issue is permanent storage. French technology seals the material within a glassy shell. These vitrified wastes must still be put somewhere, and there have been speculations about placing it in the Antarctic ice or on the deep ocean bottom, or shooting it into the sun. Put on the polar ice sheet, for example, it would melt its way to the bottom of the ice in 30,000 years. But Antarctica is international territory, kept open by treaty for future use. Should it, or the deep ocean, or even outer space (short of the atomic furnace of the sun) be contaminated permanently?

At present, the best hope is for burial in deep salt deposits, presumably impermeable to water and "secure" from geologic change. Testing for such a permanent store near Lyons, Kansas, was dropped when local opposition mounted, and the presence of water was detected. The first planned disposal site for nuclear waste is now being constructed near Carlsbad, New Mexico, in salt deposits 2,000 feet below ground. Although EPA requires



23 The first planned disposal site for nuclear waste is being constructed 2,150 feet below ground in huge man-made salt caverns near Carlsbad, New Mexico. Since plutonium has a half-life of 25,000 years, the long-term safety of this or any other toxic waste storage facility is unknown. *(U.S. Department of Energy)*

that such storage areas be safe for 10,000 years, plutonium has a half-life of 25,000 years. Will the salt deposits provide safe storage? Many scientists think not, because they may be subject to water infiltration. Despite widespread fears about accidents at nuclear plants, a survey finds that the public thinks that long-term disposal is the worst hazard of nuclear power. The wastes from the power plants may soon be increasing each year by an amount equal to the total existing military inventory in the late 1970s. By 2000, the estimated accumulation of radwaste will be 330,000 cubic feet of solidified waste from the nuclear industry, and 11,000,000 cubic feet by the military.[12] The earliest possible date for permanent disposal is still several years away, and its estimated costs, should the utility companies foot the bill, will add 4 to 5 percent to power costs.

Besides geological security, one must consider, over the course of time, the possibility of an inadvertent mali-

cious disturbance of the deposits, by persons or creatures of nature and motives unknown. An archeologist, after studying the pyramids, the Serpentine Mound, the Nazca lines, the Great Wall of China, the Acropolis, and Stonehenge, recommended Stonehenge as the preferred way to mark nuclear deposits for future generations. Huge dense megaliths would be sunk 5 feet into the ground and would rise 20 feet high. Engraved on them would be the message: "Danger, Radioactive Waste. Do not dig deeply here" in English, French, Arabic, Spanish, Russian, and Chinese, as well as a pictograph of a man digging with a diagonal line across. The signs would be vandalproof and highly visible, and would not require maintenance.[13] Similarly, the Energy Research and Development Administration has suggested that pyramids be erected above waste sites to warn off future civilizations (true monuments to waste!), yet in that time span our languages and cultures will be gone, our species may no longer exist, and a new ice age will most likely have

24 After studying several ancient monuments, archeologist Maureen Kaplan suggested that the best way to mark nuclear disposal sites would be with stone monoliths at the perimeter of the site. The stones, tapered for stability, would be buried 5 feet into the ground and would rise 20 feet above ground. Warning symbols, pictograms, and words in several languages would be engraved on them in the hope that future civilizations could decipher the message. *(© Michael Southworth)*

swept the monuments away. Others have suggested that radwastes should be made as irretrievable and as widely dispersed as possible, to minimize the danger of inadvertent uncovering. That is, these poisons should be sown thinly over all the earth. What if some unimaginable future society *wanted* the material? And suppose they could put it to some benign use. Our complete inability to predict such a future makes a mockery of our evaluations. It is hard to think beyond the human race; one can only fear for life.

The immediate dangers of plant failure, or the loss of radwaste in transit, attract more frequent attention in the news. A strong protest movement against nuclear power and the manufacture of nuclear weapons has developed. Making weapons creates the same dangers as nuclear power on a far larger scale, threatening a complete and deliberate annihilation without the redeeming value of any useful productivity. Ironically, the information on the construction defects of the Shoreham, Long Island, power plant, used by the demonstrators against it, was found in a box of technical reports picked up at the local garbage dump.

The event at Three Mile Island caused no immediate deaths, but led to sufficient financial liability to push the parent company close to bankruptcy, and sufficient political uproar to slow the financing and construction of further nuclear plants in this country. (Similar slowdowns have occurred in all the advanced democratic nations except for France, which is reported to be better at "managing dissent.") Cleaning up Three Mile Island will cost approximately $3 billion and will require an estimated 2000 workers. They will need 200,000 cloth coveralls, 1 million paper ones, and 1 million plastic ones, as well as 100,000 raincoats, 1 million pairs of plastic booties, 100,000 pairs of rubber boots, 1 million pairs of rubber gloves, 100,000 surgical caps, 1,000 hard hats, 10,000 sponge mops, and 1 million square feet of plastic sheeting. And all this (except the workers, we trust) will have to be disposed of as contaminated waste. Ironically, the site has become a tourist attraction, with over 650,000 visitors since 1979. Walking and minibus tours are available along with T-shirts and other souvenirs. Films explain the accident and video cameras allow visitors to see the clean-up process. "It's got a certain aura about it," said a spokesman for Pennsylvania's General Public Utilities Corporation (the owner).[14]

Archeology of Waste

Wastes are full of information. Archeology is based on it, and the technique has been extended to the study of contemporary society. Harvard archeologist Alfred Kidder trenched the dump of Andover, Massachusetts, in the early 1900s, and the Rathje and Hughes "garbage project" examines regular samples of Tucson's garbage each spring.[15] Levels of consumption can be measured, including the actual nature of the diet, the wastage of food, and the variations between the various social groups. Real consumption may be quite different from that reported in interviews. The students who count and classify the daily take lose none of their aversion to what they handle, but they become conscious of their own modes of consumption. Indeed, they would not want other investigators to check *their* garbage. If we were more open to what we discard, we might learn more about ourselves.

Religious prescriptions about waste disposal can enhance the information carried forward. The goods left with the dead to enrich their afterlife in reality enrich the reports of archeologists. The worn-out sacred manuscripts and ritual objects of Judaism are ceremoniously and permanently disposed of in the *geniza*, a special repository in the attic or the cellar of a synagogue. The discovery of some 90,000 such manuscripts in the geniza of the old Ezra synagogue in Cairo revolutionized the study of the medieval history of Palestinian and Middle East Jewry.

Criminal investigations are based on the evidence in waste. The conviction of Joseph Bonanno, the Mafia chief, was based on a three-and-a-half-year study of his trash. Court cases have revolved around a violation of privacy caused by waste examinations, and some public figures hire guards to protect their trash from the curious. Paper shredders destroy office wastes in order to blind an investigator, just as the garbage grinders of Tucson blind the analyses of Rathje and Hughes. One might speculate about how to deposit our household wastes so as not to blind the future archeologist, or how to blind him more effectively if we want to obscure our present state.

The Stream of Waste

Thus a majestic swelling stream of material and energy passes through any human settlement. There are problems of collecting waste and of dispersing it, problems of transforming it, reusing it, or sealing it off. It involves costs and dangers, real or perceived. It is symbolic of loss and degradation. It is often highly visible, typically unpleasant, and yet may be quite useful. It can be a trivial

phenomenon, and also a symptom of profound difficulties. Accumulated from a broad hinterland, it is consumed, and then passed on to some exterior sink, or is allowed to accumulate on the urban site. Gas, oil, coal, and wood come in; waste heat, ashes, and the oxides of carbon, nitrogen, and sulfur are thrown forth. The water and food going in are balanced by the sewage, garbage, compost, offal, and plant scraps going out. Paper, metal, and plastic packaging become trash and litter. Metals and ceramics convert to scrap; cars, machines, and equipment become junk, clothes become rags, sand and gravel become building rubble. Rubber burns or piles up. Some novel chemicals persist. The city is a great machine for concentrating and converting substance and slowly, despite the constant efforts at dispersion, its site acquires mass and a special composition.

May we now enter another stage, as the costs of raw resources and of disposal rise, and as we become more concerned about environmental degradation or see values in old things? May we move into more highly organized ways of recycling, which do not discard the advantages of large-scale production? Industries might be designed to rebuild, as much as to build new. Equipment might be designed for ease of repair, rather than for obsolescence. Material recovery imposes costs of energy, space, new material, and human labor. Nevertheless, we cannot throw anything away, since there no longer is an "away." As far as we can tell from our experience to date, although materials may change in form, they cannot disappear.

CHAPTER THREE

The Waste of Place

SEWAGE, SMOG, GARBAGE, scrap, litter and trash make up the daily waste flow of the city. There are more protracted wastings in nature. Supernovas explode, and the shell of debris racing out into space sweeps up the dust and gas from which new stars condense, to reignite the atomic furnaces. The sun wastes its substance, and the mountains wear away. They are thrown up with a vomiting of magma, gas, and ashes, which destroy living communities and then convert to the fertile volcanic soil that supports new life. Carbon is extracted from the air by plants, and is locked by their death in beds of coal, or pools of oil. The calcium in the shells of sea creatures drifts to the depths, there to be sealed off in deep limestone layers. The smooth circling of the ecological system is only an aspect of more pervasive change—more protracted, more violent, more wasteful of matter and energy, more an irretrievable flight than a placid turning.

The Natural Cycle

See figures 33, 35

The earth is intensively energetic, compared with other satellites of the solar system. Its surface is broken into separate plates that grind against each other. The ocean crusts are pushed down into the mantle, and boil up again at the rift valleys. This dynamism torments us with earthquakes, volcanoes, tsunamis, and hurricanes, but also gives us rich concentrated resources, formed and still forming. Life itself needs more than carbon, hydrogen, nitrogen, and oxygen for survival. At least 20 other elements are essential, in definite concentrations. Old, stable areas of the continental shields, subject to tropical weathering, are agriculturally unproductive, since they lack some of these important elements in the soil. Active volcanic regions, whose new rocks expose a wide spectrum of trace metals, are far more fertile.

See figure 34

Man is now a significant agent in the transfer of material in this dynamic system and may soon be the dominant one. If the rate of garbage production in North

America were to be equaled throughout the world, then that mass transfer would somewhat exceed the rate of volcanic upwelling that has built the mountains of the Pacific rim. If the per capita rate of the use of new minerals that characterizes the modern industrial world should be adopted by even 15 percent of the world's population by the year 2000, then it will amount to 20 billion tons per year, which is a mass comparable to such global processes as mountain-building, erosion, ocean crust formation (estimated at 30 billion tons per year), or the recycling of all the earth's biomass (estimated at 60 billion tons per year). Combustion adds 50 billion tons of carbon to the atmosphere each year, which is 1 percent of the total already present. We now discharge such metals as iron, copper, zinc, and lead into the oceans at rates that exceed natural processes by an order of magnitude.

Human Waste of Place

These great wastings are echoed in the human settlement. Buildings are abandoned, moved, or demolished; whole areas are cleared and rebuilt. Materials weather and age, are broken up and reused. Vandalism and arson render sound structures useless. Inner-city regions may be deserted—at first slowly, then with increasing speed. Lands fall vacant or derelict. Abhorred, unwanted uses are shunted out to marginal areas. Entire cities may decline or gradually be abandoned.

Kyoto was once a capital of 400,000 people, and it contains 700,000 today. Yet it shrank to a village in between. A wooden city, it went through repeated fires and savage civil wars. Buildings were thrown up by forced labor, abandoned, ruined, burnt, moved, or given away in pieces. Palaces were occupied for only a few years, or even for a few days in the year. Emperors and nobility moved about between houses and temples as their palaces were destroyed. The waste of habitat was on a grand scale. Here, as in many other ancient societies, buildings and even settlements were wasted deliberately, as a symbol of royal prestige and purity, just as emperors were served more than they could eat, and possessed more clothes than they could ever wear. New cities and palaces were at one time built at every accession, and abandoned at each royal death.

Wreckers and Scavengers

Superficially, the building wrecker is like the saprophyte of the natural system, which reduces dead organisms to their simpler elements to speed the recycling of matter. But the likeness is only superficial. The sapro-

phytes break an organization down into simpler compounds, in order to make use of the material and the energy released. Wreckers also break up old patterns, but they make little use of the energy so released. The salvaged material is only incidental to their work, and much of it is more intimately mixed when they are done. They are recyclers only secondarily, and certainly they are not remanufacturers. They are paid to clear a space, and not to prey on the dead.

It is the vandal stripper who more closely resembles the natural saprophyte. In ancient cities, old monuments and buildings were routinely mined for their stones, beams, or roofing material. A Roman imperial rescript to the Count of the East, in 397 A.D., instructs him to use the material from demolished pagan temples to maintain the public bridges, highways, aqueducts, and wells. The ruined aqueducts of Rome were closed in to make squatters' dwellings. A heap of old rubbish from the Great Fire, which encumbered eight and a half acres of central London for half a century, was shipped as fill to create the new Russian city of St. Petersburg. One advantage of living in any ruined city is its concentrated wealth of material, as well as the half-built spaces it affords.

Modern demolition is an organized trade, intended to create a site. Decorative materials are salvaged first, as well as metals, doors, windows, plumbing, good lumber, hardware, pipe, clean brick, and wire. Then the structure is reduced to rubble, and the rubble is carted away. Once it would have been burned on the site to reduce its volume, converting building waste into air pollution. Now on-site burning is prohibited, and the bulky rubble must, at substantial cost, be carried off in huge trucks. The dumps for which it is destined lie at increasing distances, and so illegal dumping by small demolition contractors has become profitable. The demolition sites themselves must then be fenced and guarded against hit-and-run depositors. If the rubble is disposed on site, as happened in the ancient cities, then ground levels gradually rise, producing those elevated "tells" that mark the locations of most former cities in the Middle East. In medieval Winchester, the accumulation of rubbish in the course of 150 years caused one street to rise five feet. A more modern example is Berlin, which has built its famous "Mt. Junk" out of the rubble of its wartime ruins.[1] Similarly, the abandoned apartment structures of Breezy

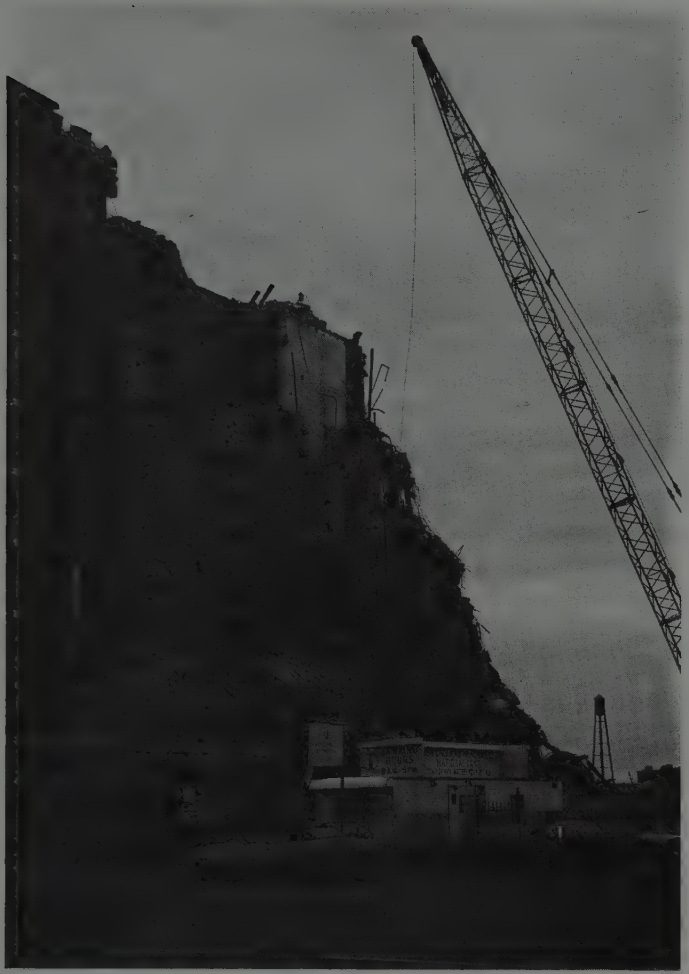
See figures 39, 87

Point, Long Island, have been converted into lookout mounds in the new national park.[2]

One soils scientist in the Netherlands asserts that construction in his small country must stop altogether by the year 2000, unless builders are able to check the flow of material from the sources of aggregate in the upland east, through the new buildings, to eventual demolition and deposit in landfills in the lowland west. Forty square kilometers of eastern excavation are gouged out each year, and one-and-one-quarter square kilometers of new landfill are piled up in the urban west. The existing elevation differential in the nation is slowly being reduced. To check this flow, building rubble must be recycled; structures that can be dismantled and reused must become the norm. Architects must begin to think about holes in the ground, about flows of material, and about the topographic inversion of their country.

Masonry rubble is commonly reused as landfill. Broken concrete can also be used as coarse aggregate in new concrete—at some reduction in strength. But if the old concrete is contaminated with gypsum or other substances, it is of very little use. The combustibles, once so easily burned off, now mix into the whole mass of rubble and complicate its use as a stable, compactible fill. Due to the labor costs of sorting today, and to the new synthetic building materials, little salvage is economically feasible other than the special decorative items. But recycling plants can make 60 percent of all demolition wastes reusable, if they can locate at least 200,000 tons of it per year, and can be within 20 kilometers of the supply, their market, and a landfill site. Thus they are economical in cities of over one million people.

Demolition uses special techniques and machines: wrecking balls, pusher arms, explosives, bursters, thermic lances. The most delicate work is still done by the skilled "topmen," who are standing on or next to what they are taking down, and thus in constant risk of falls, collapses, fumes, dust, nails, and bad footing. The rate of injury is very high: wrecking firms may pay one-third of their payrolls to cover workmen's insurance. Demolition is temporary and irregular work, but also dangerous and highly skilled. It is not unionized. In England, it tends to be carried down a family line. The topmen migrate from job to job, personally known to one another and to the contractors. In its camaraderie, its stigma and



25 Demolition is a highly specialized and dangerous activity requiring special techniques and equipment. *(© Kevin Lynch)*

danger, its pride in special skill, its migrant nature and its personal links, it resembles the medieval wandering crafts of builder and smith.

Demolition is usually an afterthought, a minor event between site acquisition and new construction. Yet it steadily becomes more difficult, due to the greater restrictions placed on it and to the swelling use of materials and forms that are either intrinsically difficult to break up—such as reinforced concrete, or tall buildings—or are so new that there has been no prior experience with their demolition. Demolition contractors plead that building

designers consider the eventual break-up of their fabric, and file specifications for its dissolution as well as its creation. Since these pleas are not heeded, wreckers face unpleasant surprises. Unpleasantness may also arise from the previous use of a building. One old London house, of a type quite easy to tear down, proved to have been at one time a factory for painting luminous clock faces. It contained 50 million curies of radiation, and the demolition costs soared to thousands of pounds. There were unexpected problems, such as the risk to the public of any small object stolen from the site while the building was coming down.

Salvage

Some communities have acted to increase the recycling of building material. Baltimore, for example, operates a public salvage depot that stores decorative material collected from city-owned buildings being demolished. Any city residents engaged in restoring their own homes can buy these items at cost. New York has created a similar cash-and-carry operation that saves pieces from 150 buildings per year, or about 10 percent of those torn down each year. This public depot focuses on the more prosaic external parts, leaving the high-value internal items to exploitation by private dealers.

Specialist firms hold large stocks of fine interior elements. One firm in Portland, Oregon, acquired much of its stock from old New York houses and transported it across the country for reuse in the West. Stanford White, the fashionable 19th-century New York architect, picked up the mantelpieces for his expensive houses in the wreckers' yards of the East River. The Anonymous Art Recovery Society (the so-called "gingerbread snatchers") has been collecting building ornaments from wreckers and dumps in New York for 20 years, and has a permanent showing in the Brooklyn Museum sculpture garden. As the market for these items has developed, demolition supervisors, who used to give the stuff away, are now alert to sell it.

Other firms save and stock more mundane items. There are over 200 wrecking and salvage firms in New England alone. A typical yard and warehouse of this kind has extensive sheds full of old plumbing, brick, doors, windows, and miscellaneous hardware. Much of this is the residue of the 1950s, which were boom years for rebuilding, and yet also a time when it was still profitable to wreck and sort by hand. With the speed and

See figure 60

mechanization of contemporary demolition, it is now much less advantageous to salvage. The typical firm is reduced to wrecking small houses, or to stripping easily salvageable parts as an initial step in larger jobs. Meanwhile, their stock of older pieces continues to rise in value.

But if one is willing to undertake the hand labor, and risk the danger, then old buildings have much useful material, particularly lumber and brick, in addition to the usual special salvage items, which are commonly taken off only in the first stages of building removal. Some young builders become "demolition addicts," finding a pleasure in tearing down, and an equal pleasure in rescuing and reusing secondhand material. After the experience of using old wood, they say the new wood seems raw, and without character. Gathering their material first, they design a building that takes advantage of what they have. Thus the new building acquires a certain patina, a particular character and sense of history. They cruise the city, spotting reusable material in alleys, trash boxes, construction and remodeling sites, dumps, beaches, and disaster areas.

Marks of Time

Great Britain's Building Research Station has issued several technical bulletins on the weathering and deterioration of building material.[3] In perusing the numerous illustrations in these bulletins, it is interesting to see how weathering increases the expressiveness of old surfaces. "Counter-shading," for example, is a process in which dirt drifts down and is deposited on upward-facing surfaces. This gives an unexpected effect of light projected from below, highlighting detail in a dramatic way. Hidden structure is exposed by stains. Rains streak the surfaces. Projections, equipment, or adjacent buildings cast permanent shadows, as in the phenomenon of "shuttermarks." Cracks and discolorations appear, and differences in tone and grain are exaggerated. The orientation of a wall to wind, rain, and sun is expressed in differential weathering. The research station sees these phenomena as defects, and yet they confer a richer, more particular character. The well-modelled surfaces of older buildings seem to take these traces more happily than those newer skins whose esthetic it is to be smooth and clean. On the latter, a streak is a disfigurement. Some metals, like copper, oxidize attractively; others, like aluminum, are dulled by time. Brickwork mellows with age, unless it should effloresce. Timbers darken or silver, and become eloquent

See figure 41

of grain. But concrete cracks and discolors in meaningless forms. Might materials also be chosen for their qualities in old age, and surfaces be detailed so that the marks of time make them more expressive and diverse?[4]

Vandalism

Vandalism is more powerful than weathering. Like demolition, it creates waste deliberately. Vandalism first meant the willful and ignorant destruction of beautiful or venerable things by invading barbarians. Now it means the willful destruction of any property. It is widespread, but not meaningless, and may arise in varied circumstances.

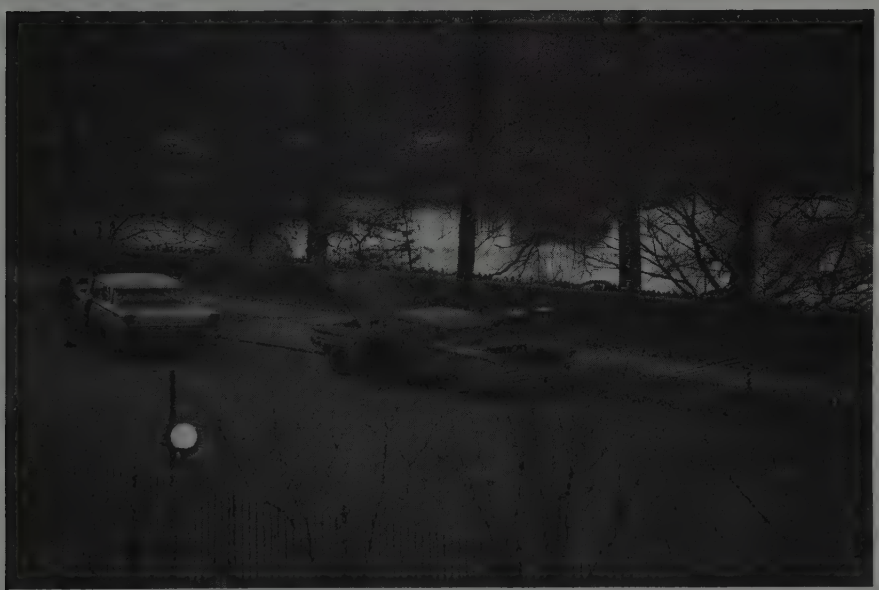
At times, vandalism is the by-product of an illegal livelihood gained by the stripping and resale of valuable parts. Occasionally, it may be the unintended by-product of mere play, of exuberant action. More often, it is deliberate destruction, aimed at a person or institution that has injured the vandal. Or it is part of some large struggle, and so it is "sabotage." Most often—and this is the motive that both fascinates and frustrates the nonvandal—it is an intentional act not directed toward any definite end: the expression of a generalized hostility, or of a sheer pleasure in destruction. Therefore, it is called "mindless." But it is not mindless. It is quite mindful, and because of that, quite difficult to prevent.

Especially for those young males whose future is restricted and meaningless—but also for other similarly placed groups in society—vandalism is just the ticket, the ideal form of rule breaking. In a world that seems indifferent to their existence, vandalism is expressive of their feelings, and also instrumental, since by its means the world is forced to respond to them. There are risks, which add a spice of danger, but the risks are not great. The familiar and alien environment is restructured and played with according to the vandal's own rules. Mostly absent in traditional, controlled societies, or in those that are in hopeful transition, vandalism is present throughout the relatively affluent world, both capitalist and socialist. Some vandalism is condoned ("students will have their fling"), or it is hidden within institutions, where it is expected and provided for. Elsewhere it is a common scandal.

Vandalism is more likely to be inflicted on public or institutional property, where the owner is an impersonal "they." Like litter magnets, places are more likely to be vandalized when they already exhibit signs of dilapida-

tion, low supervision, or uncertain ownership, and when repairs are not made quickly. Vandals are attracted to things that smash well, like glass, or are easy or valuable to strip, or are intended to frustrate their action, such as a fence or bar. Vandalism is usually the work of 10- to 12-year-olds at play, or of disaffected older adolescents. However, there is no "vandal type." Juvenile vandalism has one of the lowest reconviction rates of any offense. In one study, it was the only unfavorable child symptom that was not predictive of any later personality disturbance or psychiatric disorder[5] (which I am pleased to hear, having smashed some street lights in my own time).

An experiment by Philip Zimbardo vivifies these acts.[6] He left an automobile at a curb on a street across from the Bronx campus of New York University. It had no license plates, and its hood was raised. He then observed events by means of a hidden camera. Within ten minutes the first strippers had attacked the car, and within 24 hours they had removed battery, radiator, air cleaner, radio antenna, wipers, chrome strips, hubcaps, tires, jumper cables, gas can, and car wax. The strippers were



26 Signals stimulate vandalism. In an experiment, a car left at a curb in the Bronx without license plates and with its hood raised was progressively vandalized by well-dressed whites. After 3 days it was rendered worthless and became a receptacle for other waste. *(© Philip Zimbardo)*

well-dressed adult whites, the saprophytes of the city streets. In the next 9 hours, young people commenced the random destruction of the car, first smashing the windows. In three days, the car was a battered hulk, no longer worthy of attack, but in use as a receptacle for other waste. Up to that point, almost one-third of those who passed the car had attacked it in some way.

In contrast, a similar car was abandoned in an affluent area of Palo Alto, California. In over a week, there was no incident. One passer-by closed the hood during a rain. At that point, the experimenter forced the issue. He directed his students to strike the car with a sledge hammer. They began sheepishly, then were carried away by delight. Observers joined in. Once battered, the car was prey to vandals in the same progression as before. Signals release the vandal activity, and they must be stronger where social control is stronger. First the car is stripped, then smashed in easy ways, and then with difficulty. Finally, it is ignored, except as a target for other waste.

Vandalism can be dealt with in different ways. It may be accepted as inevitable, an expected deterioration, a reminder of the need for regular repair. Repair must be prompt, or the place is broadcast as not being under control. The glass in a deserted building is very quickly broken out. The alternative is to harden or to police the environment, to prevent destructive acts. The costs of policing or hardening may easily be higher than the costs of repair. Moreover, the vandals, being human and ingenious, will find ways to circumvent the hardening. They may even be stimulated by it, and will show how they can bend steel and shatter concrete. A counterstrategy, therefore, is to tenderize a place, making it fragile and soft in hope of deflecting the feelings of malice. This is risky, but at times it works, especially when maintenance is impeccable, and particularly if local people had a hand in the making of the place, and thus a stake in its protection.

Retribution is still another response: jail terms, fines, or commitment to labor teams sentenced to clean and repair the damaged environment. In the latter case, some of the costs of vandalism are shifted to the vandals. Yet, except in the case of adults engaged in stripping the environment for its valuables, retribution may do little to deter. Vandalism for noncommercial ends is largely committed by groups of young people on unpremeditated

occasions, when the threat of future punishment does not have great weight. "Public education" efforts have very little effect. The vandals themselves are not moved by such appeals, which do little more than heighten the general public awareness of what is going on.

The only remaining strategy is to move against the causes of the phenomenon. But since the phenomenon is as plural as its causes, strategy must vary according to circumstance. Where vandalism is the stripping of parts, then one must deal with the market for parts. Where it is sheer play, then there must be better scope for the activity of children. Where it is vindictive, one goes to the sources of conflict, to see if mediation is possible. But where it is a product of generalized frustration, as it so often is, the only direct solution is to deal with those features of school, family, or economy that create that alienation—not an easy solution. Here one may be tempted to agree with Bakunin that "the urge to destroy is also a creative urge"—to see vandalism as a healthy reaction in some ways, a rebellion of youth against a society to which their parents have become resigned.[7] There is no need to romanticize this, to fall in love with violence and grafitti, in order to look for the roots of vandalism and to think of ways of turning that force and skill to creative ends. There are times when the vandalized place may itself be part of the solution, if the vandals can be given a responsible and challenging role in making and protecting it.

Abandonment

Inner-city housing is being abandoned at an increasing rate. Almost 5 percent of all U.S. inner-city dwelling units are now boarded up. In New York City alone, 59,000 buildings containing 700,000 apartments are in tax arrears, and presumably on their way to abandonment. Deserted buildings are not new in history, but in the past they retained some value, and were held for a favorable turn of the market. Now vandalism, demolition, and arson are destroying this potentially useful stock, and destroying whole communities in the process. The city of St. Louis is an extreme case: over 8 percent of its housing was vacant in the 1960s (compared with less than 2 percent in the 1950s), and 17 percent of its entire supply was demolished in that decade. The steady long-term improvement in the housing of low-income families in this country may have been reversed some time in the 1960s, despite the continued rise of real incomes. There has been a surge of

deterioration and abandonment in the existing inventory to which these families are confined. In consequence, inner-city, low-income tenants living in substandard quarters pay roughly the same rents as outer-city, moderate-income tenants living in standard housing.

Sporadic abandonment occurs in relatively sound inner areas, as operating costs rise due to vacancies, arrears, insurance, utility costs, and misuse or mismanagement. Returns on capital fall below savings bank interest, or even down to negative cash flows. Vandalism or accident may initiate the process. Fearful, confused owners refuse to invest in rehabilitation, even where it could be profitable. Absentee but amateur landlords are particularly prone to this irrational course. It happens more rarely under experienced, large-scale management, or where structures are owner-occupied.

When sporadic abandonment accumulates, it may become contagious; expectations shift, professional vandals begin to operate, and landlords turn to arson. When their properties fall to zero value, landlords have them torched in order to collect the insurance, before giving them up. Lives are lost, and personal possessions are destroyed. Insurance rates rise, and buildings which by minor repairs could have been made useful again are rendered unsalvageable. Wasting accelerates. Whole inner areas may be cleared, as if by a forest fire, or urban redevelopment gone wild.

Teenagers break into closed buildings, to use them as clubhouses. They set fires and initiate water damage. Local junk dealers facilitate wasting by fencing stripped hardware, metals, and fixtures. Troubled families, unwanted elsewhere, are dumped into these unfavorable areas, and responsible tenants move away if they can. A basically sound housing stock, capable of modest repair, is reduced to lines of gutted shells, as if it had been subjected to aerial bombardment. The last available response is to accelerate the process and clear the land—perhaps to leave it empty, perhaps to build on it once more. In 1979, New York City, having some 10,000 buildings foreclosed and beyond salvage, asked the U.S. Army for troops and military technicians to help demolish these structures—a one-time effort to sweep away the backlog. But the army was dubious about diverting its men for the task, and the building unions resisted.

There are public programs that encourage the reuse of these abandoned structures. One is the popular "home-

steading" procedure, in which tax-abandoned houses are sold by the city for nominal sums. With a subsidized loan, the new owner then rehabilitates the house, which thus is returned to use and to the tax rolls. The prospective owner-occupier must repair and move into the house within a given time in order to perfect his title, which is the analogy with the historic "homesteading" of the public lands.

This has been a reasonably successful, if small-scale, means of recycling sound single-family units in desirable close-in areas. At times, it has initiated a more general upgrading of a neighborhood, as the well-to-do begin to move back in. Originally intended to ease the housing crisis of the poor via the use of their own "sweat equity," it has more often been used by young middle-class families, who have the physical energy—and also the capital, leisure, and skill—to work on their own house.

Vacant buildings may also be rehabilitated directly by the city, for resale or for low-income rental. Baltimore recycles some 350 units per year by this practice, and no longer demolishes any vacant house unless it is structurally unsafe. Whole abandoned blocks are boarded up, fenced in, and so stockpiled until they are in demand. It is not clear whether such recycled units are cheaper to produce than new units, despite the obvious social advantages. The costs are obscure, since it is difficult to disentangle the effect of the multiple public subsidies involved.

In Portland, Oregon, old but sound houses scheduled for demolition are now regularly purchased and moved to new locations on inner-city vacant lots, where they resume their useful life. Moving houses was quite common, in a day when their value was high relative to a normal income. The old houses of Martha's Vineyard were shifted from farm to farm by ox team as new families were formed, and the barracks of Camp Meigs in Boston—the training camp for the first black regiment in the Civil War—were later sold for a token sum and moved to scattered lots in Hyde Park as houses. Several of these were still in use in the 1920s.

Apartment houses, once abandoned for taxes, have been more difficult to put back into service without a major public investment. Private capital is difficult to enlist. If put up for sale, they are picked up by speculators at low prices in public auctions. They are milked briefly for current income without further investment, and then

27 House moving, once a common activity, is reappearing in some cities to provide affordable inner city housing. *(© Rajeev Bhatia)*

abandoned once more, now in a far more degraded condition. Although buildings can be moved or repaired, and to some extent their material can be recycled, it is difficult to remanufacture them, since even today they are not usually the product of an assembly line, and their components are not easily separated. Might it be possible, however, to apply that idea to the mass-produced trailer, or "mobile home," which so quickly loses its value, and which begins to be abandoned as obsolete in increasing numbers? Could mobile homes be designed with such reprocessing in mind?

The disposition of publicly owned real estate unwanted for public purpose has always been controversial in this capitalist nation. Should the city or federal agency return the property as quickly as possible to private use, thus realizing what it can, renewing the tax base, and relieving itself of an embarrassing administrative burden? Or should it do so only with deliberation, making sure that there is in fact no public use in prospect, and controlling the private use to achieve some desired community outcome? Or might such properties be left in public ownership, to be used for some subsidized purpose, or even for rental income? As public land falls out of use, and especially as tax delinquencies multiply, these real estate leavings pile up. In some central areas, outside of the central business district itself, governments are being driven towards socialization of the land. By our ideology this is a fearful outcome, and yet it may prove the most workable alternative.

Urban Decline

In recent times in the United States, there has been a marked decline in certain entire urban areas, a process backed by our high mobility of capital and young labor, and our historic custom of moving on. Europe, on the other hand, has shown a less marked decline of its old cities, due to repeated public interventions and to the national barriers against free population movement.[8] Mobility means freedom, and efficiency in the use of resources—at least in the short term. The 1980 President's Commission for a National Agenda proposed that national policy should encourage this mobility, rather than seeking to check it.[9] The poor should be given incentives to move to where the jobs are, to go from Rustbelt to Sunbelt. Older cities should be allowed to shrink. Present subsidies to declining places, in their opinion only trap the poor, since they tempt them to stay and survive, when they might move and prosper. Moving on and abandoning things is the American Way, the expression of our free spirit.

In 1975, Edgar Rust studied the declining metropolitan areas of the U.S.[10] He found an increase in metropolitan areas with less than 1 percent population growth in a decade: from 5 in the 1940s, to 10 in the 1950s, and to 26 in the 1960s. Between 1970 and 1972, 27 actually declined, and the trend has since become more marked. The shift from the north to the southwest is common talk, but in fact these losing areas can be found in any section of the nation.

Typically, a city in decline is one that boomed in the past, dominated by a single economic activity in which it specialized. When that activity faded, or found a more advantageous locale, the city failed to shift to new enterprise. At times, decline was reinforced by some major disaster—fire, flood, or earthquake; or by the loss of some transport connection—canal, port, or railway. The original boom may have been founded on commerce, on servicing westward settlement, on resource extraction, heavy industry, military procurement, consumer products and services, or even, as at present, on the attraction of some preferred climate or landscape.

The larger administrative centers, with their multiple economic bases and concentrations of headquarters offices, remain stable in this flux. Headquarter locations monopolize capital and skill, and can afford to hold on to them in hard times, or to take the gamble of a shift to some new activity. They sit at the major nodes of transportation systems, so that they are not easily isolated. Administrative functions tend to persist. Moreover, a tradition of civic pride may have encouraged businesses to invest in the public environment in flush times, leaving a heritage of amenity that continues to hold their skilled people in times of adversity.

Rust finds such migration influenced more by pull than push. High wages elsewhere attract the skilled and mobile young. The old and the poor stay behind. If ownership is centered elsewhere, it is relatively easy to disinvest in real estate by withholding maintenance and taxes. Such capital can be written off in a few years, and the plant closed without loss—without loss to the entrepreneur, that is. Public services must continue to serve a diminished clientele in the old place while they are duplicated in the new. Social ties are disrupted as the young disperse and forsake the old. The remaining labor force is committed to work. Populations and public capital cannot match the free flow of private capital.

The mismatch is sharpened when the first economic boom in the new city, marked by an influx of the young, is followed by a second population boom, as the young newcomers raise their children. If this second boom is not met by continued economic growth and the creation of new enterprises, then these children leave when their time comes, and the area goes into a sharp decline, ages rise, incomes level off, and risk capital goes elsewhere.

This is followed by a protracted secondary decline, marked by underemployment, falling incomes, increasing nonlocal control of activity, risk-avoiding management, restricted access to new ideas and markets, a shortage of trained professionals and managers, and a diversion of public expenditures to the shoring up of specialized but obsolete activity or to the attraction of transient, low-wage firms. Large corporations locate their low-skill branch plants in such places: the very plants that are most sensitive to future economic swings. Young people are educated at local cost, and then depart. Resignation replaces the earlier attempts to respond to the challenge of the first decline. There is a long stagnation, a resistance to change, until people, things, and institutions have eroded sufficiently to permit a new turn, or at least to establish an equilibrium at some lower level.

Declining areas have their own values: low housing costs, less crowding, and a relatively placid, stress-free world. Church, family and ethnic ties are strong, even if the mature children are gone. But the environment is likely to be of low quality (with a few splendid survivals), and expectations and self-esteem are depressed.

Public policies that treat of decline as a local disease, or come too late, or encourage growth in other places, can be ineffective or damaging. Typically, significant efforts are rarely made to address decline at its roots: to create flexibility and diversity at an early stage; to invest in the public amenity that will stabilize a place; to compensate for the social costs of mobility; to put the control of enterprise in local hands; to capitalize on the hidden benefits of stability, stagnation, and decline.

If the government is serious about responding to the mismatch of people and capital, then it must propose far more radical actions: the transshipment of entire communities, and not just the mobile young; the invention of transferable infrastructure and institutions; and a humane closing down of abandoned settlements. Such a policy could be an interesting speculation. It might even be rational, if expensive and politically distasteful. At least, it would make evident the hidden costs of uneven growth.

Dereliction

Derelict land is even more extensive than derelict building. Derelict land is often defined as land so damaged by development that it is incapable of beneficial use without further treatment. Note that this definition excludes

land abandoned because of changes in the market, like an empty millyard; land that is simply unpleasant or dangerous; and land naturally unusable or made so by natural cause. If it pays, it isn't derelict. If it doesn't pay, due to some human devilment, and once did pay, then it is derelict.

Surface and subsurface mining creates much land of this kind. It may destroy topsoil and vegetation, leave pits and holes, cause subsidence and flooding, and pollute the ground with brines, spoil heaps, acid wastes, and slimes. Modern mechanical mining may accelerate this dereliction—causing deeper subsidence, or more extensive gashing—since it works to greater depths at greater speeds, and it discards larger percentages of waste piling in taller, looser heaps. Some manufacturing processes, such as steel works, smelters, power plants, gas works, or industrial chemicals, also pollute the land with their

28 The Bingham copper mine near Salt Lake City is the largest surface copper mine in North America. It covers 1,050 acres and contains about 175 miles of railroad track. After the copper has been mined what might be done with the excavation? *(The Bettmann Archive)*

deposits of ashes, slags, metals, chemical wastes, radioactive material, and other toxic substances, as well as by their massive foundations and utilities. At the same time, there have been technical advances in land reclamation, using heavy earth-moving machinery to reshape the waste heaps or recover the strip mines, and new methods for reestablishing vegetation by drainage, rebuilding the soil, and progressive planting of selected species. Reclaimed sites need 20 years to mature to a stable state. Meanwhile, they still *appear* derelict, and so may continue to attract illegal dumping, and the destruction of their cover.

Some wastes can find an economic use, such as ashes for fill or for building blocks, or slag for road metal or for fertilizer. On occasion, therefore, it may become profitable to rework the old waste deposits, as recovery techniques improve or raw material prices rise. Or the disturbed land form itself may be made useful: old pits and quarries may be converted into recreational water bodies, for example. Many other wastes are persistent, and difficult to rework or detoxify. Radioactive materials are notorious. Chemical slimes must be held indefinitely in expansive ponds, always liable to accidental release. The soft residue of the Le Blanc process for making soda and potash has remained a noxious presence for 60 years. The extremely deep pits made by china clay extraction are difficult to refill. Old waste heaps may collapse, as happened in the Aberfan disaster. The contour mines and waste reservoirs of Appalachia are unstable: they slip and block water courses, or release sudden floods, as occurred at Buffalo Creek in West Virginia. (The buffalo having been wasted long before.)

See figure 83

Abandoned Transport

Abandoned transport also results in derelict lands, but these will more easily find new uses. Railroad closures have left substantial mileages of unused lines which turn out to be useful secondary recreational routes. The old city terminals and yards, being extensive and close-in, are valuable for urban development. The old canals, especially in Great Britain, have proved ideal for pleasure boating.[11] Some remote bulk seaports are truly derelict, but the old urban waterfronts from which modern container shipping has largely receded are now prime development sites. The wartime airfields of Great Britain, predicted to become permanent scars, are now largely returned to other uses. Runways are mined for aggregate, broken up, and returned to fields, or used as farm roads

and hardstands. Roads themselves rarely become derelict. They continue to be used for access, although some of their structures, such as our recent elevated highways, may in good time have to be torn down. Any connected spatial network, once acquired, continues to be useful for many modes of flow: trains, pipes, cars, cycles, horses, wires, walkers, canals, whatever. When Los Angeles abandoned its extensive street railway system, it also dismembered the rights-of-way. The city has had ample occasion to regret the miscalculation.

The Great Wasters

Once their lords have been banished, the domains of the great space wasters—the kings, armies, and extractive industries—can become the parks and gardens of their humble successors. The arrogant dead enrich the ground. In American cities, the former military reservations, along with old railroad yards and dumps, are a primary source of renewable land. The city parks of London are there because the kings reserved hunting grounds next to their palaces, once a very inefficient use of city land.

War and the sudden exploitation of resources are champion wasters. Entire regions are ransacked and emptied; vast works are built for brief use. In his history of the Mediterranean, Braudel tells of the constant building, demolition, and rebuilding of fortifications.[12] Warfare evolved rapidly, and each new fort was obsolete when completed. To build city walls entailed a gigantic civic effort. Then they became an awkward encumbrance, then a mine of material, and finally, once they had laboriously been levelled, a valuable open space or circuit road. Our own war materiel still litters the islands of the Pacific. The barracks of the two world wars, and of our Civil War, were, for their time, a principal source of secondhand lumber and used buildings. A substantial surplus of temporary buildings from World War II still waits to be demolished or reused. The MX missile scheme as first planned would have wasted 4,000 to 8,000 square miles of ground, or about 1 percent of the area of the eight Great Basin states. By past experience, it would soon be obsolete, or if useful, would then make *us* obsolete. What would it or our remains be useful for?

The Industrial Revolution began in Great Britain, and industrial waste has accumulated there to greater depth than in any other nation. It was only in the 19th century, however, that the industrial scale enlarged sufficiently,

29 Freeway interchanges and buffer strips waste enormous amounts of land. *(© William Garnett)*

and abandonment became frequent enough, to create substantial derelict areas. As the century wore on, the wasting rate went up, greater damage was accomplished by more powerful machinery, and land subsidence began to occur. After 1920, old mines and plants closed on a significant scale, and open-cast mines became common. After World War II, closures accelerated, and derelict land appeared as a national problem. Some 2,000 hectares of derelict land are still being created every year, a rate that is 300 hectares greater than the rate of reclamation. Only some 0.3 percent of the national territory is derelict, but this incidence is more severe in some places: 1.8 percent of the area of Cornwall, for example, or up to 13 percent in some local areas.

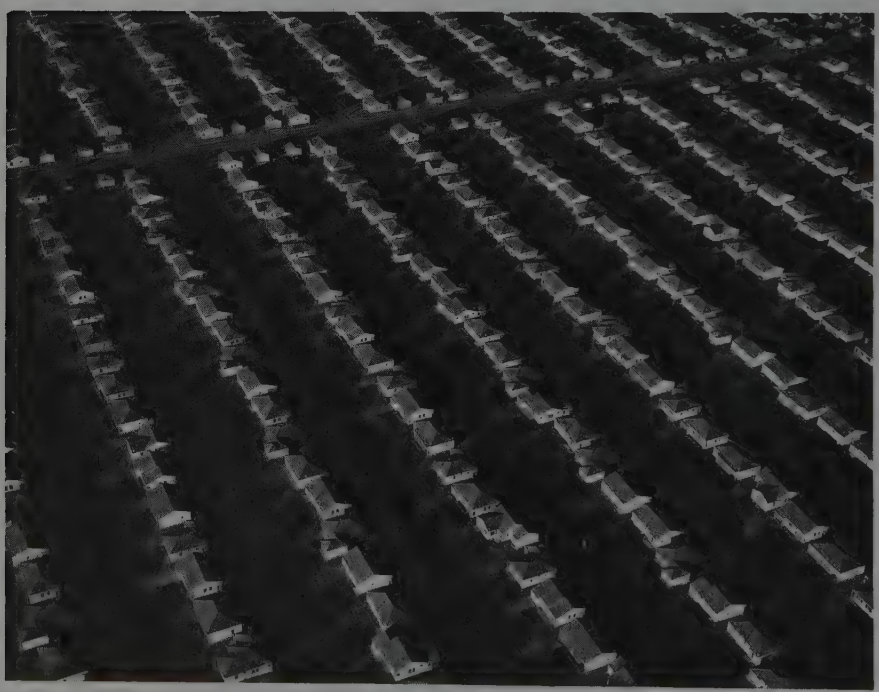
See figure 40

In most U.S. cities having a population of more than 100,000, 20 to 25 percent of the land is vacant. Of this vacant land, 20 to 25 percent once again is unbuildable, due to size or shape, or to slope, instability, or flooding. Some of the remainder is in confused ownership, but most of it is held for speculation, or as an institutional

or corporate reserve. If this "waste" land could be utilized, it would relieve the development pressures at the city fringe. These half-deserted inner cities are visual symbols of despair. They color our view of city life. On the other hand, it is easy to find sites for new public facilities, and there is room for the activities of children. The tightly planned and rapidly built new suburb might be an example of too little waste. It constricts the individual, and fixes the pattern of activity for a generation. Thinking of the resources that its construction consumes, and the emptying of the older stock that it induces, large-scale new building may simply be another manifestation of the empty center. In a well-known article on "scatteration," Jack Lessinger points out the values of scattered growth, with its plentiful holes for later infill.[13]

Regulation of Derelict Land

Great Britain and West Germany, scarred so early by industrial development, now carefully regulate the production of derelict land. They require that strip mines recover and revegetate as they go, and that deep mines



30 The modern compactly planned suburb may have too little waste space. It lacks outdoor spaces for adventure and exploration away from public scrutiny. *(© William Garnett)*

replace their wastes underground. In the United States, on the other hand, there is very little control of such activities. Surface mining produces an estimated 500,000 acres of abandoned land each year. Unfortunately, it is doubtful if the reclamation of this land for agriculture or forestry is economical, unless the cost is borne as an original cost of production. It is usually cheaper for the mining enterprise, if left to its own accounting, to pay damages for subsidence or simply to buy the land and throw it away once mined, than it is to take the action necessary to restore it to its former usefulness. In a present-oriented, strictly economic evaluation, it will be cheaper to increase agricultural or forest production simply by upgrading the undisturbed land that remains. Reclaiming derelict land for dense housing, urban recreation, or industrial use, on the other hand, is more likely to pay off.

Despite the new practices, the complete reclamation of all the derelict land in Great Britain would require, if accomplished over the next 20 years, a public expenditure of about one-half of all the public sums spent on housing and environmental services—a staggering bill. One is cynically tempted to let the underdeveloped countries do our mining for us, preserving the amenities at home while they cope with our degradation.

Such analyses take no account of the long-term consequences of the loss of arable land, nor of the satisfactions to be derived from a handsome landscape. Reclamation is as often motivated by community pride as by economic calculation. In some cases, the waste heaps themselves are historic landmarks, to be reshaped and reclaimed but not to be removed. Indeed, some historians fear that wholesale land reclamation risks obliterating our industrial past. Much of the 19th century industrial dereliction has with time become romantically attractive.

Wastes of Successive Occupations

Landscapes shift from one function to another, are abandoned and reoccupied, take on new forms, revert, and occasionally are changed irretrievably. The wastes of successive occupations accumulate and become part of the nature of the land. The European occupation of New England is a capsule example. From subsistence farms on newly cleared forest land, farmers turned to cash crops of wheat. In 1824 the wheat weevil arrived, and in 1825 the Erie Canal brought midwestern grain to the cities. A population exodus began, and the wheatfields were converted to sheep pasture. Removal of the wool

tariff in 1840 caused a shift from sheep to dairy cattle, and emigration was hastened by the loss of men in the Civil War. People moved down from the upland farms and towns to the water power, the railroad lines, and the meadows of the river flats. Later, the cows no longer grazed for themselves, but were fed in the barnyard, and so the upland pastures grew back to cherry, maple, blackberry, and alder: "puckerbush" in the local tongue.[14]

The farmers thought it was sinful to let those fields revert to the original forest, and yet the process continues, leaving stone fences and cellar holes in the woods, and a skeleton of narrow forest roads. "I sold the cows when the barn floor collapsed, loaned out one horse when its mate died, sold the sheep when the fences got too weak, and now I rent the tillage land and have a town job," recounted one Vermont farmer. "Somewhere in every New England mind there is an abandoned farm," wrote poet David McCord.

See Figure 48

Today, the landscape is being reconverted to recreation. The houses are going uphill and out of town again. The roads are reused, and the stone fences emerge once more. Land is cleared to gain a view instead of to raise a crop. Ski runs are cut down the steep slopes, and new commerical activities appear along the river-bottom highways. In time, future successions will again remake these highways, these new second homes, these narrow ribbons of rye grass cascading down the slopes. The landscape changes, accumulating historic waste.

The Maori

The Maori made garden soils over extensive areas of New Zealand by laborious digging, the addition of sand, weeding, and burning. Lands partially in grass were by fire converted to continuous prairies, unleashing severe erosion and silting the river mouths. Once these economic resources were established, they turned to war, built massive fortified settlements, and abandoned much of their garden land. Whole regions were depopulated and went back to waste. Many settlements were sacked. The flightless moa was slaughtered and driven to extinction, leaving bone deposits as dense as 800 skeletons to the acre. The Maori mined these sites for tools, and then the Europeans carted the bones to mills to make fertilizer. These ruins, boneyards, soils, grasslands, siltings, erosions, new and vanished species—along with the usual massive changes brought on by the European settlers—are all part of the productive landscape of New Zealand today.

Whole regions have been abandoned, and then reoccupied after lying empty for long periods. The arid Negev in Palestine has filled and emptied at least five times in human history. The Chalcolithic, Bronze Age, Abrahamitic, Judean, Nabataean, and current settlements have each been separated by a long vacant period. This is a difficult land; its use depends on careful water management. Its abandonment and reuse did not follow fluctuations in the climate, but changes in the social order. Raids and warfare emptied it, and external power refilled it, since any repopulation was dependent on capital, concerted effort, and security. The Nabataean water-capturing devices were especially elaborate: cisterns, terraces, dams, tunnels, and rock mounds on which dew could form. Much of this is still operable today, the wastes of an older civilization in a wasted land, a land being reclaimed once more.

Negev

Not all changes are gradual and reversible. The open roasting of copper sulfide ore in a single plant in southeastern Tennessee, stopped by legal action in 1910, destroyed the forest cover over an area of 25,000 acres by its emission of sulfur dioxide. Seven thousand acres of this land is still desert, and is eroding in the heavy rains; the remainder has been converted to permanent grassland. The Salton Sea is another such human artifact, carried out on nature's ample scale. An illegal canal, built to Mexicali to prevent flooding in the delta of the Colorado, through miscalculation overflowed into a part of the Imperial Valley lying below sea level. The result was a permanent salt lake 30 miles long that drowned out towns and railroad lines. Now a recreation industry is based on that undrainable flood.

See figure 36

In other cases, we have silted up rivers and lakes, or driven species to extinction, just as the aboriginal New Zealanders did. The changes that men accomplish seem most thorough and irreversible when they speed some natural evolutionary process taking place at a more majestic pace: the erosion of continents, the extinction of species, the eutrophication of lakes, the changing of river courses. We can see a minor example in New York's Central Park. The Pond, a creation of Olmsted's plan, is now silting up, due to accelerated runoff from the open park lands and periodic disturbances of construction. This is a natural evolution for any pond, but with our help it goes faster. Now a debate arises: should it be restored to

Olmsted's artificial design as part of a "clean lakes" program, or be conserved as it is as a man-made "wetland?" It has a different smell, and its water is no longer clear, but it harbors new plants and new bird species. It is pollution, decay, and new life.

But this is small stuff. Lately, we aspire to acts more nearly divine: the contamination of the seas or of the global atmosphere, or the deposit of radioactivity for the ages.

The Persistence of Cities

Abandoned cities—as distinct from derelict lands and ghost villages or small towns—are not as numerous as one might think, despite the vivid role their awesome ruins play in our imagination. Babylon, Nineveh, Chan Chan, Troy: the names of lost cities are magical and nostalgic. But if we analyze the listings by Chandler and Fox of those ancient cities founded between 1360 B.C. and A.D. 620, we find that out of a total of 69, 31 survive today.[15] A 45 percent survival rate, across a time span that now averages over 2,500 years, is hardly a sign of evanescence. (If their listing is incomplete, the actual survival rate may be somewhat lower.) If we look at their more complete listing of cities built in the last 1,000 years, and count only the mature, major settlements—that is, all those that reached a size of at least 40,000 before 1900, or, in continents other than Asia (where larger cities appeared earlier), of at least 20,000 before 1600—we have a list of some 905 places. Of these, only 30 do not exist today, and 21 of the 30 were in Africa and the Americas, where the failure rate was near 10 percent. Moreover, only 20 of the remaining 875 survivors have dwindled to populations of below 5,000. Urban settlements seem to have sticking power, despite (could it be because of?) the concentrated wastes they generate.

Isolated disasters have not often caused a permanent abandonment, unless they were natural shifts that destroyed the economic base (such as extensive soil erosion, siltation, or change in sea level, which destroy a harbor, or long-continued drought), or unless they were purposeful devastations, executed with malice and power. Above all else, settlements need to provide safe transport, and security from human predators. The principal killers have been war, disorder, and the shift of trade. Final abandonment comes only after a long series of disasters that exhaust the will and capital of the survivors. Knossos, the great city of Crete, was devastated by an earthquake in

1700 B.C., and rebuilt as large as ever on the ruins. After the terrible volcanic explosion of Thera in 1500 B.C., Knossos was rebuilt again, but on a somewhat lesser scale. Taken by the Mycenaeans in 1450, it was levelled once more by cataclysm and fire in 1400. When rebuilt this time, it was a backwater settlement, and yet the written records do not cease. About 1200, it was destroyed once more by the Dorians, and finally abandoned. Salamis, another Cretan city, whose necropolis is twice the area of the city itself, endured three great earthquakes, siltation, a Jewish revolt, and Arab pillage, before its citizens abandoned it, transporting the old stones to be rebuilt at Famagusta.

Antioch, in Syria, founded in 307 B.C., was one of the great cities of the Hellenistic and Roman empires. Its collapse into a small provincial town came only after a 100-year period that included: a great fire in A.D. 525, followed by recurrent outbreaks for six months; the earthquake of 526, in which 250,000 persons died, almost all the buildings fell down, ruins and corpses were ransacked by thieves, trade ceased, and citizens emigrated; aftershocks, and another major quake in 528, in which all surviving buildings and walls fell and 5,000 were killed; capture and sack by the Persians in 540, after severe street fighting, burning of the city and suburbs, and deportation of the inhabitants to Persia; bubonic plague in 542, and recurring outbreaks thereafter; earthquakes in 551 and 557, when the walls came down again; cattle plague in 557; bubonic plague again in 560 and 561; earthquakes in 557 and 588, with 60,000 killed in the latter; loss of all the olive trees, a vital permanent crop, in the drought of 599; devastation of the crops by weevils in 600; capture again by the Persians in 611, and evacuation by them in 628; capture by the Arabs in 638, after the collapse of Roman power in Syria. At that point, Great Antioch was at last reduced to a minor settlement.

Or consider Baghdad: sacked by the Mongols in 1258; suffered the great plague of 1348; taken by Tamerlane in 1393, and retaken in 1401 with a great massacre; reported to be in ruins in 1437, but taken by the Safavids in 1508, then by the Ottomans in 1534, and again in 1638. It underwent floods, epidemics, mutinies, looting. The city survived, and is a great capital today.

Systematic destruction of a city in war has perhaps been a more common cause of final abandonment than

31a, b It is difficult to kill a city, not only because of its concentration of physical structures, but especially because of the memories, desires, and skills of its residents. Like most parts of Warsaw, its old town square was severely damaged in World War II (a) but by 1965, 20 years later, it had been largely reconstructed, duplicating street patterns and facades as closely as possible (b). *(Polish Interpress Agency)*

natural disaster. Even then, a city is hard to kill, in part because of its strategic geographic location, its concentrated, persisting stock of physical capital, and even more because of the memories, motives, and skills of its inhabitants. The destruction of Carthage was an unusual success (although the site is now recommended for a new town), but the attempt to obliterate Poland's capital after the Warsaw Uprising was an instructive failure. The German army was ordered to destroy the city forever; no usable fragment was to remain. First, those who had survived the Nazi atrocities were evacuated. Section by section, the city was fired, to reduce its mass, and then blown up by demolition teams. A large, sophisticated military force organized a tremendous effort, over a period of several weeks. All the buildings fell, but a surprising amount of structure survived, both underground and at ground level. The very rubble of the explosions protected the remains, and blocked the movement of the fire and the demolition teams. Even more intractable was the consuming desire of the Polish people to restore their remembered city. So Warsaw reappeared.[16]

Atlanta was taken by Sherman's army in 1864; after a forced evacuation, it was burnt to the ground in two weeks of November. It had a population of 17,000 when the siege began, zero at the end of 1864, and 20,000 again by 1866, of whom 5,000 were widows. By 1869 it had reached 22,000, and was on its way to becoming a major industrial and rail center of the South.

If there is liquid capital, and society is organized to use it, rebuilding can be rapid, especially if the disaster is local and recovery has external support. The waste is quickly converted to fill or to new buildings. Like a homeless swarm of bees, there is surplus energy, and a strong motivation to remake the hive. Much depends on attitudes and on coordination: good communications, coherent values, and hope for the future. An economic boom is frequently set off by reconstruction, and in the end the physical plant is better than it was, and the economy at a higher level. Meanwhile, the stress reveals itself in personal relations, in bursts of nostalgia, in a resort to magic rituals, and scapegoating.

Disaster and Social Change

The explosion of a munitions ship in the harbor of Halifax, Nova Scotia, in 1917, killed 9,963 people, injured 9,000, and destroyed a two-and-one-half square mile area, causing $35 million in damage (1917 dollars). Previously,

Halifax had been a static provincial town, but the effort to recover from this disaster set off a chain reaction. A new port was built, the retail section improved, the hospital enlarged, a new health center and central park created, a new street railway built, and telephone connections were laid to the rest of Canada and to the United States. Other changes included an influx of workmen, a union of churches, a new housing commission, and important initiatives in city planning, zoning, medical clinics, and sanitary inspection. Women tram conductors appeared for the first time. There were also new neaurasthenias and frequent rumors. As with any social upheaval, people were on edge, without knowing why.

The structure of society is rarely revolutionized by these wasteful events, although particular social groups may gain or lose and social shifts already in progress can be accelerated. After the Black Death in Europe, which caused a loss of one-third to one-half of the population in some areas, there were pogroms, outbreaks of hedonism, and a dancing mania. Some impetus was added to the liberation from feudal society, in places where it was already under way. Prices and wages rose; land rents fell. Church and manor were for a time disorganized. There were revolts, and they were suppressed. In the end, the social shifts were additions to changes in process.

Inequities of Wasting

Not infrequently, however, inequities increase after a wasting, since disaster bears heavily on the poor, who have the narrowest margin of energy and capital with which to rebuild. New classes on the way up, on the other hand, may find special opportunities in the chaos. Observers who came to Managua, in Nicaragua, just after the earthquake of 1972 found that the worst burden of the recovery process fell on the poorest people, unable to rebuild, who suffered severe stress in very crowded living spaces. They were reduced to casual or part-time employment by the loss of the small center-city workshops. They were forced to move to the periphery of the city, from which the journey to work might be two hours each way. (After the Great Fire of London, in 1666, when the old City was rebuilt for the well-to-do, the poor were also driven to the outskirts.) The displaced Managuans had to learn new patterns of transport and activity since the old ones had been completely disrupted. They had lost contact with kin and friends, whose support they urgently needed. They were separated from the markets

for cheap food. There were too few hours in the day to cover the commute to work and the effort to reestablish social contacts. The city, meanwhile, spread out and became more segregated, peppered with vacant lots and heaps of rubble. The old center was cordoned off, and a new middle-class shopping district arose farther out.

To go back three-quarters of a century, the great San Francisco earthquake and fire of 1906 had similar effects. Within five years, the city was repopulated and regarded as rebuilt. But there had been an exodus from the old center. The city had spread out, and was more segregated by class. By 1915, the new housing on the periphery alone occupied twice the area of the old housing destroyed. The upper classes were quickly reestablished, but the poor were on the move for years. The journey to work shortened for the former, and lengthened for the latter. Low-income jobs were lost due to the destruction of loft buildings, and purchasing power fell as prices rose. The city boomed, and so did the divorce rate.

Other Places of Waste

Abandonment, dereliction, and destruction are not the only breeders of waste ground. There are uses not welcome in any settled community, but essential to the larger region. These include accommodation for people on the fringe of society in one way or another: halfway houses, mental hospitals, or low-income housing projects. There are also facilities that have some direct nuisance effect: highways, airports, truck and bus terminals, distribution centers, quarries, power plants, and heavy industry. There are some that need cheap quarters, or cannot or will not pay for public services: marginal industries, squatter housing, storage yards, and tax-exempt institutions. And there are the abhorred wasting facilities themselves: dumps, incinerators, sewage plants, and outfalls. Communities always applaud their location somewhere else in the region. We avoid them and yet depend on them.

In no contemporary new town in America, where every inch is planned, is there any provision for dump or burial ground. Indeed, there were very few cemeteries in the initial layouts of our 19th-century cities, although the churchyard had been a standard component of the colonial town. Now we keep death at a distance, and the thought that cemeteries are part of our disposal system is quite disturbing. We rarely enter them alive, except for the ceremony of interment. The old tradition of visiting

the family graves on special days of the year is fading away. Yet graveyards were once the parks of the city, places of quiet escape and social recreation. In a few cases, they remain so today. The vast cemeteries surrounding Cairo were used on holidays by everyone. Now they are squatter settlements. Our own park-building movement began with such landscaped burial grounds as the Mt. Auburn Cemetery in Cambridge, Massachusetts, and the Spring Grove Cemetery in Cincinnati. Today, a cemetery is the nighttime haunt of adolescents, who are also in many ways at the margin of society. Moreover, these graveyards are a refuge for wild fauna and uncultivated plants.

Urban Wilderness

Wilderness will develop in almost any untended land. The site of an old railroad station in the heart of West Berlin, once the largest passenger station in Europe, is now a rich landscape of ruined walls, tracks, and bridges, overgrown by thickets and wildflower meadows. The site, bombed out in World War II, contains examples of one-third of all the flora of the region, including rare and endangered species and some indigenous forms, but particularly the exotic urban ornamental run wild. Half of this will be conserved as a lightly managed city wilderness. Fitter describes a similar vegetative seizure of the bombed-out sites of London in his wonderful *London's Natural History,* and also discusses the influence of refuse disposal on the plant and animal life of the city.[17] Every fall, polar bears invade Churchill, Manitoba, to feed on its garbage. The economic base of this small town rests partly on the scientists and tourists who come to see the bears.

Urban wilds, cemeteries, and city dumps move farther and farther out, as settlement spreads. The quest for disposal room grows more pressing, and is more fiercely resisted by the outlying suburban towns. The acceptable location of the margin becomes a regional issue. The swelling inflow of goods and energy into the dense urban area makes it increasingly difficult to return the waste to any productive cycle, or even to put it down where it will not offend. It was this very concentration of resources in cities, of course, that first provoked the great wastings of war. Now, as the region continues to expand, wastelands reappear at the city center, in the form of vacant lots, boarded housing, junked cars, and exhausted slums. The rural poverty and rural waste heaps of the past are

being encompassed as underused land and marginal groups within the city itself. Remote or central, these wastelands are also the places where discarded ways of life survive, and where new things begin.

Within any city littered yards are used for low-cost storage and low-value activity, and fragmented, masterless spaces are used for disposal. Grady Clay has named them "sinks." Linwood Avenue, in inner Somerville, Massachusetts, is typical of such marginal areas. Isolated behind the elevated McGrath highway, it is accessible only by a single indirect entrance. Its low, repatched, concrete block buildings, spotted with signs, are closed in on themselves. These are warehouses, service industries, and repair depots. They stand within ragged dirt and asphalt yards, full of discarded objects. The broad streets, surfaced in cracked and oily paving, have no regular edges, but are sporadically lined with broken chain-link fences. Trucks and cars are double- and triple-parked, or nose into the yards. The workers are male, in rough and dirty clothes. An ugly, polluted, yet tolerant place, where the workers seem at ease (a remnant left by a carelessly

32 Urban "sinks," however unattractive, have their own values and delights. They are relatively free of social control and provide habitats where outdated things can survive and new ones may gain a foothold. *(© Michael Southworth)*

planned highway), it is a refuge for infant and relict enterprises. However unseemly, these urban remnants are also freer places, where one is momentarily relieved of the pressures of status, power, explicit purpose, and strict control. These shabby careless backsides, these rear yards, outhouses, and urban ratholes, have their own delights.

There is another, older example in the Boston region. From its early days, South Boston has been a dead-end appendage of the mother city—a vermiform appendix—into which the Irish were excreted. City lands on the north slope of that peninsula were used in succession for a dump, an almshouse, a lunatic asylum, and a jail. That the city persisted in loading its wastes on their territory was a constant source of "Southie's" anger. So as the Irish gained political power, they converted that city land into Independence Square, and pushed the unwanted uses farther down the hill. Now Southie has elected mayors of its own: the vermiform appendix has burst, in an electoral uprising of the local neighborhoods.

Just out to sea, the harbor of Boston and its multitude of islands, once used for safe pasture, became a dumping ground. The Nonantum Indians died there on an island concentration camp, and there sat the prison camps of the successive wars. Refuse was burned on one island for decades, and sewage still flows out into the harbor waters, laying down a thick deposit of bottom sludge. Today, the harbor islands are being converted to recreation, as the city slowly turns round to face the sea once more. But Long Island, central to the group, still supports its ruined fort, and a dilapidated hospital for alcoholics and the chronically ill poor.

See figure 53

Marginal islands are always fair game. Randall's and Ward's Islands in New York's East River were repositories for city refuse throughout the city history. They were the site of garbage dumps, potter's fields, and almshouses in the 18th and 19th centuries. By 1934, their occupants included a sewage disposal plant, a City Hospital for the Feeble Minded and Tubercular, a "house of refuge" of the Society for the Reformation of Juvenile Delinquents, the Manhattan State Hospital for the Insane, a military hospital, and the piers of an unbuilt bridge.

The elevation in Rome called the Testaccio was produced by the heaping up of broken containers that accumulated behind the port area of ancient Rome. This low, empty hill, for centuries known as "the field of the Roman

people," lay just outside the ancient city wall. In the 19th century, it also lay beyond the barrier created by the excavations of the archeological zone, and in the opposite direction from the city's growth. Here, in the 1880s, there was created a district for workers' housing and for the "*arti clamorose*": a brickyard, warehouses, gasworks, a central market, and various industrial and storage yards. It was Rome's first example of deliberate activity zoning, a kind of apartheid. Twenty years later, those tenements were desperately overcrowded; the streets were unpaved; there were no schools, clinics, or baths. The unbuilt lots were used for dumping trash and spoil. Infant mortality exceeded 50 percent. This was the area chosen in 1913 for building some of the first public, low-income housing in the city. Just as, back in Boston again, the swampy Columbia Point with its sewage outfall and its open trash heaps, lying on the edge of the city below South Boston, was chosen as the proper location for a large public housing project. It is a disaster area now being painfully recovered.[18]

Wastes are traditionally dumped at the edges of settlement—in areas where the powerless live, where land claims are weak, and where controls are soft. We find this phenomenon of the margin at many scales. In the house, things of small value are put in the cellar, the attic, or the garage. In a well-kept suburb, the compost heap, the brush pile, and the trash can are located at the lot line. When searching for the public dump or for nuisance industry in any New England town, look first along its boundaries with adjacent towns. An 18th-century manual on the founding of towns in Connecticut provides space for a ring of waste at a distance from the center of the settlement.[19] Just at the edge of Las Vegas, where the desert bergins, there is a notable belt of old tins and glass. Older cities were surrounded by rings of trash; the defensive moat beyond the wall was an ideal dumping ground. (Unfortunately, dumping in the moat not only rendered the water noxious, but made an easy path for a future enemy.) Nineteenth-century travellers give vivid descriptions of the mounds of rubbish on the fringes of Alexandria and Cairo. In our Southwest, the trash of the pueblos flows down the precipitous sides of the ancient mesas, a spectacular showing, against an ancient backdrop, of the goods of our industrial society. At the scale of nations, outlaws and unwanted people live in the border mountains, swamps, and islands.

The bayou country of the Mississippi delta is another example of the margin. These marshes are fringe areas both socially and geographically. It is a fluctuating habitat on the lower end of a great river system, always dependent on the state and management of that lordly water, at some times subject to too much water or silt and at others to too little; subject to the making and unmaking of delta land, to the intrusion of salt water or fresh, and to the catastrophic effect of violent storms from the Gulf. It has been the refuge of the Acadians twice dislodged, of slaves, of ruined French aristocrats and poor Chinese. Its economy whips about at the tail of outside markets; it jumps and stumbles with the demand for crayfish, oysters, shrimp, furs, oil, or agricultural land. The habitat is frequently overturned by the clearance, drainage, and abandonment of cropland, or by the careless introduction of nutria, muskrat, or water hyacinth. Its Cajun and Sabine people, anxious and uncertain, live a free and exploitative life. They plunder the marsh, as they are plundered by the outside world. They rapidly use up, and visibly discard, manufactured goods of all kinds. Abandoned equipment surrounds their shacks: generators, boats, refrigerators, stoves. Their livelihoods—principally trapping for fur, or the gathering of shellfish—create vast quantities of organic waste. Usually, this work is only seasonal or intermittent, a peripheral to some work in a nearby town. The bayou is a landscape of waste, the assend of a great river valley, a marginal place for marginal people. It has its own beauty, its own free spirit, and its people are fiercely attached to it.

A Tangled Mix

Wasting is a pervasive (if valiantly ignored) process in human society, just as it is elsewhere in the living system. It is a feature of the underlying flux that carries us along, the everlasting impermanence of things. There is a short-term wasting of objects, and a long-term wasting of place. Each has its own characteristics. The rate fluctuates, and the flow is cyclical or directed, depending on circumstances. It threatens our health, our comfort, and our feelings. It interferes with the efficiency of our enterprises. Still, it has its own values. If we seek to preserve things, it is a ceaseless threat. If we look for continuity and not permanence, on the other hand, then wasting might be turned to account. Rarely has any accumulation of waste caused the abandonment of a settled place, unless it has served to hasten some natural evolution.

Only occasionally has the environment been pushed to some truly irreversible dead end. Wasting has not usually caused fundamental social change, but it accelerates changes already under way, and shifts the distribution of burdens. It seems to us a tangled mix of good and evil, and mostly the latter. Hidden behind the polite facade of living its presence preoccupies us: it is an affair of the mind. Might there be pleasures in it, and practical opportunities? Could we be at ease with it?

CHAPTER FOUR

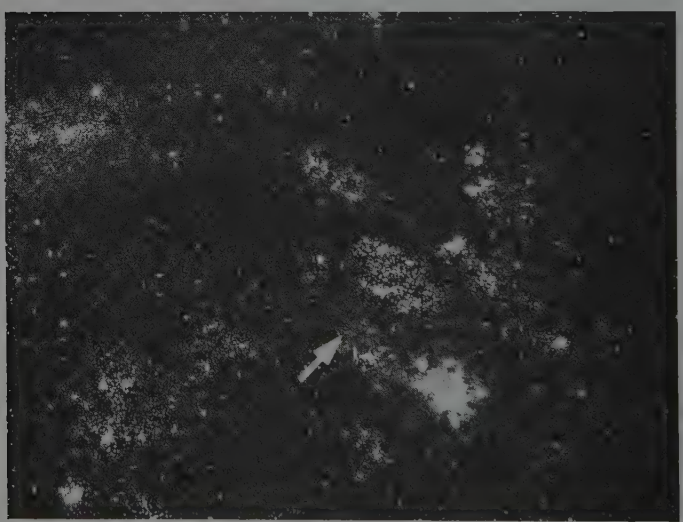
Looking at Waste

By Michael Southworth

We can see the processes of wasting all around us. In nature wasting often happens so slowly we are not aware of it. The ocean gradually eats away the cliffs and forests may die in the course of decades. *(33)*

NOTE: Photographic credits for this chapter appear on page 259.

Other wastings in nature are cataclysmic as with forest fires, earthquakes, volcanoes, or floods. *(34)*



Some are so remote in time and space they will not affect us and are perceived only with difficulty, as when supernovas explode thousands of light years away. *(35)*

The Salton Sea in California's Imperial Valley was a man-induced natural disaster. An ill-conceived canal project flooded thousands of acres of land, along with towns and railways, resulting in a 30-mile-long salt lake. Despite the destruction, there were some positive results. The lake is now a new recreational resource and has become home to new wildlife. *(36)*

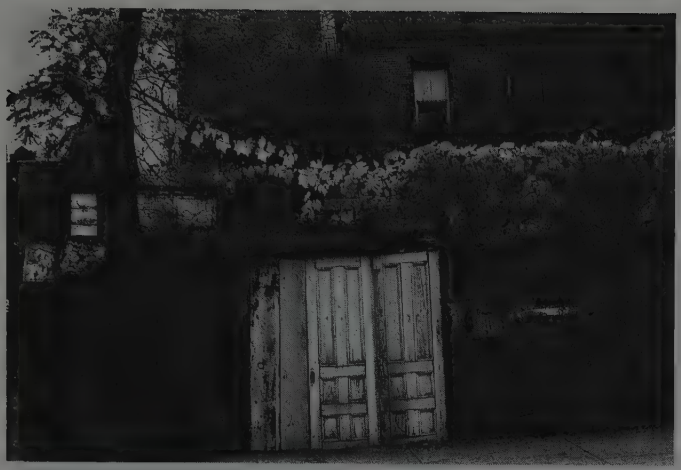
The waste treatment ponds of Arcata, California use natural processes to treat waste water. A dump, an old railroad trestle, and the remains of a lumber mill were converted to marshes that not only treat the city's waste water, but are a wildlife sanctuary, a salmon ranch, and a recreational area for hikers and bird watchers. *(37)*

Wasting in nature often has compelling esthetic appeal. Tourism peaks in New England as leaves begin to die and turn brilliant colors. *(38)*

Urban Wasting is sometimes as protracted as that in nature. The promontory that modern-day Arbil (ancient Arbela) in Iraq stands upon is actually the accumulated waste of the previous 6-8000 years of continuous habitation. *(39)*

Coal mining and pottery making dramatically shaped the landscape of Stoke-on-Trent with pits, mountains, and ridges of wastes. *(40a)* By mid-twentieth century no other county in England had as much derelict land, but beginning in the late 1960s much of it was reclaimed as open space and woodland. Spoil tips were reshaped and planted, and foot and bicycle pathways replaced the old railways. The reclaimed land now provides much-needed open space and a new and more positive image for the city. *(40b)*

Signs of urban wasting are obvious in garbage-laden streets and smog-filled air. More subtle signs can be found in the patinas of time, as wind, air, pollution, heat and cold make their marks on surfaces. In time these wastings become valued and are sought after by the photographer and preservationist. *(41)*



The intentional wastings of the litterer and vandal are less admired. The attentive observer can learn much about urban wasting in those places not intended for social use and display. Alleys and backsides expose a rich collage of unwanted and recycled things. The landscape is untended and follows its own course, revealing much about the life of the inhabitants. *(42)*

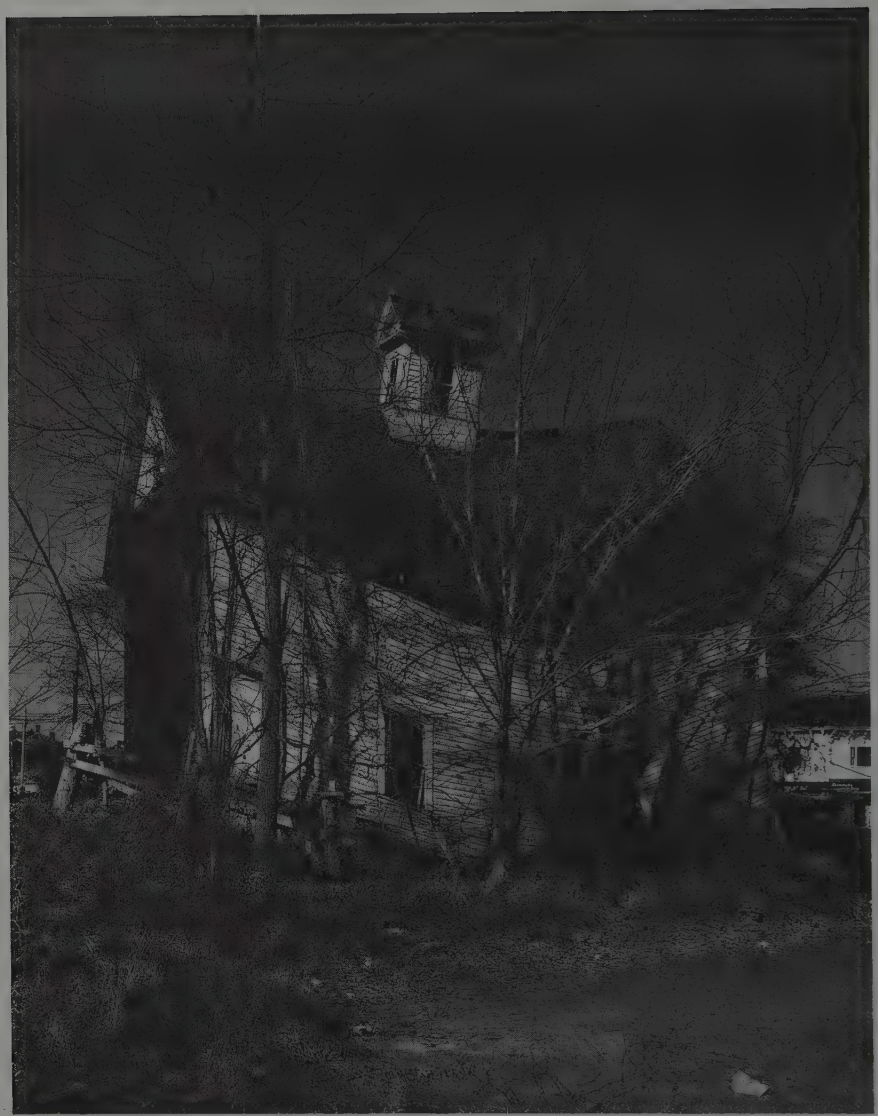
Even more revealing are the harbors, rivers, and lakes where urban waste has been dumped for generations, in attempts to put it out of sight. But the medical wastes—used needles, vials of blood, even body parts—that have washed up from the sea onto beaches (thus making them unusable and wasted) demonstrate the futility of trying to hide our wastes. *(43)*

Cities are filled with waste spaces—rooftops, vacant buildings, derelict land, railway sidings, or the space under and around freeways. While such spaces may appear to be useless or unused, upon closer inspection one usually finds they do have uses, albeit marginal ones—for storage, for dumping, even for shelter. *(44)*

Waste spaces are favored areas for play and exploration by children and teenagers. *(45)*

The creation of waste space often begins with gradual and unintentional decline. Dereliction attracts waste. Paint peels, weeds grow, broken windows are not repaired, trash piles up. *(46)*

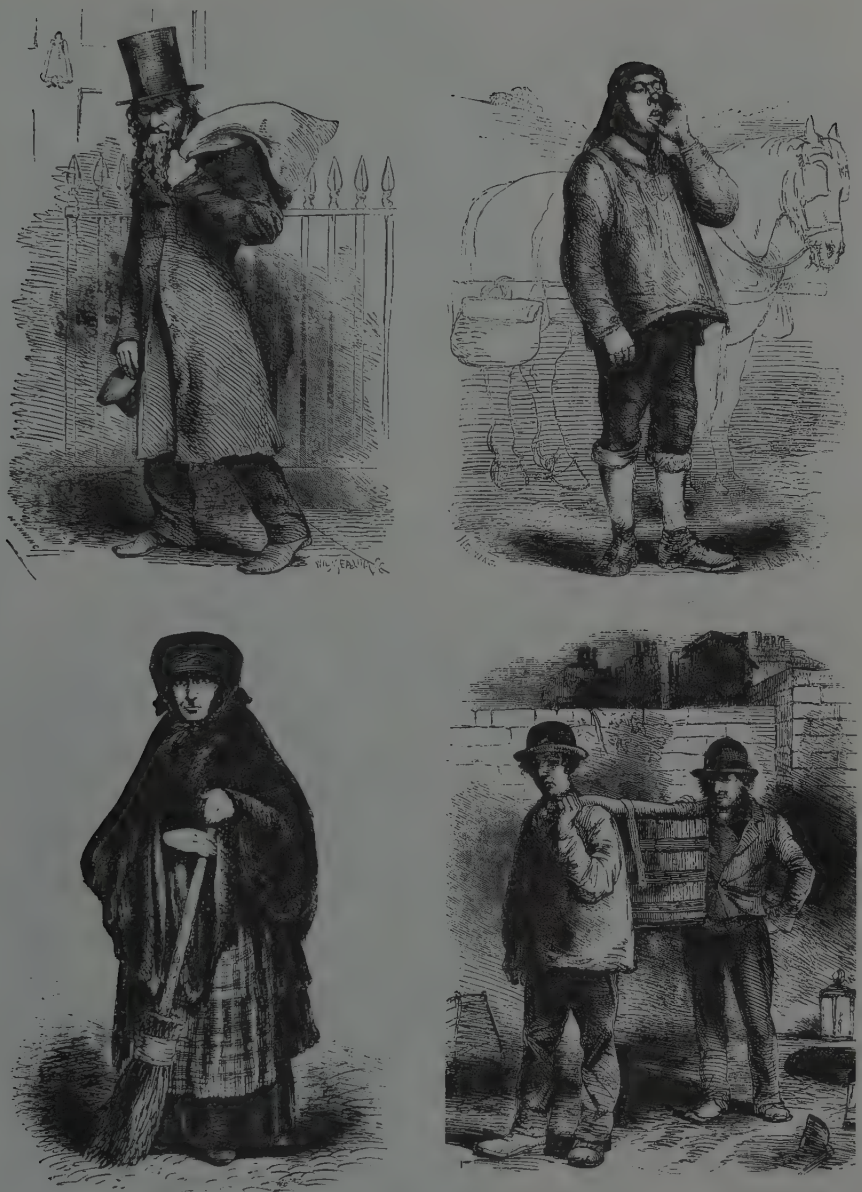
Economic shifts may lead to dereliction. With a change in the petroleum market, many gas stations became derelict, and some still await new uses. *(47)*



New England was laboriously cleared of rocks and forests to create farms, but as the economy shifted away from agriculture, the forests returned, leaving traces of fieldstone walls and decaying farm buildings. *(48)*

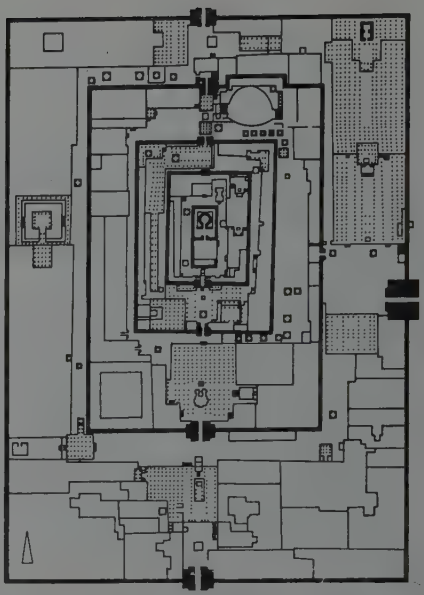
Over time, ruined and derelict places acquire emotional and symbolic meaning. They invite exploration and fantasy. The great, empty resort hotels of New England vividly communicate their vital past, although a changed life style caused by the automobile made most of them obsolete. *(49)*

"Hesper" and "Luther Little," the abandoned schooners in the harbor of Wiscasset, Maine, symbolize the end of the seafaring age. Useless for transport, they have now become picturesque waste, drawing photographers, artists and the casual tourist. *(50)*



Specialized trades develop around the handling of wastes. In nineteenth-century England there was an elaborate network of waste trades: the rag man, the bone grubber, the dust man, the crossing sweeper, the rubbish carter, the chimney sweep, and the nightman, among others. *(51)*

In most cultures, those who live by handling waste are stigmatized. The untouchable caste in India worked by night to avoid contact with higher castes while removing household wastes. The pattern of the settlement itself reflected these attitudes toward waste. The "purest" caste, the Brahmans, lived in the center, but the most "contaminated," the untouchables, were restricted to the outer edges. In some cases, as in the south Indian temple city of Shrīrangam, caste quarters were rigidly defined by a hierarchy of walls and gates. *(52)*



Wastes and wasting can be sacred and symbolic. The bones of 8,000 people executed by Pol Pot's men are displayed at the Chung Ek Memorial in Kandal province, 50 km from Phnom Penh. Adults come daily, weep, and light joss sticks while children play hide-and-seek around the memorial. A young girl playing there said, "My father was killed here too, but I don't know which is his skull."[1] *(53)*

Unwanted people, too, have been treated as waste. Lepers were banished to leper colonies or lazar houses. The insane were sent to waste places such as Welfare Island, where bleak asylums contained them. Now the hospitals themselves lie in desolate ruin. *(54)*

Waste can have spiritual power and is incorporated into sacred rituals. Among the Ne'wekwe fraternity of the Zuni, urine and excrement were consumed during ritual dancing for their magical healing powers and to show bravery. The one who swallowed the largest amount with greatest relish received the most praise. *(55)*

Dead-end wastes should be avoided through recycling. Little is wasted in India. What appears to be trash to the Western eye is in fact a random assortment of useful things. *(56)*

Junk is most useful when it is sorted. A heap of bicycles awaits new uses. *(57)*

A delightful gate can be made of old bicycle wheels. *(58)*

Mountains of used tires are now converted to electrical energy by the Oxford Energy Company near Modesto, California. *(59)*

Architectural salvage yards feed the demand for old building parts in building renovation, especially antique fixtures, ironwork, and hardware, or bricks, moldings, doors, and windows. *(60)*

Elements of the past can be saved and incorporated into new places to prevent the disorientation of total loss. A door and a bay window recall a former building that was cleared. *(61a, b)*

After the Fall of Rome the ancient temples and monuments were abandoned and fell prey to vandals and invaders. Squatters settled in them, and their marble was quarried by the church to make new monuments. The Theater of Marcellus, originally a Roman amphitheater, became a family fortress in the twelfth century and then the palace of the Savelli family in the fourteenth century. Today, its partially standing shell houses apartments. *(62)*

It is difficult to believe that the elegant Tuileries Gardens in Paris are in fact the recycled garbage dump of medieval Paris. *(63)*

The mills and canals of New England have outlived their usefulness for the textile and shoe-making industries, and, after a long period of dereliction, are being rediscovered for use as museums, housing, and high-tech industries. *(64)*

Will the abandoned shells of Buffalo's factories and grain elevators one day catch the tourist's imagination like the Roman ruins? *(65)*

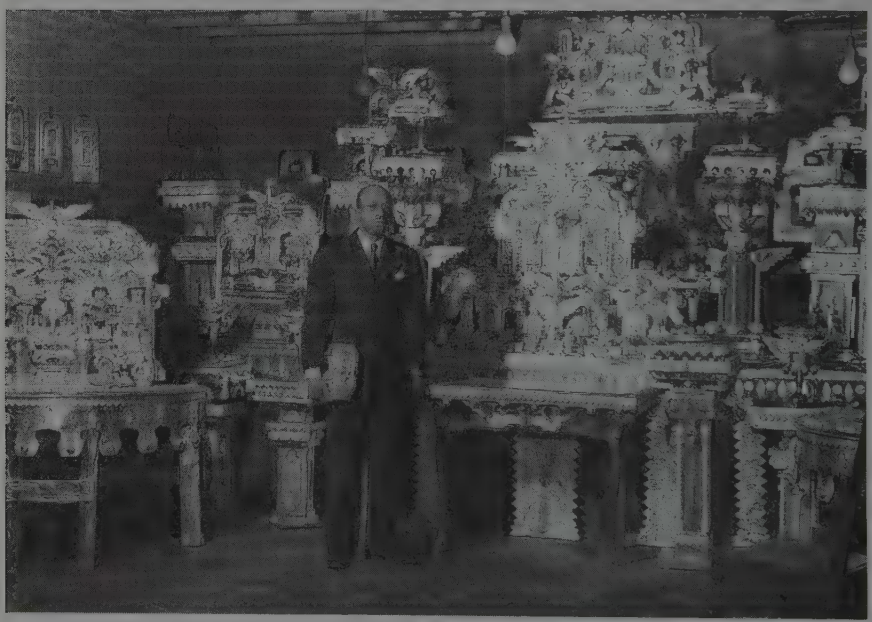
Not all structures are easily converted to new uses. The parking garage, with its heavy structure, low ceiling height, and peculiar floor plan, is not easily adapted, nor are the missile silos of outmoded weapons systems. *(66)*

Wasting can be a joyful experience as well as a public spectacle, sometimes attracting thousands. The Blenheim Hotel in Atlantic City, a certified state landmark, was reduced to rubble in 11 seconds by 400 pounds of strategically placed dynamite while hundreds of onlookers cheered. *(67)*

Junk is fascinating. Found objects can make the best toys, offering endless opportunities for imaginative play. *(68)*

Trash may provide occasions for social interchange and recreation. Town dumps often serve as social centers, as well as places to find recycled things. Garage sales and flea markets are a weekend hobby for many people. *(69)*

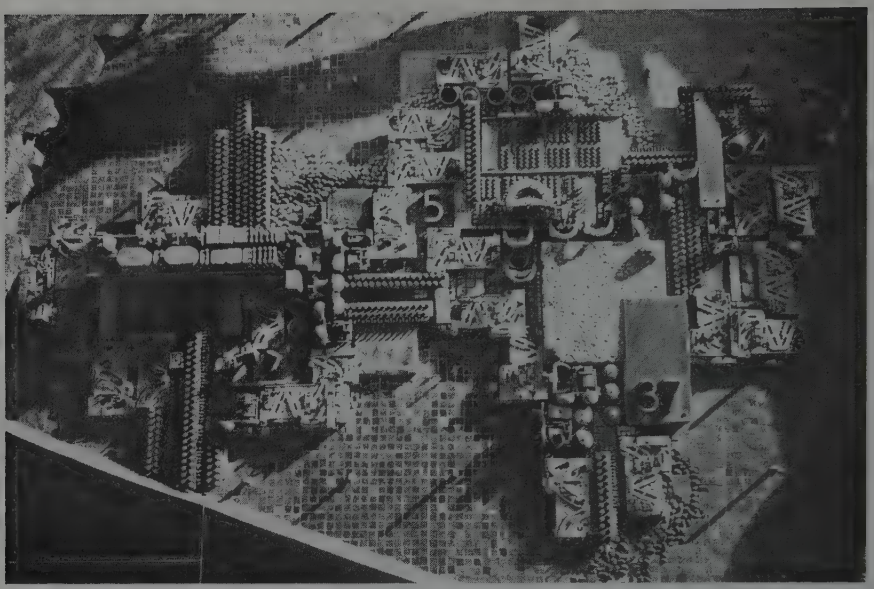
Waste is not usually considered attractive, yet many artists have been inspired to use it as their medium. Junk sculpture is now an established art form. *(70)*



James Hampton's tinfoil throne—The Throne of the Third Heaven of the Nations Millenium General Assembly—is made of discarded objects wrapped in gold and silver foil. Inspired by visions, Hampton worked for more than a decade 5 or 6 hours each night after returning from his daytime job as a janitor for the General Services Administration. *(71)*

To the annoyance of his neighbors and wife—but to the delight of children—Clarence Schmidt ornamented his house and yard over 40-odd years with 200,000 parts of cars, windmills, toy planes and submarines, as well as 400 mirrors, washing machines, row boats, fire hydrants, wagons, coffee pots, marbles, earrings, clocks, saws, hairpins, furnaces, electric fans, barrels, toys, animal skulls, false teeth, and much more.[2] *(72)*

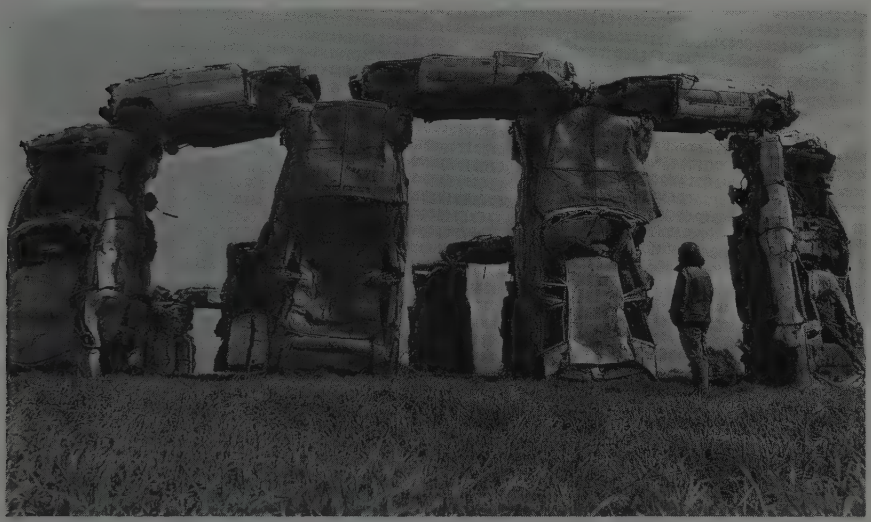
In Chicago, fantastic murals have been painted in waste spaces beneath the Illinois Central viaducts. *(73)*



A Los Angeles telephone company mural that at first appears to be a map, upon closer inspection is revealed to be hundreds of old telephone parts. *(74)*

To the delight of pedestrians in Amsterdam's Staatsliedenbuurt area, 6 vacant buildings were decorated with old shoes by artist Willem Nell. *(75)*

Donna Hensley makes jewelry, furniture, and wall assemblages from road kill. She carefully collects the remains of animals killed on Texas highways and takes them to a large cave filled with thousands of bats and flesh eating beetles. After a few days the carcasses are meticulously cleaned by the beetles, leaving only the bones. She loves animals and feels her work gives them a kind of enshrinement. *(76)*



"Autohenge" is a full-sized replica of Stonehenge built by sculptor Bill Lishman of 46 crushed automobiles. The sculpture is located in a field about 40 km east of Toronto. It has the same orientation to the sun as Stonehenge. *(77)*

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Although wastes often repel us, or may even cause disease and death, they can also give us pleasure, can enrich our sense of the past, and can support life itself.

CHAPTER FIVE

Then What Is Waste?

Definitions

WASTE COMES FROM the Latin *vastus,* meaning unoccupied or desolate, akin to the Latin *vanus* (empty or vain), and to the Sanskrit word for wanting or deficient. Thus it originally signified huge, empty, barren, useless, and hostile to man: " . . . a wide and melancholy waste of putrid marshes." (Shelley, *Alastor).*

Its definitions occupy many columns of fine text. There are barely a hundred words in the English language that have as many dictionary definitions. The meanings of waste range from wilderness and uselessness to disease and foolish spending. Every meaning is a negative one, with the possible exception of "remnants of crops used for wiping machinery." English, and other languages as well, are rich in its synonyms and cognates: corruption, putrescence, decay, ruin, pollution, defilement, contamination, taint, dirt, garbage, excrement, refuse, dregs, dross, scum, trash, junk, scrap; not to mention tarnish, sully, smirch, stain, blemish, dirty, blotch, and squander. Meanings overlap and shift with time, as words will do when they are important emotionally, but need not denote precisely. Over the years, the meanings tend to become more general and more negative. Junk once meant old but reusable iron, glass, and paper. It is now a general term for any useless, broken-up, nonfunctioning thing. The verb "to trash" once meant to free something of trash, as by lopping trees. Now it means to smash something up in riot, to produce trash.

Waste is what is worthless or unused for human purpose. It is a lessening of something without an apparently useful result; it is loss and abandonment, decline, separation, and death. It is the spent and valueless material left after some act of production or consumption, but can also refer to any used thing: garbage, trash, litter, junk, impurity and dirt. As we have seen, there are waste things, waste lands, waste time, and wasted lives.

Through this tangle runs a fundamental confusion: the reference to wasting and wastes as processes or their products, and the idea of waste as something fundamentally undesirable, bad by definition. I have tried to keep my footing by using "wasting" to refer to the process, and "wasteful" for the moral idea, and neither where I equivocate.

The dictionary definitions are centered on man. A "waste of ice" is something useless to us. More properly, the term is applied to a resource not in use, but potentially useful: waste time, a wasted life, an empty building or field, an idle machine. But the analysis of unused resources is uncertain. Could those unused things really be useful? A desert waste may offend us, but not be truly wasteful, since it could not be put to human use except at prohibitive cost. Even if it could be made to bloom, it may be that we have sufficient roses, enough fertile land. So the desert is potentially useful, at some uncertain future date, but not needed now. The desert becomes wasteful only if that potential usefulness is declining (erosion, or dune formation, or salt deposition may be impairing it), or if it requires energy, or human attention, or material resource, to maintain that potential usefulness (costly fences to stabilize the dunes, or check dams to prevent gullying). Thus a desert, or even an empty building or an unused machine, may only apparently be wasteful. Moreover, the unused desert may be supportive of human life in some indirect and unsuspected way. We may also ask: is the world made solely for our use and enjoyment? Does some Christian destiny drive us to exploit the entire universe?

Resources in use that are losing their usefulness unnecessarily are also thought to be wasted. The loss may be unnecessary, brought about by too rapid or inefficient an expenditure, or by a lack of normal maintenance. A leaking roof is wasteful (as well as uncomfortable); so is a clear-cut forest, a hard-driven machine, and a field exhausted by overcropping. But if the loss is due to normal wear under adequate maintenance, then that is not waste, but expected cost. Alas, *normal* and *adequate* are relative terms. Moreover, if the loss is due to some uncontrollable and unpredictable event, such as a tidal wave or a hurricane, the event is not a waste, since it could not have been prevented. Thus we multiply our opportunities for waste as we improve our control and prediction of events. Waste implies negligence or human failure.

The loss of usefulness may come in the form of obsolescence, a change not material but cognitive, produced by shifts in technology, demand, or supply. The test of wastefulness is whether the shift was beneficial, costing less than what it gained. When people abandon small houses to live in larger ones, it need not be wasteful, unless the original house, or its elements, could reasonably have been reused or enlarged to that same size at less cost than was required to build the new one. We are easily confused by these calculations.

Marxist Analysis

Marxists say that capitalism requires a steady acceleration of wasting and abandonment, in order to maintain a scarcity of goods. Scarcity, coupled with an artificial inflation of consumer desire, increases the throughput of material, and so maintains the rate of profit in the face of its progressive tendency to fall. Fashions, advertising, and technological innovations swell intake and evacuation, in a crescendo of consumption. The engorged system is periodically cleared of its fatty surplus by a diet of depression, much like the periodic downswing of anorexia. Getting and losing follow in jerky succession, an alternation so nicely parodied in the "City of Efficient Consumption" paradigm of *Communitas.*[1] People "consume" leisure, space, and time, as if our lives were simply an eating up and a throwing away. Like the earthworm, we are a tube for ingestion and excretion. Whether the profit rate must always fall is debatable, but it is clear that capitalism, once it is connected to the mass market, is motivated to increase consumption. Whether that is good or evil depends on the satisfactions gained from consumption, and on the long-range effects of a heightened rate of wasting.

Wastefulness can be a burden to one and an advantage to another. The wasteful abandonment of household goods, which may in time impoverish a family, is the ragpicker's livelihood. It was once said that the nobility had a duty to live riotously, so that the lower classes might survive by providing for their wasteful demands. An empty building can be profitable to its owner, even while families are homeless. A profligate use of timber, which denudes the land of forests for future generations, can be the cheapest way of building good houses. The labelling of something as waste must always ask: waste for whom?

Prodigality

There is a concept of "prodigality" in French law, under which a person may be restrained by the state from

managing his own property, if he both spends beyond his income and does it in some absurd way, such as throwing money to crowds, or feeding stray cats on caviar. Dispersing capital heedlessly, even if there are no direct heirs whose loss it becomes, is inherently immoral. It kills the golden egg–laying goose, and it undermines the stability of a social order that depends on propertied people. This wastefulness may be contagious, and the state must intervene, even if the irrational spending simply transfers wealth, and does not destroy it.

But when is spending absurd? When it cannot lead to satisfaction? Then we must analyze satisfaction, and predict its achievement. It might be intensely satisfying to throw money to a crowd, or even to burn one's house. Entrepreneurs will often expend capital for the sake of future income. And is income the only true justification for spending? (National debates argue the merits of "productive" investments in factories versus "unproductive" investments in houses.) We are back where we were: who gains? who loses? The Kwakiutl institutionalized the public transfer and destruction of property. The demonstrations were the highlight of the confined rainy season, a substitute for war and raiding. They gave dramatic meaning to Kwakiutl lives.

Abandonment

Abandonment makes waste. We give up our interest in something, permanently and for no consideration, since the object has exhausted its value for us. We do this every day, but abandonment usually refers to a more remarkable and intermittent process. It means giving up the family farm, discarding the old car on the margin of a field, or leaving a country behind. It is a loss, but it need not be a wasteful one. Abandonment may be forced or voluntary; it can be protracted, or sudden and catastrophic. Usually, it is a gradual process, a slow relinquishment of concern and rights. But the law wants clarity: either you own something, or you don't. In the real sequence—that succession of acquiring something, using it, putting it aside, coming to see it as useless, seeing it carried off, and allowing it to be destroyed or appropriated by another—the law must find the moment when ownership stops. Locating that moment can be troublesome, were I to have a change of heart, or find that others are reading my discarded mail.

Decline

Abandonment differs from decline, which is a gradual diminution of value or vitality. Decline may lead to aban-

donment, but need not, nor must abandonment be preceeded by decline. Abandonment can be painful when it is involuntary. In other cases, it may be a liberation. Repeatedly, North Americans have abandoned their habitats: their mines, forests, exhausted farmlands, small towns, and more lately the central city. Since many once-abandoned country towns and rural lands are currently being reoccupied, can we look forward to a reoccupation of Roxbury and the South Bronx, and a future for Detroit? Are these urban deserts truly wasteful, or only one stage of some normal process of adaptation, however marred by human grief?

Time

Wasting things, or space, or energy is a relative affair, depending on the alternative uses for these resources, and our valuation of them. Wasting time, however, is more desperate, in a society that computes interest and believes that time is money. Space, timber, or coal can lie unused and not be wasted, but time that is not constantly employed wastes automatically. Or so we feel. The hectic generations of fruit flies must waste less than the deliberate sloth (or perhaps they waste less of *our* time than the sloth), and so we use them for our genetic studies.

Wastelands are "timeless" places—not that they are eternal, but that there is no time organization there; time does not seem to pass of itself. Then wasting can be an escape from rational time. Time is not an absolute good; only a human effort that has no valued outcome can be a waste of time. A wasted life (which is quite different from a spent life) is the most grievous instance of wasted time. The waste of a person—when someone does not develop into what he or she might have become—is a fundamental loss, from which all other wastes derive their meaning for us.

Spents

Waste also applies to the apparently useless by-products of production and consumption: the familiar shavings, packagings, mine tailings, sewage, ashes, or garbage—substances akin to the wastes that appear in the natural cycles, albeit more numerous and novel. We might call them "spents," to distinguish them from other wastes that are not simply by-products, which tend to have a higher (or darker) moral color. In the human view, spents can be evaluated in terms of the degree to which they are offensive or dangerous, the relative cost of their disposal, and any neglect of residual usefulness. Even so, spents become less desirable as they accumulate, or are concen-

78 Many spents are useful. Manure is collected for fuel and fertilizer. A young girl on the outskirts of Cairo shovels dung from a donkey cart for use as fertilizer. She is one of the children of the "Zebeleen" who work as rubbish collectors. *(Reuters/Bettmann Newsphotos)*

trated in the wrong place. Clean sweet-smelling sawdust, if piled high, is inflammable and acidic.

But many spents have regular human uses: paper, secondhand books, scrap metal, machine parts, used clothes and furniture, old timbers, doors and windows, brick and stone, broken glass, compost, wax, and fats. For each of these substances, a regular recycling system has developed. In our turn, we use the wastes of other species: manure, guano, alcohol, cheese, pearls, amber, petroleum, limestone, coal, peat, organic soil, plant oxygen. (It is interesting that, however significant, this list is much shorter than that of the goods we acquire by direct predation.) Some human artifacts, such as old buildings, are normally remodelled and reused. Others, such as vehicles or machines, are rarely rebuilt. Some artifacts survive for long periods: masonry structures in particular, and that ceramic rubbish beloved of the archaeologist. To this we may now proudly add our radioac-

tive waste. Whether wastes persist in some irreversible form, or can be smoothly absorbed and transformed, has much to do with their impact.

Patterns

Patterns also survive: old rights-of-way, lot lines, town sites, and sanctuaries. Obsolete building forms become sacred forms, and old settlements sacred places, just as old languages survive in sacred formulas. Old means of livelihood become pastimes (ways to pass or waste time): gardening, fishing, hunting, camping, boating, cooking, potting, weaving, bookbinding, cabinetmaking, riding, railroading, skiing, fencing. But not all work is translated to the nirvana of play: think of ditching, laundering, sweeping, or carrying loads. Is this the final test for satisfying work? Will coal mining, assembly line tending, clerical work, or operating an elevator ever become amusements? Perhaps truck driving may.

Wastelands

Waste things are shifted to the social margins: low-income areas, decayed countrysides, "undeveloped" nations, basements, attics, backyards, road edges, vacant lots, marshes, and the outer rims of cities. Today, the great cities have absorbed those waste regions and the rural poor that once surrounded them, transforming them into underused central city lands and marginal urban classes.

79 Outmoded means of livelihood often become fashionable forms of recreation. Coaching is now an important social event in Newport, Rhode Island. *(© Michael Southworth)*

Wastelands are the havens of rebellious, marginal, illegal people. Swamps were the hideouts of the southern slaves and the refuge of the Cajuns. Mountains harbored the Cuban guerrillas, and the displaced intellectuals of China. The cold, wet, northern margins of European Russia were peopled by Old Believers, in flight from the Tatars and religious heresy. Wastelands are places of despair, but they also shield relicts, and the first weak forms of some new thing, a new religion, a new politics. They are places for dreams, for antisocial acts, for exploration and growth.

Waste places play similar roles within our cities. Children play in vacant lots, briefly emancipated from adult control. Alleys, which were intended for service access and for waste disposal, were also used by children, ragpickers, and criminals. Now redundant, they become fashionable mews, or make possible a bikeway system. Columbia Point, in Boston, was once a swampy peninsula, used as a calf pasture. Later, it housed a sewage plant, and the principal city dump, and then a public housing project, and then a college that no one wanted next door. Now a political memorial, the John F. Kennedy Library, has been erected on it (a use rejected elsewhere), and the peninsula has become a point of new growth. *See figures 7, 45*

In another Boston example, the new turnpike and the skyscrapers of the insurance giants found their niche in the crack between the Back Bay and the South End—a neglected wedge of ground, originally a swamp, which had been mindlessly cut up by rail lines, and which lay at the joint between two different land development agencies. Near Boston, the Alewife area of Cambridge today makes room for a transit line extension, new industry, and a wetland sanctuary. This lost district, now useful, was likewise a frontier of swamps and rail crossings, at a meeting of old town boundaries. Its marginal topographic character was a residue of the displacement of the Merrimac River by the glacier. Again and again, we find that such wasteful cracks, joints, gores, and margins are favorable places for change.

All these events focus on ourselves. But if we no longer put our species at the center of the universe, then these meanings may have to be extended. Wasting is an essential process in the whole living system, undesirable only when it is blocked, or when it generates material at a rate or of a type that cannot be taken up.

We look for order, stability, and clear boundaries. Waste seems chaotic. Discarded materials are usually mixed substances. Yet some wastes, although thought impure, may in fact be highly concentrated deposits having substantial value. Feces are concentrations of processed organic material, quite valuable to farmers and bacteria. Abandoned buildings are mines of salable copper for vandals. The rational and emotional definitions of impurity do not coincide.

Loss Versus Waste

The death of a loved person at an advanced age is a loss but not a waste, and so is the disappearance of a familiar landscape that has been converted to some useful purpose. But when a promising young person is killed, or a childhood home demolished to make a vacant lot, then our negative feelings are reinforced by the added sense of waste. Moreover, when a thing has died, or been abandoned, it may leave behind its avenging ghost. We are animals whose continuity lies in our genes, carried by lines of perishing individuals, but we have acquired individual consciousness. We fear our own extinction. In our minds waste, decline, and death are linked. No wonder dirt arouses such feelings. It is uncontrolled, malicious, a reminder of our ends. All the words for waste are evil magic; they force attention.

And yet these things have hidden attractions. We are fascinated by destruction and disorder. Disorder spoils our patterns but supplies material for new patterns, and we are pattern makers. Waste is full of novel forms, and carries subtle signs of its origin and former use. Its ambiguities are poetic. Waste heaps are information sources, into which we poke with prurient fingers. We can find morbid satisfactions in decay. There we can be nostalgic for the past, and yet rejoice in our survival.

Pleasures of Wasting

We like to smash things, to use our power and see its effect, to defy society and proper behavior. There is at least a temporary pleasure in gross consumption, in soiling, in displaying our wealth. There are other pleasures in removing waste, in purifying ourselves, eliminating. When we reuse some abandoned object, we are quite pleased with ourselves. It seems to have come to us without cost. We are freed from control in waste places. We let down our guard, give up, relax in shabby comfort, do as we please without regard for appearances. King plays at commoner and enjoys it since he can return to kingship. Using up and moving on, we leave our old shells behind and are renewed.

So wastes attract us, and repel us. We both loathe and rejoice in them. What waste may be, shifts from one culture to another, and feelings reverse from person to person. These strong and contradictory sensations drive us to act, now with good effect, and now with dire result. We can agree only that waste is on our minds.

Wasting Versus Wastefulness

Rummaging through these concepts, looking for guides to action, I must first distinguish wastefulness from wasting. In regard to the former, I find two basic concepts, overlaid by extensive emotion. One view of wastefulness is developmental, the other economic. The first view is stable and general, the second relates to context and purpose. The overlying feelings are culture-bound, and therefore varied. Nevertheless, since these last are also tuned to our common human nature, they are related to each other. Eventually, these overlying feelings must be aligned with the underlying normative views if we mean to act effectively. Realignment will require a mutual adjustment between act and image. Let me explain.

Developmental Waste

Energy and material substance flow through the world. Matter is constantly recycled through the living system, except for that fraction that escapes to some nonliving sink, as when marine shells are deposited on the sea bottom. Step by step, energy degrades to random heat, is lost to the air, and eventually is radiated into space. Life feeds on these passages. Each user releases his wastes to the next user in the chain. To our horror, this waste is enormous: the individuals eaten, the dead and dying, the expense of seed and young. But the system maintains itself, perpetually turning waste into new organic tissue.

Dying has a biological function. The chain of expiring individuals, each one transmitting the slowly changing genes, adapts in improved ways to a changing habitat, and so can elaborate and perpetuate its own genetic pattern. The chain is not a circle, turning forever in a single, recurrent track. Life develops, and we value that progressive growth, the countercurrent to the energetic running-down of the universe. If my ultimate value is life and development (a value that is the very basis of my argument, and which I will not further argue), and if wasting is an essential component of the living, developing system, then wasting may be judged by the degree to which it supports that growth of organized complexity.

A "wasteful" event is one that produces a discontinuity in biological or cultural development. One break occurs

80 Preservation taken too far is fraudulent, recreating a past that never was. The pristine charm of Colonial Williamsburg creates a false impression of life in 17th-century America. *(© Michael Southworth)*

when a living species is extinguished without a genetic successor. Biological information, so slowly and painfully acquired, is irretrievably lost. True, our judgment here is not impartial. To us, the extinction of the human race would be the supreme waste, but the loss of some other species might be bearable, even admirable. We have just congratulated ourselves on the eradication of smallpox. Nevertheless, we are concerned for those species on which we are dependent, and for others that are not inimical to us. Moreover, since the living system is highly interconnected, we cannot be sure of the consequences to ourselves of suppressing any of its components. A stable living universe enhances our chances for survival, at least as long as we are safely dominant.

The extinction of a human culture or system of knowledge is a waste similar to the loss of a species. Therefore, no organized pattern of ideas, skills, and feelings should be snapped off, without record, or without some opportunity to develop into a new configuration. This is not a plea for preservation. Preserved places and customs can become fraudulent images, and so degrade our store of information. Better to reapply the underlying values and

skills of an old pattern in some new way, preserving symbolic traces of what is passing, and perhaps a few relics, which can be renewed if ever needed. They mark the passage of the old world with a memorable ceremony.

Wasting may stimulate new knowledge, or enrich the arts. Exemplars can be rescued from trash, garbage studied to analyze ways of life, dumps classified and located to aid future archaeologists. We might maintain archives about former streets, or photographs of our discards. It is continuity and development that are paramount: the selective conservation of essential knowledge and values, judicious discard, and the encouragement of further growth.

Information Waste

As information elaborates, it must itself be wasted: weeded, compressed, restructured, made more organized and veridical. Retrieving information has its cost, as does retrieving material by unmixing. Jorge Luis Borges imagined an infinite library, containing all knowledge, which, being infinite, was inaccessible and therefore useless.[2] The wasting of information is a subtle task, involving symbolic compression and restructuring (that is, new theories and new insights, not just a new filing system), but also the preservation of random traces, which may have an unpredictable future importance.

All biological patterns eventually disappear or are transformed; no culture lasts forever. Since I admire development, to me it is also wasteful when any culture, person, or system of knowledge, or perhaps any species, reaches a dead end. Species development is a process over which we have little control, at least for the moment, even if we have been able to maneuver some domesticated animals into fairly narrow evolutionary boxes. Cultural development is admirable, but it can be difficult to distinguish dead ends from main lines, or flowerings from destructive instabilities. Promoting development, rather than simply preventing extinction, can be a puzzling policy.

We can apply this aim of development to the pursuit of systematic knowledge, and to the course of individual lives as well. We take pleasure in new insights, and mourn when a person of promise fails to develop some of that potential. Wasted lives are waste indeed. Boredom and repression are clear signs of blocked potential. Well-wasted time, on the other hand, may be an antidote to wastefulness.

The constant circulation of matter and energy underlies this slow growth of information. Disturbance of that circulation threatens growth. Waste occurs when material is lost to some sink and cannot easily be recovered: topsoil to an ocean bottom, or carbon to the rocky mantle. In particular, a loss of food and other organic material is a crucial loss. Conversely, the recovery of sunk material and its reintroduction into the circling system is a victory over waste.

Waste of Energy

Waste also occurs when energy is degraded to random heat more rapidly than is necessary for the maintenance of life. Energetic waste is minimized in certain climax stages, in which nutrients cycle with little loss; and energy is parsimoniously handed down the chain, supporting a large mass and diversity of living creatures, before it scatters beyond recall. Relative to these climax stages, man-made settings leak nutrients and energy at every joint. Dreadful as this may sound, it is not clear that we should strive for a world where transient energy goes as slowly as possible to its ultimate fate. Life in a rain forest or a salt marsh is not ideal; we prefer landscapes of an intermediate efficiency. Achieving a slow degradation of energy is not crucial for us, unless the heat flow cannot easily be dissipated, or unless our energy sources are limited, an issue pressing momentarily, but apparently not a long-term danger.

Of the two losses, matter and energy, it is the irreversible leakage of organic material that is the more serious; the earth's surface has a limited supply of substances essential to organic synthesis. However, the influx of energy, although surely not permanent, will persist for an extended time. So we try to prevent soil erosion, the waste of food or water, and the loss of phosphorus in sewage. Where we can, we should recover organic material previously lost, and support the constant return of key elements to the organic chain. We already have the power to fabricate environments that conserve nutrients, and might invent others even more conservative than the natural climax states. The recent experiments of the New Alchemy Institute with closed food cycles are an example.[3] If one must dump, and not recycle, then think of it as temporary storage. If not degradable, the wastes should be left in pure and accessible deposits, and not in hidden, chaotic mixtures. A standing building is easier to mine than is its debris in a landfill. Resource recovery is

an unmixing. Pure deposits, if not poisonous, are better suited for unknown future uses. A waste of accessible space may be room for future growth. In that way, we allow for future branchings.

It is wasteful, then, whenever energy and matter are being transformed without being used for the maintenance and development of life, especially when key organic material is being lost. If life feeds on wasting, and life is what we value, then wasting is wasteful when it fails to support life. Be careful: this is a sweeping rule. If life is a rare and earthbound gift, then the rule condemns all the transformations that take place at any remove from the skin of our planet. Rather than indulge in such a universal accusation, let us confine ourselves to home.

Health

Something else is implicit in this notion of development: the proviso that no energy or material be disposed of in a way that is permanently toxic to life. The influence of wastes on health is complex, and can be counterintuitive. As new products multiply, our senses, trained in ancient circumstances, become progressively unsuited to distinguish real from illusory danger. Most bad smells are innocuous; many undetectable air pollutants are toxic. Litter and trash are small danger. A ragged paper house can be healthier for its occupants than one of solid stone. If only all dangers carried warning signs and all benign wastes looked acceptable. Health is a compelling rule, but hard to live by. There are always further dangers to be discovered.

Novel wastes, and speeded rates of generation, cause disruptions in the cycling process. Users cannot take up the refuse at the rate at which it is produced. Organisms have no time in which to adapt themselves to exploit the new resources. (Might such adaptations be accelerated?) Good wasting is neither so fast nor so slow, so concentrated nor so dilute, that it cannot easily be absorbed by the environment into which it is discharged. We should be wary of disposals that will lead, by steps however small, to the dead-end position that piped sewage has put us in. Beyond that, there is no inherent value in minimizing the waste flow, nor in recycling for immediate human use as much as possible, since it may be less costly to exploit virgin resources. We need not prohibit *all* dangerous discharges in order to avoid being put in a dead-end position; life is a risky business. But we must be concerned with

situations where toxic wastes are accumulating, and in particular are accumulating irreversibly. Sludge on the river bottom troubles us more than sewage aerating as it flows downstream. Radioactive waste is terrifying. No change is completely reversible; all events leave their traces. But we are grateful for adaptability, for near-reversibility, for the chance to try again without penalty. We cannot lie still in the water, nor even sail home. Instead we hope for a good voyage: no bad surprises, a continuous heading, and interesting destinations, from which we can leave for other ports.

Reversibility and Open-Endedness

Thus, wasting is useful where it supports life and its development, and wasteful where wasting is blocked, accumulates in toxic form, or causes a loss of organic material. Maintain reversibility in the short run and open-endedness in the long; don't put out more than the context can absorb. The greatest wastes occur when species and cultures are extinguished. Decline and death, on the other hand, are normal and life-enhancing. So we might well rejoice to see dead bodies and rotting matter. We should value a connected flow: of matter, of energy, of those patterns of information that tend to become more highly organized in the face of the increasing physical disorganization of the universe.

This rule of continuity is connected, stable, future-oriented, and conservative. It is the rule most useful when we are (as almost always) ignorant of future consequences. Within this constraint, we would like to encourage biological, cultural, and individual development—as far as we can detect them. Here we come to cloudy judgments, more uncertain in their application. Squandering the energy reserved by the eons in oil and coal powered the leap to industrial society. This has been one of the great cultural developments in human history, one destined to have an extended future influence, should we survive it. The ecological inefficiency may well be justified by the developmental gain—as long, that is, as we have not risked the continued existence of the living system.

Economic Waste

Other events that we may call wasteful are quite different in nature, and their evils relative. They are what we most often refer to when we decry this wasteful world. This second concept of waste is simply inefficiency: time, effort, or resources expended without useful result, or without extracting the maximum human value possible. We may speak of a waste of money, lumber, or power;

or of a wasteful way of making thimbles. What we mean is that the process could have been carried out at lesser cost or with a greater benefit to someone. Wastefulness of this kind can occur while the ecological process is working smoothly, and when a culture and a person are in full flower.

To detect inefficiency requires a calculation of utility that must construct a limited set of current or foreseeable alternatives for comparison, identify the costs and benefits accruing to the different actors in each alternative, put them into commensurate units, be mindful of future costs and benefits to actors not yet present, and then tot up the whole. Each of these operations raises difficulties if it is strictly carried out. By necessity, the values weighed are human values, and usually those of a small group of people, confined in time and space. Since the values of different actors are often in conflict, we must either emphasize values generally held and comprehensive in their application (as we have attempted to do above), or generate a limited array of cost-benefit comparisons, among which a choice can be made by some political process. To be useful in that, the calculations must be narrow ones, narrow in the sense of the interests consulted, and also in the scope of the costs and benefits to be considered. Judgments will vary as we go from time to time and group to group. "Waste for whom?" is the critical question. The method is general, but its answers are unstable. Moreover, in most economic computations, the direct cost of wasting itself is a minor element in the cost of production. Thus the degree of wastefulness, or efficiency, is only weakly connected to wasting.

We are mesmerized by the bottom line. What matters is the final profit extracted. All that goes before is waste, things to be gotten through, factors to be used up, sheer costs. It is as if there were only one moment in which we balance good and evil, and the continuous stream of living were only a long journey to that supreme moment.

Even at that moment, however, an action can be labelled efficient only if its costs and benefits are conventionally defined. What might be called "technical waste" can be computed when we are given one particular process, with defined, restricted costs, some definite desired output, and agreement on how to measure gain and loss. Then waste is any valued input or unwanted output greater than would be generated by some other process.

Even when technical waste has been eliminated, a large volume of spents can be present, as well as idle capital, ugliness, and wasted lives. Technical waste has no necessary connection with visible waste, or any inverse connection with a visible economy of means. The "economy" of Maillart's elegant bridges was a saving of concrete, not of forming labor. Wherever human care is efficiently reduced because of high labor costs, there we find less technical waste, coupled with less pleasure for the eye.

Surrounding the direct productive act is a halo of waste time: time spent in recreation, in housework and other unpaid labor, in travelling, rest, unemployment, idleness, and whimsy. Costs of this halo are invisible. A surge of overtime and underused labor can be summoned up in times of stress, and will vanish when no longer needed. Deserts, water bodies, swamps, forest, mineral beds, casual laborers, second earners, and abandoned places can be held in reserve without account, because they are considered valueless, because an investment has never been made in them, or because that investment has been amortized, or accounted lost. The rules by which times, things, and persons are placed within or without a productive realm are crucial assumptions. Accounting standards for writing off a loss are one example of them. There are conventional lines between paid and unpaid labor, and accepted occasions in which unemployment, waste disposal, or environmental damage may be charged to someone else.

As a result of these soft edges, although efficiency and profit are calculable, we often restrict the epithet *wasteful* to a smaller class of inefficiencies: those where the alternatives are well known, the actors at hand, the costs far greater than the benefits, and the discarded material, time, or energy visibly substantial. Building apartments of concrete panels may be more efficient than making them of brick, in some particular time and place. But since the calculation is close, and varies with circumstance, we hesitate to call a brick building wasteful. We reserve the word for a careless, costly construction that cannot be used because of faulty foundations, or because no one wanted an apartment in the first place. Waste is thus a gross, visible, and clearly avoidable loss, a heightened form of inefficiency. Examples are not so rare. Military operations, or the blunders of remote centralized powers, provide us with many excellent cases.

Bulky spents can accompany operations that are efficient as judged by some accurate, restricted calculation. Efficient coal mines produce enormous waste heaps, and their streams run acid dark. Efficient wasting may be unhealthy, discontinuous, or unpleasant. Enterprises that have migrated from one location to another, leaving behind empty buildings and impoverished cities, can be shown to be producing more efficiently in their new locations. It is sometimes hard to know which is wasteful and which is efficient. Not only may an efficient operation be extremely wasteful in the primary sense, but vice versa. Surely anyone could invent a less prodigal method of continuing a species than by this vast waste of seed and spawn? Or, on a smaller scale, the hand weaving that preserves an old tradition is clearly a more inefficient way of making cloth.

To recite these difficulties is not to dismiss the economic criterion. Limitations of this kind arise in any attempt to make a rational, comprehensive, and quantified decision. The first criterion of waste has its own problems, especially when we introduce the principle of encouraging development. Its criteria are qualitative: guidelines, not computations. They escape the problems of close calculation and lose its sharp edge. On many occasions, the primary rule will not furnish sufficient ground for a decision. Detecting and avoiding the wastefulness of inefficiency remains important, wherever we are sure of our actors, and of our costs and benefits and their total, and can show a marked loss. In doing so, however, we should consider longer durations: long cycles of use, maintenance and repair. The efficiencies of upkeep, repair, and rehabilitation are too often disregarded.

The economic view of waste does not have the stability of the developmental view, based as is the latter on values that are permanent and universal. Efficiency is a balancing rule, one that depends on other primary values to identify its costs and benefits. Although general, it is always relative, and necessarily subordinate to other judgments. All too often, those prior judgments are only implicit in the efficiency calculation, and so are distorted or mislaid. The economic rule retains its role in guiding production and can define wastefulness in particular circumstances, but it should be applied *after* the primary rule. It should use longer time spans and more extended groups, and should focus on gross inefficiencies. To keep

decision makers within the charmed circle of proper wasting, it may be necessary to impose artificial prices on them: rules, fees, penalties, subsidies, honors, tax advantages, and the like. So we distinguish wasting and wastefulness (which may be developmental, ecological, or economic), spents, obsolescence, abandonment, and decline; waste places, time, energy, material, information, and wasted lives; technical waste and its perception.

Waste Perceived

The two rational judgments about wasting are complicated by our perceptions and feelings. Perceived waste may not be waste at all, in either of the two preceding senses. It may be apprehended in a smooth ecological process, or in some promising development, or during an efficient act of production. These human reactions are rooted in our nature as social animals; they cannot be ignored. Rational calculations must come to mesh with cognitive preferences. This may mean changing our minds, in order to see waste in a new light. If we do, we will dredge up a dangerous and fertile sediment of generations of human thought. But it also calls for changing our wasting processes, to make them consonant with our modes of thinking. Since our feelings are founded in our biological and cultural history, they are quite "natural." They focus on ourselves. But as we begin to see ourselves as the first conscious, reflective creatures cast up by the developing living system, it may be that we will come to some "unnatural" perceptions, based on an empathy with the larger processes of life.

Our natural perceptions vary between different cultures and yet have characteristic similarities. They connect waste, death, and decline. Wastes are chaotic and impure; they threaten order and stability. They are uncomfortable and annoying. The horror over Love Canal, Three Mile Island, and Chernobyl, rational as it may be, is strengthened by subconscious aversion. The irrational feelings will power the political drive needed to bring about rational measures. Wastes frighten us.

There is also a general fascination with wasting. It can mean freedom, an opportunity for acting spontaneously, the chance for a new order. There is a pleasure in ruins, as Rose Macaulay said,[4] and an excitement in exploring the local dump, so full of hidden knowledge.[5] We enjoy profligacy and destruction, delight in clearing ground. In our unconscious, we find darker pleasures, death wishes.

These feelings run deep, but their bed does shift. We

have seen the long, slow drift of popular feeling toward an affection for old things; and the more rapid, and perhaps more superficial, growth of interest in junk and random patterns inspired by contemporary art. Art can lead us to see value in used things, and stable patterns in dynamic change. The sophisticated simplicities of esthetics and religion are lessons in constructive loss. Cleaning can be a joyful common ritual that reinforces the social bond. The art of dying is a profound teaching in how to control an ending, and how to make it meaningful. The aristocratic art of wasting time can enlarge our lives.

We have found three classes of waste: developmental, economic, and perceived. The first is true waste, by our account. The second, largely unrelated to the first, is a useful calculation: less stable, less general, and context-bound, used in particular cases and within the limits set by the first rule. The last class is loaded with emotion, and specific to culture. Our task is to bring these concepts into correspondence with each other: to make wasting a joy, and an occasion for growth.

Criteria for Wasting

Where the criteria for good wasting are based on stable and general grounds, then our attitudes should be brought into agreement with those certainties. Correspondence includes rational understanding, but also a restructuring of our emotions, which is the more difficult feat. Where the criteria are less stable or general, we may employ the opposite strategy, bringing our wasting into accord with our feelings, especially when those feelings are an integral part of our culture. This may require the masking of waste, its reshaping or ritualization, or an acceptance of certain inefficiencies. Some of our waste emotions may lie deep within our brain structure, and be ineradicable. Wasting must then be distorted to conform.

Wherever possible, we look for ways of making wasting a positive experience. We can begin with those pleasures that wasting already affords: the strong sensations of destruction, of soiling and cleaning, of shabbiness and backsides, of moving on and using up, of reusing old material and seeing new patterns in it, of appreciating historic depth, age, maturity, and decay. Wasting things could be as valued and interesting as making and consuming them. Collecting garbage and trash might be a learning process instead of a demeaning one, an opportunity to exhibit skill or to gain knowledge. Could scrap,

iron, garbage, and rags have the same engaging emotional connotations as timber, stone, and corn?

The rules apply to all wastings, from the daily discharge of wastewater to the abandonment of a city. Some judgments that rise from them will be conventional, and some surprising. In the past, wastes were something to be made inoffensive and invisible, and to be carried far away. More recently, minimizing waste has been put forward as a better rule: reduce consumption, make things permanent, maintain them carefully. Alas, wasting cannot be suppressed. To see life whole, we must attend to loss. We have not based our argument on permanence, purity, waste reduction, or even on a stable ecology. Why *not* live in paper houses? Why not take pleasure in breaking things when they must be broken, make cleaning a joy, find compensations in decline, deal openly with loss and abandonment, see death as a part of life? The abandonment of place might be a moving, dramatic spectacle. Wasting, seen whole, is a tragic and marvelous process.

CHAPTER SIX

Wasting Well

THESE THEN ARE SOME very general rules for wasting well: avoid any abrupt loss of biological or cultural information; support an ample and diverse living community; maintain a smooth waste flow; encourage development; avoid gross inefficiencies. Take joy in wasting; do it skillfully; don't simply minimize it. Many applications of these rules come to mind. Others will come to other minds, and some of those on my mind may verge on the ridiculous. Even so, they illustrate a field of action: the revision of waste processes and waste perceptions in an effort to deal with the stream as a continuous whole.

Wasting proceeds over a broad spectrum of scale, from daily use and disposal, through periodic acts of reuse and abandonment, to those sweeping and protracted events such as the demise of a biological community, resource exhaustion, or the decline of an entire region. To be sure, there are scales beyond this—think of the wasting and generation of the stars—but they lie outside our human limits. As we give some examples of action, we will proceed from long-term shifts to daily transformations.

Regional Growth and Decline

Recently the United States has experienced a shift of population toward the west and southwest. Young people, job seekers, affluent retirees, and foreign immigrants are flocking to these warmer regions, where development (at least until very recently) has been running full steam. Older cities are losing population, especially from their inner areas. This drama is not new; Americans have been abandoning places since 1800, and the impact of withdrawal has always been painful. Public policy has been contradictory; on the one hand favoring growth—opening the West, building railroads, assigning new military contracts—and, on the other hand, attempting to reverse the effect of that growth in the depopulated zones—subsidizing declining industries, saving old buildings, attracting new residents to the emptying areas, supporting those

81 It may be as important to let places die as to stimulate growth. The American West has many towns that boomed until their mines were emptied, and which then became ghost towns. Bodie, a gold mining town in the high desert country of the Sierra Nevada mountains, had an estimated population of 10,000 in 1880. It declined precipitously in the early 20th century and is now maintained in a state of arrested decay as a ghost town. *(© Michael Southworth)*

left behind. Except for certain acts of historic preservation, the revitalization of some central business districts, and the reentry of small numbers of the middle class into a few inner city locations, these latter policies of reversal have not been very effective. They usually collapse into benign neglect, or require disaster relief until the trapped population dies out, leaves, or finds a reduced basis for its existence.

Managing Decline

In some degree, activities shift from one region to another because of advantages intrinsic to the new place: more space, better resources, better climate, or some other environmental amenity. Quite as often, the boom is based on some temporary advantage: an ephemeral resource, cheaper labor, the freer social climate of a new place, or the secondary stimulant of city-building itself. The boom may be released by what migration can shake off: the older workers and dependents, obsolete physical equipment, or encrusted political structures. Economically, the mobility of capital and labor has been advan-

tageous to us, clearly so in the short run, and perhaps even in the long. But it has also imposed hidden social costs: depression and heartbreak, the loss of social ties, the pains of new growth, the discard of still useful places and equipment. It has shifted some of those costs to those who do not profit by the move: to the elderly and the dependent, to the enterprises and communities left behind.

Regional shifts may be accounted favorable only when costs are paid by the migrant enterprises that benefit, when the old and the poor are not unwillingly left behind, and when social and psychological ties are not unnecessarily broken or traditions lost. Migration might then still be a net benefit, but the calculus must become more inclusive. A rational national policy would not seek to block regional movements, or to shore up declining areas artificially. Rather, it would seek to moderate the rates of growth and decline because very rapid change predictably causes trouble. It would attempt to reduce the costs of transfer, including the social and psychological ones, by ensuring that these hidden social costs are accounted for, and where possible, are charged to those who benefit from the move. Such a policy would also carry over to the new place the cultural connections that had flowered in the old one, thus making the migration psychologically more secure.

National policies might moderate growth and decline and shift some of the benefits to areas of need, without imposing direct controls on the movement of persons, firms, or capital. Thus the nation might identify those metropolitan areas that will in the near future have excessively high rates of growth ("import areas") or of decline ("export areas"). It might then set a limit for the net rate of growth of commercial space in the import areas, based on not exceeding the feasible rates of extending public services, or on limiting an undesirable rate of population change. Permits for this limited amount of new space, which might be sold annually to the highest bidders, would be required for the construction of any new commercial building in an import zone.

The nation might subsidize the voluntary migration of the poor and the elderly between export and import places, retrain the employable, supply advice and information, see that welfare, pension, and housing benefits went with the person, aid in the exchange of housing, and so on. The proceeds of permit sales, along with federal

subsidies, might be used to help an import area build the infrastructure and low-cost housing that it needs, consonant with its limited growth rate, or an export area to shrink by helping it pay closure costs of various kinds. Any employer transferring operations from one area to another could be required to pay for an equivalent move by his employees and their dependents, as well as to contribute some closure fee to the export area, covering necessary readjustments.

Would it be possible to foster relationships that pair an export and an import community in an effort to reduce the social costs of transfer? Moves by complete social groups might be encouraged. Employer-employee shifts could be coordinated. Information could be exchanged, people could be allowed to make trial moves or to enjoy home leaves, experienced public service teams might be supplied to the other partner, or mobile infrastructures be transferred. The rather empty ceremonies that now take place between sister cities such as Boston and Kyoto might then be based on a real social linkage.

Most of these possibilities depend on the power or encouragement of some entity large enough to contain both poles of transfer. They point, of course, toward the even more pressing need for international policy on the migrations of persons and capital. Standing alone, the declining community has much less room in which to act. Imposing closure fees, for example, if done in isolation, only further reduces the desirability of the shrinking area. The lesson of experience is that the waning region should encourage investment in new enterprise rather than bolster its old, declining firms; that it should welcome the investment of local capital more warmly than the introduction of subsidiary plants of remote corporations, which may as easily move out again.

Even by itself, however, a declining community can adjust to its losses, and perhaps find some advantage in them. Growing places have problems, also, and there are recognized ways of dealing with them: contingency planning, focussing investment on the basic public framework, controlling the key features of development, concentrating development in space and extending it without gaps, damping down or smoothing out growth that is too rapid or erratic, concentrating growth at threshold points when large supporting investments can be made, providing reserve space, continuous monitoring and troubleshooting, and so on.

Some techniques for addressing decline might simply be the reverse of these. The declining area could concentrate the zones of abandonment and conservation, so that services can be withdrawn selectively and the used areas retain their accustomed levels of upkeep and activity. It can set standards for mothballing unused structures and areas, including procedures for spatial bankruptcy. It will capitalize on some of the advantages of decline: a sense of history and of community solidarity, a lessening of burdens, a calmer pace, and more generous facilities, more housing space. "Densification"—the familiar accumulation of new apartments and rear lot additions—can now be followed by "rarefaction," a clearing and lightening of the urban texture. The town can dramatize its decline and make it meaningful—conduct solemn closure ceremonies, for example. (Could a mayor possibly run for office as "the man who helped Lakeville die"?) Managers could specialize in declining areas, analogous to the liquidators of declining business corporations. In present view, these devices are distasteful. We look on communities as rivals that must race against each other, some to win, others to fall back. A graceful decline is seen as no more than a confession of failure.

Continuity amid Change

The new settlements to which people are moving need equal attention. Welfare and services, teachers, social workers, doctors, and firemen must follow the move. What old physical equipment can be salvaged and transported? Migrants should be able to bring along artifacts around which their memories cluster: not only furniture, but pieces of buildings, stones, trees, signs, old pavings. They should be prepared for the new place and the new functions, be quickly reconnected into a social network. Indeed, the North American culture is familiar with migration: it has ways of making new friends rapidly, ways of moving on and letting go. But these are not publicly reinforced, and we let go too much. Our songs are eloquent of the pain of moving, as well as of its freedoms.

See figure 61

To maintain continuity in change, lost things can be preserved in condensed symbolic form, even when the real object has vanished. Old street life can be caught in photographs, and old cultures in scholarly records. A deliberate archive of place and behavior might be a supplement to policies of growth and decline. To some extent, vanished features can be reconstructed from such symbols. (We may soon have the ability to restore an extinct

species, if we possess a record of its genetic pattern.) But even information cannot be accumulated forever. Some of it must be thrown away, if only to increase our accessible stock of organized and veridical knowledge. Destroying records is as important as keeping them.

Planned Decline

New settlements should be planned to decline in their turn. Resilience should be built in, and a path along which the new area can return to its previous state. Some basic equipment could be designed to be movable, for example, or patches of the original landscape might be retained as seed lands for surrounding areas, when these later go to waste. A patchwork pattern, while providing reserve locations for new projects, could be the base to which abandoned areas were constantly being returned.

Wastelands have the peculiar advantage that they can be held unused without accounted cost, since they are presumed valueless. That holding state may have been achieved only after a long and painful period of declining value and failing hope, marked by the slow withdrawal of care. Abandonment is often a positive step, a flight from evil or to better chances, and the holding state has a future and even a present usefulness. Could the uncertain and painful process of abandonment be staged, ritualized, speeded up, more easily borne? Could spaces be declared bankrupt—tax free, value free, losses written off? The long wait until reuse would then no longer be an ordeal, and during that time the space could harbor, without shame, those ephemeral, marginal, relict activities for which wastes are so well fitted.

The value of any future use would then accrue to the community and its nature be subject to community guidance. One thinks of a rather slow-witted land bank, not mindful of return, not pressed to get its space back into active use, little concerned with maintenance, except when necessary to avert some direct danger. A Public Wastebasket—What a fine target for satire! But the acceptance of such an agency would signal an important shift in our ideas. We look on the emptying inner city as a desolation. Could it be a refreshing wilderness, close at hand, as long as people need not live in it?

Geological Wasting

We look on geological wastings with similar disapproval. In place of futile attempts to stop Niagara from eroding its bed, Martin Krieger has shown how the inevitable cutting back of the falls could be manipulated to dramatize both the awesome and continuous waste of

water, and also the equally continuous and far more stately waste of rock.[1] In response to pleas to save the eroding Gay Head Cliffs of Martha's Vineyard, which have been losing their bright colors, Clifford Kaye made a similar suggestion about accepting their progressive erosion by the sea; this exposes, one after another, the varicolored clays lying hidden in the earth behind the cliff face.[2] (But if one knew the sequence of colored beds that lay behind the cliff face, why not speed the erosion of dull deposits and prolong the exposure of vivid ones? Or expose different beds to make vivid compositions?)

Guidelines for Decay

Guidelines for decay are as important as guidelines for growth. Underused space, equipment, and services have their attractions, and so does the quiet nostalgia of genteel decline. Which elements must be maintained, and which let go? How can people and their activities be reconcentrated, as an urban fabric thins out? How is memory to be maintained, or transferred to new places? Can performance standards be relaxed, stage by stage, as pressures fall?

82 Niagara Falls represents an awesome and continuous waste of water as well as rock. Attempts to stop the erosion are futile, so why not dramatize the wasting? *(Niagara Falls Area Chamber of Commerce/New York Power Authority)*

Devices to stage and concentrate decline could be useful. Leases can be written to terminate at the same time over contiguous areas. Time zoning could also regulate abandonment. That is, a city might designate certain areas as relatively permanent, in which structures must be solidly built and permits for demolition rarely given. In other ephemeral zones, light buildings would be encouraged and clearance would be unchecked. Or successive liquidation dates might be assigned to areas well in advance, so that buildings had an assured life, and yet contiguous areas could be opened up to clearance one by one. There could be transferable wrecking rights, for example: in return for preserving a structure in some still active area, one could receive the right to clear and evict in some area slated for abandonment.

Planned Obsolescence

Buildings might be planned to decline gracefully. It would be ideal if the life probability of a structure matched its use probability, but the latter is hard to predict. It might be more feasible to make something of two classes of parts: the one long-lived, and the other easily replaced. Or, in addition to asking that an architect show how a building will look when it is occupied, he might be asked to show it remodeled for some other use, or as it will look in decay. Who could have guessed that the chaotic and pretentious forums of Imperial Rome would make such handsome wreckage? What will be the impact of a ruined glass tower? To ask for demolition plans for new buildings also seems reasonable. We already require record plans, and designers and contractors necessarily work out a proposed sequence of construction. Imagining its reverse adds only a small burden. Besides, thinking through a demolition sequence will also inform building design in an interesting way.

Wrecking is already a spectacle, but it could be sharpened with better information for the sidewalk superintendent. It is a skilled trade, and that can be communicated. Could spectators join the fun, or are the risks too great for that? We can plan for interim use and access to take advantage of the temporary open spaces that destruction provides. In addition to saving building materials for reuse, we can save the traces of past occupation in order to enrich future places.

Reuse

We might speculate about the reuse of typical contemporary elements, since in time all are sure to be abandoned. Such thinking prepares for the future, and, more

83 An abandoned quarry was transformed into a popular public garden in Vancouver's Queen Elizabeth Park. *(© Michael Southworth)*

important, helps us to design reusable things. Houses, lofts and sheds, small apartments and small office buildings, if well built, have always found alternate uses when their time approached. But we have more stubborn possessions on our hands, like the massive city walls or eroded landscapes of history. Today one thinks of parking garages, freeways, the vast pavements of airports, subways, skyscrapers, or missile silos. What will we do with them?

A parking lot can always be turned to some other use, but garages are a prime example of structures that resist recycling, due to the construction and dimensions. Since they are made of heavy reinforced concrete, they are not easy to demolish. A solidly built parking garage, for example, has a very low headroom, and a sloping floor. It is ill-lit and ill-ventilated, and lacks utilities and room for their installation. Can anyone name one which has been successfully reused?[3] It might do for storage, and its edges, where above ground, could conceivably be used for marginal shops, or as public balconies or theater seating. Perhaps it could be used for intensive farming under lights, or the raising of small caged animals and fowl. Despite the low headroom, intermediate floors could be

See figure 66

a flea market, a farmer's market, or some other temporary and unfocused outdoor assembly. Its roof, of course, would be useful for many open space purposes. On the other hand, if one can break through the floors, then the opportunities multiply around the new open perimeters. One can imagine a multilevel, sunlit parkland, with hanging vines and greenery at every level.

What will we do with disused freeways? Public routes through populated areas, if not too specialized (as the elevated train was), and if their continuity is not broken, retain their usefulness for very long periods. The old Roman roads are a good example. So even if a freeway were abandoned, we can imagine many new uses for it. Immediately, of course, we think of movement by other modes: walking, jogging, biking, bus routes, horseback riding, even boating along those that are depressed. In addition, they could be linear parks, and their verges and embankments could be planted to vines, trees, and crops. If elevated, their understructures can be linear buildings, or porticoes, or bulk storage spaces. Linear schools and other public facilities could be erected on them. They could be used for active sports: racing, swimming, archery. They could be a place for festivals and processions, or, more

84 What can be done with freeways after the automobile age? *(© Kevin Lynch)*

humbly, for drying grain or clothes. They might become light airplane landing strips, or long assembly lines. In contrast to the cramped and specialized parking garage, large network spaces tend to have a wide array of use. They should be conserved, and not frittered away, as happened to the street railway lines of Los Angeles.

An extended open area has the same generalized usefulness. An airport is essentially a large open ground with a series of wide-span structures at one edge. The great runways can be pavements for all sorts of uses, or they can be broken up to rediscover the earth. After World War II, the military airports of England made very good farms, and their runways useful hardstands.

Even abandoned rail subways, which seem so much more confining and restrictive, can be reusable networks: for protected storage or manufacture; as retreats from allergens, smog, inclement weather or attack; for freight transport and utility runs; for underground galleries, walkways, bikeways, or as ritual places and cemeteries. In fact, most of these uses have, at one time or another, been inserted in them.

Look at another difficult one. What if an old skyscraper is no longer needed for its offices or apartments? Since most of these towers have been built at the intense center of the city, those we have lost to date have almost all been torn down and replaced by even taller structures. Their demolition is quite a feat, accomplished floor by floor, the building collapsing inward, lest its falling debris kill those on the street below. The cost of its removal must be absorbed in the profits of its successor. But we are now beginning to see a skyscaper boarded up here and there—in the old financial district of Los Angeles, for example. The scale and height of these structures magnifies the problems of recycling and also the dangers of leaving them empty. We could use their facades for spectacular lights and murals, and might modify them to collect solar energy or to reflect sunlight where it is lacking, or to deflect wind, or to capture wind energy. Their tops, of course, can be observatories, landing pads, and platforms for skydiving and other thrills. Could the towers themselves become aviaries, or vertical green houses, or wilderness retreats? My speculations are strained. Their most likely reuse is their original use: offices or apartments, which require the retention of all their complex utilities and lifting devices. Mostly then, we must take them down.

And what will we do with the old missile silos, which are skyscrapers upside down? Storage pits or cisterns, we suppose, mushroom farms or vineyards under artificial light, cemeteries or picture galleries with spiral ramps? Or just seal them off and let them be, hoping that nothing will break through their covers. Old mine pits have similar ends, and sometimes threaten large areas, as they sink and collapse. Yet the deeper, horizontal galleries of the mines, if large enough, have proved valuable as safe storage. The huge cool galleries of the old salt mines have been especially useful.

What would we have done with the MX system, that stupendous underground missile ballet, once it no longer sufficiently frightened us and our fellows across the water? In scale and futility it rivaled the Great Wall of China. Soon enough, it would surely have been abandoned, if we were not destroyed first. What would have been left? Handsome ruins? A useful rail network, as the basis of some new settlement in the inhospitable desert? Something to see from the moon? One way of thinking about war is to think about the debris it leaves behind.

In these speculations we discover, perhaps to our surprise, that some of these things have a viable future. We learn that future-regarding structures have particular characteristics; these include modest scale, low density and height, generous interior or exterior open space, separable parts, "patchable" construction, and extensive connected networks. Freeways, airports, and even subways score well; parking garages and skyscrapers look more like disasters. Requiring the speculative redesign of any proposed new structure for some markedly different new use is a significant test of its quality.

Indeed, one way of thinking about the reuse characteristics is to imagine some cataclysm that destroyed our society but left the structures intact. How well would the surviving physical equipment provide for a new start (if that were possible), how much would be unfit for any new functions, or even obstructive? However staggering the social disruption, it seems likely that the contemporary low-density urban settlement would have extended usefulness for a society thrown back to square one. The many small buildings could shelter a thousand activities, and the old machines would be mines of metal and parts. The suburban gardens could be replanted and the paved streets would serve very well for foot travelers and cars.

The drainage and water pipes would retain their usefulness. Our heirs would be more likely to curse us for the poisoning of land and water, the human losses, the guilt and fear and social disorder, or for earlier wrongs such as soil erosion or the depletion of fossil energy. But the physical remains would also be a psychological burden, the symbols of the human catastrophe.

Rehabilitation of Suburbs

The growth of the residential suburb has been the principal occasion for the decline of inner city housing. Now its own time is coming. Already in such rapidly transforming cities as Los Angeles, we see patches of abandoned suburbia. The planned replacement or rehabilitation of the mature, moderate-income, low-density suburb will be a challenge to the next generation. Built lightly and almost at once, dependent on the reach of the automobile, suburbs were at first largely homogeneous, socially and physically. Now suburban houses have been remodeled, and the suburban population has diversified in age and class. Transport and finances are at risk, yet this is where most of our people live. The single-family house is still desirable, and in most places its market value is sustained, but such a house is difficult to keep up. The suburb condemns the young and the old to dependence, and the car becomes more expensive daily, killing people of every age.

Rehabilitating the suburbs will require new thinking. The changing role of women is profoundly affecting the isolated family, the raising of children, and the relation of domestic labor to paid employment. New housing types must be inserted, old houses remodeled, average densities raised, a more diversified set of activities encouraged. New family types—singles, group families, all male or female—will share the houses. Provision must be made for new group services: food preparation, house cleaning, daycare. Local streets must be replanned to civilize the car and to supply usable open space at the house door. The commercial strips along the arterial streets need renewal, and so do the once-bright shopping malls. More food can be locally grown, and the energy of sun and wind can be locally captured. Transit systems that work at suburban density must be put in place: small busses, group taxis, car sharing, hitchhiking, bicycles, and new lightweight vehicles. Local employment need no longer be banished to remote industrial and office parks. New populations will move in, perhaps under "sister"

arrangements with inner-city areas. Neighborhood control could increase, and new public capital will have to be invested. Certain areas must be returned to waste. It is hard for us to think that something so relatively new may already be changing, already be dying. We see it as failure, but it is rebirth.

Abandonment of the Automobile

Can we forsake our automobiles, a contingency that is at least thinkable? What will happen then to the suburbs? to vacation areas? to industries whose employees commute by car? to the entire apparatus of making and maintaining those beautiful machines? What may be the effects on courtship, on the dependence of young children, and on the acquisition of mechanical skills? To what will we displace our affections, and our display of social position? What will happen to death rates and accident rates? For all the uncertainty about the supply of oil, we will hold tenaciously to the individual vehicle, and some form of it will persist, however modified. It may be a low-powered bicycle, or a public vehicle to be found for hire on every street, or a private one used only occasionally for a substantial user fee. Cars are deeply rooted in our habits, dreams, and satisfactions, but shifts are on the way, and sensible planning would prepare for that.

Mobile Homes

We now see the first abandonment of the trailers and mobile homes of the forties and fifties. It is a new phenomenon, similar to scrapping an automobile, but the pieces are larger. Which parts might be reused, which easily degraded? Once again, no one looked beyond the point of sale. How can old trailers be collected, and where will they be put? Could they have second uses as cheap institutional space, or be reserved for children's play? Might they be rehabilitated and brought together for inexpensive housing?

Recycling

Present thinking about waste disposal focuses on efficiency, and particularly on how to extract more use from what we discard. The composting of garbage and vegetable trash is advocated, as well as the conversion of municipal wastes into energy; the use of building rubble and fly ash as aggregate for roads and building blocks; sulphur wastes as road paving; old vehicles as artificial reefs in the sea, to encourage fish life; the extraction of methane from old garbage dumps; the recycling of buildings instead of demolishing them; the reuse of old paper, bottles, lumber, and cans; and the efficient interchange of chemical by-products. California set up a statewide system

85 California now has a statewide system for collecting recyclable plastic, glass, and aluminum. Colorful collection containers are placed in strategic locations such as supermarket parkings lots. *(© Kimberly Moses)*

of contacts between manufacturers, to increase the exchange of waste by-products. Gardeners are taught to make compost to improve their soils, and homeowners are urged to reduce the outward flow of waste heat by means of insulation.

Although people can be persuaded to save without personal gain, the strongest motive here is economic: to increase the efficiency of the wasting process. Measures of efficiency are sensitive to all the costs of production, and so societies in which labor is cheap and materials dear will appear to be wasting much less. Lives may be wasted, of course, and processes may be far less productive than those in developed countries, which generate mountains of trash.

Raising the cost of raw materials is one means of reducing waste, since producers will shift to recycled materials and begin to substitute labor and technology for raw substance. Whether this is a socially useful shift depends on how we value those different inputs, and, whether, in our view, the wasting process will then become less disruptive. Where material is plentiful, and wastes can easily

be accommodated, such methods will be unnecessary. Amidst our present pollution and heavy draw on energy and material, a slower throughput must be assumed to be advantageous until tested against other alternatives. The reuse of a building can sometimes be more expensive than building new, but the possibility of reuse is always worth at least a calculation. At any rate, increasing our technical skill in using wastes increases our choices in managing the stream. So new waste technology—the "technical fix"—has been seen as our principal hope.

Intentional recycling is expensive, due to the labor and energy required to sort out and detoxify any noxious material and then to reconcentrate the valuable components in useful form. Separation and reconcentration of wastes at their point of generation would make recovery more feasible. Home compaction, for example, would save handling costs.

Wastability

New products raise disposal costs, when they are not easily absorbed in natural cycles, or when they increase the disorder of the waste material. The substitution of plastics in automobile bodies for example, will make their reuse for scrap metal more difficult. The design of any new product should include a design for how it will be disposed of, and an estimation of the resulting costs and benefits. The invention of a new chemical product should require the invention of its safe disposal and the disposal of the by-products arising in its manufacture. This concern with disposal might also encourage packaging that is separable from its contents, or even, like the ice cream cone, usable along with its contents.

We have come to the point of demanding that new products be tested for their effects in use. Drugs are checked for toxicity, and new building products for flammability; mandatory prior testing is gradually spreading through the ranks of consumer products. The requirement means more public regulation, with its attendant costs, conflicts, and opportunities for corruption; also greater delays and higher start-up costs in production, thus higher prices and slower responses to need. In threats to our health or security, we think that this is worth the cost. Moreover, if producers are convinced of the value to them of the restraint, then compliance becomes voluntary and the cost of regulation eases. A successful regulation has an objective that is clear and generally agreed upon, and a method of enforcement that is flexible, low in cost, and,

if possible self-enforcing, or at least decentralized. Requiring the listing of food components on the label of a can or package is one example of such regulation. This principle of disclosure might be extended to include the "wastability" of any new product. Asking for disposal plans for any new chemical product seems reasonable, considering the serious waste consequences of such substances, and that the plan need only be done once.

One can go further and require that some products prepay the cost of their disposal, in effect a burial fee. This is the successful strategy of the "bottle bills," which require a deposit on a bottle that is refundable on its return, or the returnable deposits now used in Sweden to deal with abandoned automobiles. Soap powders can be taxed to pay sewage costs, strip mines to pay recovery costs (the policy in Britain), and chemical industries to pay for removing toxic dumps. These stricter measures are justified where the potential damages are severe and the waste source easy to pinpoint, as in the case of the strip mine or where prepayment is much less costly than postpayment, as in the collection of bottles.

Materials easy to recycle or to dispose of might be encouraged. Things can be designed to waste in a relatively pure form so that their residual value is more easily extracted. Our reliance on water and air as the carriers of our diluted rejects brings on recurrent shortages of the solvent and imposes great costs for undilution. In this sense, waste dealers and ragpickers are useful concentrators. We can search for ways to speed the flow of waste. Settling basins and aerating tanks accelerate the natural processes of separation and breakdown. It has been proposed that a free radical scavenger be released into the air over our cities, to take up the nitrous oxides and hydrocarbons generated by automobile exhausts before they can be photosynthesized into smog. This might well be cheaper, and easier to control, than maintaining catalytic converters on every vehicle. But there are unknown dangers in releasing such new substances in the air we breathe. We should remember the release of the rabbit in Australia,[4] and of the gypsy moth in North America. One of the arguments for research on recombinant DNA was that it would permit the development of a strain of bacteria that would eat up oil spills. Opponents wondered what might happen if that strain broke loose and ate up our oil supplies.

Optimum Rates

Think then of the whole stream, from manufacture through use and reuse to disposal, as the test of value. Wasting in earth, air, and water must be seen as a whole. Optimum rates may be identified, to be reflected in the rates of production and consumption. "Waste emergencies" might be declared, just as supply emergencies are declared when there are shortages of water, food, or fuel, to impose constraints on consumption. We already declare "smog alerts," which are advisory for persons at risk, and set limits on car use and factory emissions. Restraints on eating or excreting in a waste emergency would be lunatic, but limitations on packaging, or the distribution of paper or chemicals, or the use of toxic substances, or on toilet flushing, are at least thinkable. Might especially noxious substances be given vivid tracer dyes or odors—as cooking gas is given an unpleasant smell—so that their presence in the waste, and their source, would be easy to detect?

Attitudes Toward Litter

Reducing litter and keeping surfaces clean would not seem to have this same urgency, as long as the uncleanliness does not directly threaten us with disease. But the two most vocal criticisms of our cities are that they are unsafe and they are dirty. One way to deal with that discomfort might be to change normal attitudes—to persuade people to see something interesting in litter. But since the actual value of litter is low and the feelings of revulsion are deep seated, the psychological maneuver would be forced. Yet if people were not quite so horrified by trash, so convinced that once tossed out, it should by all rights disappear, they might be able to control litter better. Paying attention is the first step. Concentrated trash is not dangerous, and it *can* be interesting. Dispersed litter, however, is an unsightly bore.

What might simplify trash collection? New technical devices such as compacting trucks are useful, but disposal works best in areas where there is a personal responsibility for cleanliness, and where the cleaner is thought respectable. House-proud cultures are notoriously clean. When Colonel George E. Warring, Jr., created his uniformed "White Wings" in 1895 as a new elite street cleaning force in New York City, he revolutionized the sanitation of the streets, and lowered costs as well.[5] Littering is notorious, on the other hand, in high-density or nonresidential areas, where no one "owns the street." Moreover, city sanitation workers do what they can to live up to their lowly reputations.

New technologies will not repair these evils. Draconian rules will have some effect, such as New York's recent ban on dog shit, which has impelled some pet owners to collect the stuff as it is put out on the sidewalks—and given rise to a "Pooper-Scooper" industry—or the stiff, on-the-spot fines levied for littering in the Soviet Union. Habits do change under such pressures, especially if they can be linked to a general social condemnation: witness the decline of the spitting of tobacco juice in this country. But this required massive propaganda, the rise of more fashionable ways of consuming the drug, and time for the slow shift of custom. Most of our anti-litter laws are a deception. Their ineffectiveness only reinforces our sense that the problem is hopeless. What, then, if we should institute a variant of citizen arrest? Anyone may pick up something that he sees someone else drop, and collect the fine for himself, on the spot, like an informer's fee. What conflicts that would engender!

86 Colonel George E. Warring, Jr. made street cleaning respectable and effective when he established the white uniformed street cleaning force "White Wings" for New York City in 1895. *(The City of New York Department of Sanitation)*

One well-accepted mode of handling a treadmill task like waste collection is to concentrate the operation. Designate some areas as clean, and others as dirty, to focus effort. We throw paper on the street but not on the carpet. The plaza is swept, and not the back street. Cleaning services are withdrawn from low-income areas. It might be more just to shift that focus to the arterial streets and the low-income high-density areas, while encouraging residents living at lower densities to take greater responsibility for their public spaces. Sweeping and collecting could be a local task where citizens feel that the street is their own and that it will not be invaded by alien refuse. Local emulation can be stimulated, as in the "clean block" campaigns of central Baltimore.

Efforts can be concentrated in time, as well as in space. There could be customs of periodic public cleaning, like the half-forgotten spring cleaning, or the purification rituals of many traditional societies. Cleaning then becomes a ceremonious event, a way of gaining prestige. The housewife who publicly scrubbed her front step was a good wife—in another era. Special age groups might take on public cleaning tasks, like the "little hordes" in Fourier's utopia,[6] and as the "White Wings" began to do in New York before they collided with the sanitation union. Managing trash is inevitably labor-intensive. Raising its status is a key to managing it well.

Bounties for Trash

One economic device comes to mind, the old device of the bounty, which sets an artificial price on some unwanted thing to bring about its removal. What if a city, in place of its regular collection system or of some part of it, simply offered to buy any trash brought to its disposal point? Competing collectors would then appear, children among them. Trashing rights might be purchased, and trash be stolen. There would be trash raids into other jurisdictions. Old houses, with their accumulations of refuse in attic and cellar, would increase in value. Previous illegal trash dumps would be gutted, and public disposal sites would have to be secured against thieves.

Clearly, a price would have to be set that was comparable to, or less then, previous collection costs, and yet sufficient to ensure the collection of the more difficult deposits without being so high as to encourage deliberate creation of trash. Rules would be needed for the condition and minimum amount of trash to be bought. Would unacceptable stuff then be thrown off at the gate? The

policy could only be instituted on a comprehensive scale; otherwise one locality would be inundated by the trash of an entire region. Gate prices, however, could be adjusted between convenient and inconvenient disposal sites, in order to equalize the inflow. The transition would be difficult, as public sanitation workers were discharged (they might go to work on their own account), and as the accumulated refuse of the years was being mined out. Yet such a device could be worth some thought and even trial. Instead of looking nasty, wastes might begin to look like treasure.

Since regulated dumping is expensive and often remote (no one wants a dump nearby), there is a constant temptation to dump illegally: at the curb, in vacant lots, or in odd, unsupervised public corners. One deterrent is regulation and penalty. This is not very effective, as we have seen, unless a sufficient police force is available, or the local citizens have a strong stake in prevention. Another way to avoid illegal dumping is to buy trash, as we have suggested above. Still another is to make legal disposal easier by designating nearby, scattered sites where wastes can be left at low densities. This first stage of concentration allows a relatively efficient pickup by a public agency at extended intervals. The difficulty is one of supervision: keeping out toxic material, preventing pollution of air or ground water, seeing that material is sufficiently sorted to allow efficient treatment thereafter. In a well-regulated community, these aims may be achieved with only sporadic supervision. Elsewhere, regulated hours and personal attendance would be necessary.

Durability

Confronted with our trash mountains, the normal reaction, other than looking for a technical fix, has been to decry our rate of consumption, and to demand that (a) we use less, and (b) the things we use last longer. The first is a harsh demand, but it may be forced upon us by rising prices and scarcities, or even by shame at the world's inequities. Surely it will not come easily; nor will those presently deprived be stirred by any such appeal. But it is possible, once one is materially secure and has experienced abundance and unease, to develop a low-consumption ethic, finding elegance in scarcity. So we can look on this as a long-range tactic. It may be that a robust rate of wasting is appropriate in the early growth stage of a society, but can be surrendered gracefully in maturity. If nonwasting were actually practised by the affluent in

some "developed" nation, could it ever become one of those cultural traits emulated by those in an "undeveloped" nation?

The demand to use less may be burdensome, but the second demand, that things last longer, is unthinking. If we look at the extended costs of something, it is sometimes true that a more expensive but more durable object will cost less over time, while giving us the added satisfactions of a familiar, well-used thing. But other objects will be cheaper if more ephemeral, while putting fewer constraints on our future. Ephemera have their own emotional attractions. Shorter life may be preferable in certain media (libraries have great difficulty culling out unused volumes, for example), in ordinary clothes and dinnerware, even in factories and houses. Disposable tissues are admirable, considering the late pocket handkerchief, its contents, and the work of washing it. The optimum life of a thing depends on the relative costs of making and maintaining it, to which we must add the cost of disposing of it. Our affection for some quasi-permanent object may be offset by our boredom with it, or by the way in which it cramps our future. There are times when we say good riddance.

Neither shortening nor lengthening product life can be a general principle. The strategy, rather, is to fine-tune the durations of things, now avoiding cheap things that break too soon and clog our trash cans, now expensive objects that last too long and clog our lives. Managing duration will include seeing that all components of a product have similar life spans and synchronously waste together, or that components of an object are separable, some of them easily wasted and the others easily recycled. Things are rarely made with repair and disassembly in mind. Could the advantages of mass production be applied to rebuilding, as well as to making new things? Could production lines be devoted to manufacture in reverse, that is, to the systematic *dis*assembly of machines, in order to recover their usable parts? Due to the intricate ways in which things are put together—patterns that are aimed at rationalizing assembly—most reconstruction becomes skilled hand work.

Asking that products contain instructions on how to repair and also dismember them would help. Organizing enterprises that systematically rebuild things for profit (as in the rebuilding of gasoline engines) would be even

87 Berlin's Mount Junk, a hill 360 feet high made of war debris, has been turned into a public park used for hiking, picnics, skiing, and tobogganing. It was the best place to get views of East Berlin when the city was divided. *(Landesbildstelle Berlin)*

more effective. A market is thereby created for used things and a premium is put on rebuildability. If there is some way of ascribing value to the entire life of objects, then good repair and good wasting will be a common concern. The trick—it is not such an easy one—is to convey the residual and intermediate values of a repairable and wastable object back to the original maker.

Legal problems complicate these efforts. Throwing something away is really a protracted process, with frequent opportunities to reconsider. The law looks for a single moment at which ownership ceases, in order to make judgements in contested cases. Can I acquire someone's mail when he has put it in the can? May I seize the car she left at the curb? When may the city take over an abandoned house? Until the cessation of ownership is clear, and the point of transfer identified, the disposing of semipermanent things is touchy and requires complex notifications.

Accumulations of refuse can make useful terrain. Berlin's "Mount Junk" (officially named Teufelsberg, literally "Devil's Mountain") is famous: a hill 360 feet high, made during the 1960s and 1970s from the rubble of the bombing, it is now covered, planted, and used, in that flat, sandy plain, for skiing, tobogganing, an observatory, a vineyard, and a lookout (providing the best views of East Berlin). The president of the New York City council had dreams of a Grand Teton of garbage in Pelham Bay, a mountain of compacted refuse half a mile high, which could be used for recreation on one side, even while it was still growing on the other.[7] Similar hills have been proposed for flat Chicago, hills that might reach 1,000 feet in 20 years.

Future Recovery

Waste heaps become useful sources of energy or matter, as prime resources dwindle and new technologies develop. The prehistoric shell middens of Brazil are today's concentrates of agricultural lime. Old mine tailings are reprocessed to extract their minerals, and methane gas is drawn from garbage dumps. Old buildings are low-cost stores of timber, stone, brick, and metal. The rubble of a ruined city is the valuable concentrate of material taken from far-flung quarries. Litter, on the other hand, is a useless scatter that demands energy for collection and sorting. It may therefore be our responsibility to waste in such a way that we facilitate future recovery, leaving a good lode. Things not intended to be recycled now—

whether by ourselves or by other living creatures—should be left in safe and stable form, relatively pure and concentrated, in some well marked and accessible location. In that sense, privies are better than flush toilets, sorted dumps better than indiscriminate landfills, and charnel houses superior to graveyards. Old machinery can be compressed and left to form iron mountains. A land dump is better than the sea, since the material is less likely to migrate or to lose its purity; it is also easier to locate, more accessible, and more readily reworked, should anything go wrong. A dump of segregated material is better still. Records of location and composition should be kept. Much of the cost of resource extraction is expended in finding what and where things are. Why not make it easier for the future miners?

Uncycling

It is more urgent, for the safety of future generations, to record the locations of toxic wastes. We are just realizing what secret dangers we have strewn across the land, after several generations of unrecorded industrial wasting. Our principal policy should be to keep resources circulating without irretrievable loss, but some by-products may pose such high and protracted dangers that we will look for a permanent sink for them: we want to uncycle. Undoubtedly, we should first avoid creating such permanent risks, but once we have done so, we must find a safe hiding place for them. High-level radioactive waste is the prime example of this terrifying problem. In panic, we think of putting it in salt mines, or in the deep sea, or sealing it in glass, letting it melt into the polar ice pack, or shooting it into outer space (surely the ultimate mode of sewage disposal, but even that one will catch up with us, should we survive). We have to remember the coming ice age, and the possibility that a future civilization may inadvertently drill into the deposit. So the grave should be remote from any mineral-rich area, and the location permanently marked. But what minerals will attract the earthlings in that remote future? How will they read our signs? The problem is intriguing; this may be the first time that any civilization has explicitly attempted to communicate with a remote future one. But what a burden to lay upon the earth!

See figure 24

Rituals and Celebrations

It was the Irish custom, before leaving on a long journey, to sit down at the last moment, without speaking, thinking together about what was being left behind. The moment of parting was a ritual time, enlarged in meaning

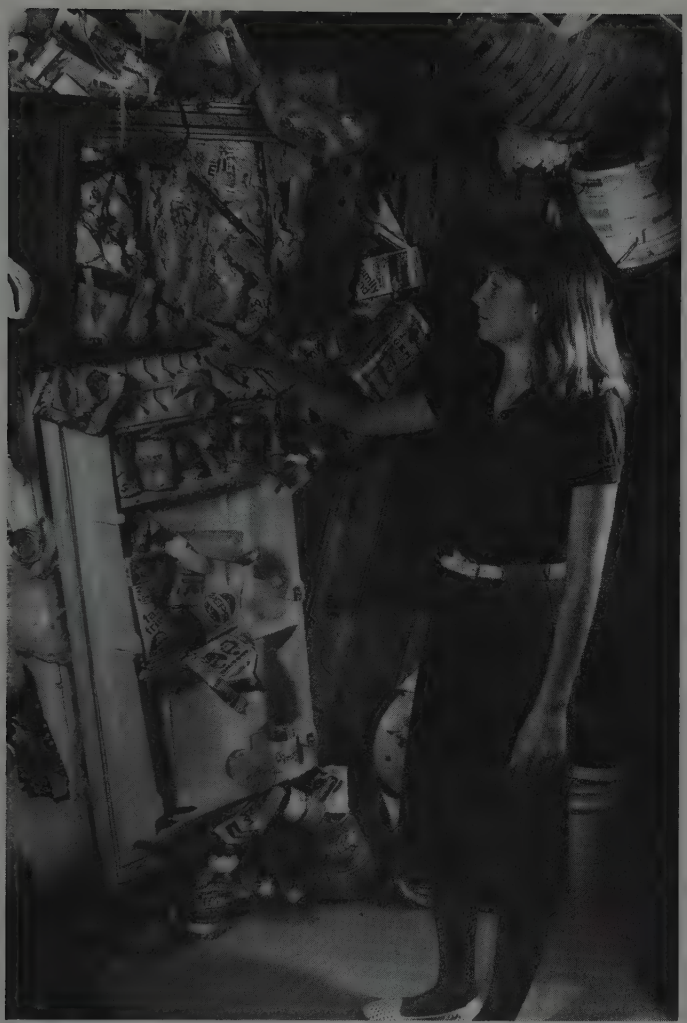
and kept in memory. We need rituals of that kind for saying goodbye to places and to wasted things, some act that is an acceptance of parting, something to remember. Cutting the ribbon, turning the first shovel of dirt, are opening ceremonies, performed rather awkwardly by elderly presidents and politicians. At the other end, we might allow the taking of souvenirs, or a tossing of keepsakes into the old cellar pit, as it is filled in. At the demolition of the Baker Hotel in Dallas, which had been the prime social center for middle-class parties and dances for generations, a last party was held in the old ballroom and on the street below, which was closed off for the event. We could celebrate demolition, as well as hold closing rites. A moment of common silence, just before the wrecker's ball is swung, could be a moving ceremony. Might we even allow communal trashing?

Beyond the passage of a single building, could we celebrate the death of an entire place, or the passing of a skill or a way of life? We need customs of reenactment, of leave-taking, of record and memorial, of sealing and sanctifying. The protracted, invisible demise of a place or a culture, like the whimper of an ill-managed death, leaves a painful scar. Ceremonies alone will not abolish sorrow, but they do offer us support and a means of expression. If grief does not disappear, horror and confusion can be overcome.

More profound changes in attitude require the reorganization of internal concepts and emotions, such as can occur in religious conversion, or after some traumatic event. A deliberate engagement with the wastes we most despise would be the radical approach, a painful immersion prolonged until we suddenly found some new meaning. Gandhi preached a close association with human excrement; Japanese Buddhists advised meditation in the presence of rotting corpses.

Learning About Waste

Such radical measures are not likely to be widely accepted. Less traumatic associations can give us a more balanced view of waste, however. Sewage plants, garbage converters, and landfill sites are interesting operations to visit, and scheduled demonstrations could enhance that interest. "Dumping"—the exploration of rural dumps for usable articles—is already an established custom. Organized field trips to local dumps under the guidance of archaeologists and historians could be interesting. Citizens held a party in one dump on Martha's Vineyard to mark



88 A museum of garbage has been created on a landfill site in Lyndhurst, New Jersey. Visitors enter through a simulated dump (without the odors). Exhibits address questions such as: Where does garbage come from? Where does it go? What impact does what we throw away have on the environment? *(Hackensack Meadowlands Development Commission)*

the opening of a recycling station. A return of compost or building material might be made to users of a waste station, in proportion to the waste supplied. There could be honors for good wasting, just as there are honors for good production. People can be trained to take interest in disposing well. Religious and cultural taboos could be

introduced to prevent the mixing of wastes where we are sure of the permanent desirability of some separation, just as religious sanctions now prohibit mixing certain foods.

Penetrating more deeply in our culture, we would look for ways of removing the shame of excretion, which makes its facilities inaccessible, uncleanable, and uncontrollable. Could people be taught to defecate gracefully in public—the art and manners of letting go? We think it ugly and a danger to morals. Any effort to change that attitude would surely create shock waves in our society, yet several other societies are much less concerned about it than we are.

The Art of Wasting

There can be an art of dirtying and cleaning. It is a pleasure to wallow in the mud, and then wash it off. Eating, the destruction of food, is enjoyable as long as it is well mannered and not carried to excess. Certain arts of wasting already exist: bonfires, feasting, junk art, pageants. Our emotions should distinguish benign from destructive waste, what is life-enhancing from what is not. So Gandhi urged soldiers to give up the waste of war, and clean their country. Fear and shame should be linked to the more durable evils, like radioactivity.

Time Waste

Wasting time is also a grievous sin, so we are told. And yet it has its reasons. It is more than just a rest that allows us to work again. It can be a way of increasing the worker's control of production, for example. It can also be a refined pleasure. There is an art to wasting time: doing so with delight, creatively, without guilt or apparent effort, without boredom or personal stagnation, without doing harm to others. This is an art usually reserved to a small upper class. Well-wasted time has produced many delights and some great cultural achievements. It is active and engaging; if well done it is as absorbing as any work. Indeed, it is work beyond the conventional margins of accounted cost and benefit. As already mentioned, the bridges of Maillart are quite inefficient by any usual calculus, because they save material at much expense of labor. They are elegant monuments to the waste of human effort. Or consider Simon Rodia's marvelous towers in Watts, a neglected part of Los Angeles—they were built of scrap material, for no direct purpose, on endless evening and weekend hours. What a waste of time they were!

See figure 5

Waste of Life

Boredom and repression, however, are true losses, since they waste human abilities. A repressive society, or a repressive self or worldview, which imposes nar-

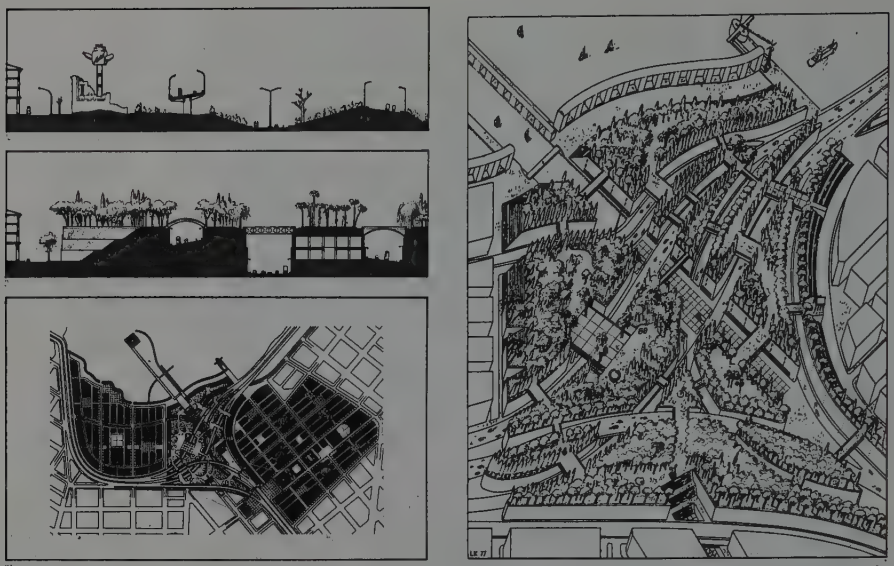
row attitudes and narrow actions, is thus a waste of human potentialities. The waste people in the refugee camps of the world waste not time but themselves. Such a flow of human existence that might be creatively engaged! Dramatic rioting is one cynical suggestion for achieving engagement in that condition. Refugees come alive when they engage in political struggles for freedom. Could they build monuments to starvation, hope, and dislocation? How is time best wasted in a concentration camp?

Waste Art

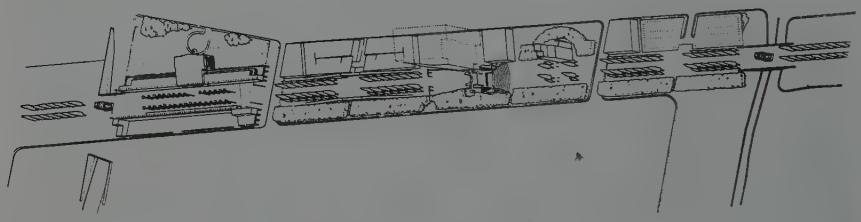
A monumental art of waste may seem too close to tears, and yet satire is also a way to make the world meaningful. The ruins at the zero point of the atomic explosion at Hiroshima are certainly a vivid memorial. In a long-abandoned mining camp in the Arizona desert, among some rather dowdy ruins, there was a great heap of empty whiskey bottles, shining in the sun. The symbol was apt, and also beautiful. Special dumps could be preserved as historic landmarks, just as we preserve ruined castles. Tour maps of local wastes, ruins, and remnants

See figure 8

89 In Tonopah, Nevada, a monument to those who lost their lives in a disaster at the nearby bombing and gunnery range during World War II was created out of the waste of those disasters. The remains of the B24 Liberator bomber that were recovered from the site of the crash—propeller fragments, pieces of engine, as well as weapons and bomb casings—are incorporated into the monument. Site markers are fabricated of airplane metal from the crash. *(© Michael Southworth)*



90 Leon Krier's plan for reuse of the Athens-Piraeus highway interchange creates a public garden made up of a series of green islands linked by bridges. *(Leon Krier,* Lotus International *31, 78–9, 1981)*



91 *Regina Traces,* Saskatchewan, 1975. A group of designers in Regina proposed converting an old railroad corridor into a formal arcade of tall trees. At the city periphery it would join the greenbelt. In the city center a section of it would be glass covered and planted with palm trees. *(George Baird, Donald McKay, Barry Sampson,* Design Quarterly *113–114, p. 29, 1980)*

could be provided. The Wairakei geothermal power station in New Zealand wastes its steam from concrete towers and a maze of pipes—roaring, hissing, and rumbling despite all efforts to control the clamor with silencers. This noisy wasting has become an awesome tourist attraction, just as the flaring of gas at oil refineries is their most striking nighttime feature. These pleasures can be enhanced. Trash heaps can be shaped: pyramids of plastic bottles, mazes of rusting radiators. Dirt from city excava-

tions can be decorated, snow cleared from city streets can be colored, or given fantastic forms. Color might trace the mingling of liquid wastes, just as oily pollutants form wonderful swirling sheens on a river surface.

In a design for an abandoned highway interchange, Leon Krier proposed to replant its flowing curves as a terraced park, while cutting its continuity in several places—both to deny and to dramatize its former function. Designers Baird, McKay, and Sampson propose to turn an unused railway line, in a wintry prairie city, into a linear greenhouse of palm trees, confronting weather and former function alike.[8] Gordon Matta-Clark splits open discarded buildings by a vertical cut, to reveal their history or "soul"—a compelling sight we see only fleetingly in the chaos of city demolition.[9] These are arts of temporal collage, using fragments of the old in contrast with the new, to sharpen our perception of both.

The defiant use of salvaged material to build new buildings is another example of this same art, an approach launched by the German Dadaist Kurt Schwitters, when he combined various German objects to make his first *Merzbau* in Hannover in 1923.[10] The communes of the

92 *Splitting,* 1974. Abandoned houses inspired Gordon Matta Clark to deconstruct them by cutting huge holes in walls, floors, or roof. This house was cut completely in half. *(Courtesy Holly Solomon Gallery)*

93 Kurt Schwitters, one of the first artists to use scrap materials in his work, made his Hannover *Merzbau* in the 1920s of wood, cardboard, plaster, scraps of iron, broken furniture parts, picture frames, and other found objects. *(Photo: Sprengel Museum Hannover)*

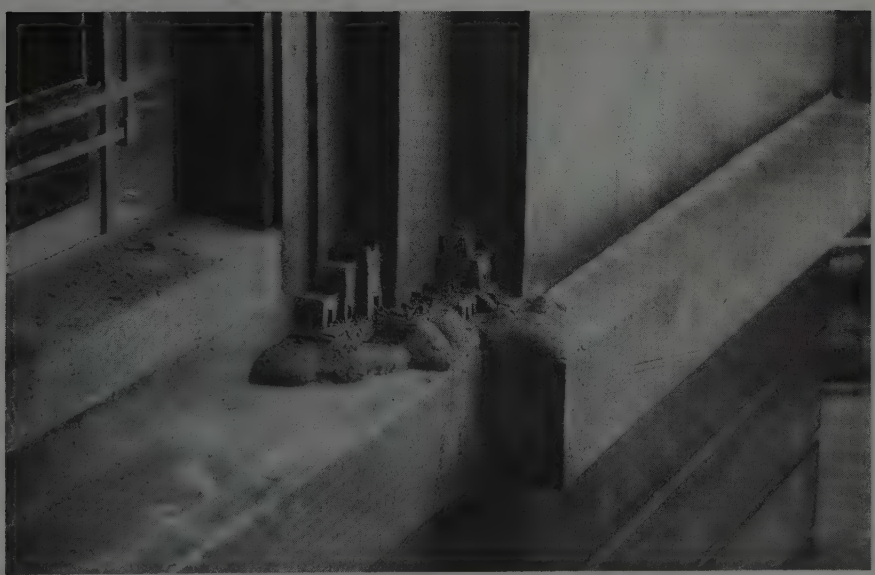
sixties carried on that tradition, intending to satirize our consumer society and to identify themselves with the squatter settlements of the Third World. In their words, salvage structures were a "high polemical art." But they also appreciated the expressive form that was released, the easy behavioral fit, the way that growth and past use were clearly symbolized, and the fact that such structures became richer over time.

Many artists have taken conscious positions on this issue, focusing their work around the beauty and necessity of decay. Robert Smithson wanted to make rusting and

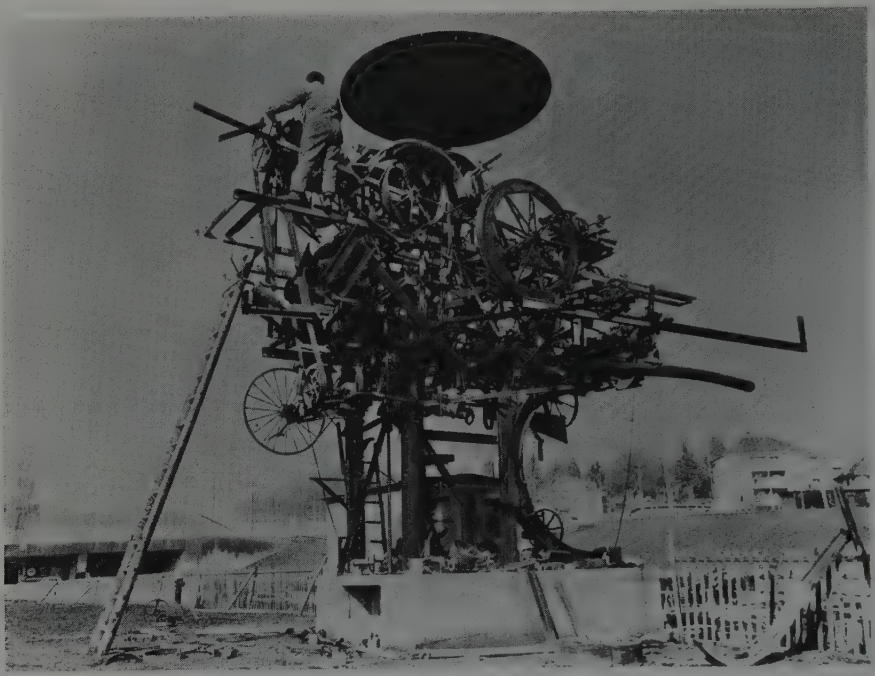
erosion striking to the eye. He coupled waste with the enjoyment of life, and described his own fascination with wastelands.[11] Architects and preservationists, he contended, value self-contained, ahistorical things. They give no thought to ruin—to how a building, mine, or farm might look *after* it has been used. The Bingham copper pit in Utah is now a stupendous hole, one mile deep and three miles across. If conservationists were to ask that the mines be put back the way they were, the Bingham pit would require the dirt of another mountain. Meanwhile, its vast excavated terraces have a grandeur of their own. We should accept change, Smithson thinks. It goes hand in hand with tranquility. Things flow endlessly from state to state, without return. The stillness is in the hurricane.

See figure 28

Charles Simonds made tiny clay villages for "little people," on the ledges and crannies of the Lower East Side of New York.[12] From 1971 to 1976, he built 250 such places, in unexpected and vulnerable locations. Some were destroyed within the hour, most in a few days; some few lasted as long as five years. Built of tiny bricks, the houses appeared and disappeared. There were ruins



94 Charles Simonds' miniature villages are built in surprising and vulnerable locations. They are fantasies of fragility and loss, fascinating to children and adults. Some are destroyed within the hour, some last a few days, but only a few have lasted as long as five years. *(© Charles Simonds)*



95 *Eureka,* Lausanne, 1963–64. Jean Tinguely's fantastic machines celebrate the discarded object, and when set in motion, pointless activity, as well. *(© Monique Jacot)*

among them, and one little community cannibalized itself as it grew. Children were fascinated watching him work, and joined in building the villages. Later, they played with them, and then destroyed them—or perhaps fought to protect them. It was a fantasy of fragility and loss, bringing to the surface the feelings that local residents must have had about their own lives, in the grip of outside forces.

Jean Tinguely made self-destroying machines from material scavenged from the dump.[13] He brought dead things to life. "Scrap is beautiful," he said; it gives reality to abstract patterns. Old iron has a form peculiar to itself, and a meaning from its previous use. These old things are particularly powerful if they have personal associations; if they are baby carriages, for example, or the limbs of mannequins. He delighted in useless, playful machines, revolted against tidiness and efficiency. He was especially fond of 19th-century machinery, for its patina of use, its ornamentation—which is the superfluous mark of caring—and its open way of operating. Electronics did not interest him, since the workings cannot be seen. Con-

sumer excesses, on the other hand, made him uneasy, and he installed machines in department store windows that visibly destroyed the goods for sale within. In one window, he created a bottle-smashing machine, for example, complete with an elderly Chinese who swept up the recurrent mess. "Stop building cathedrals and pyramids, which are doomed to fall to ruin," he urged. " . . . The only conceivable stability is life, development, movement." Like Smithson, he also referred to the mystical notion of stillness within rushing turbulence.

We can only reply that cathedrals also change in time, and that their ruins, too, are lovely. Were they built with that in mind, both building and ruin might be richer still. If electronics works invisibly, and its devices are bereft of the forms of human care, then we must make the function visible, and give it the form of care.

Webs of Wasting

We continue to search for ways of distancing ourselves from our wastes. Sewage outlets extend further out to sea, chimneys higher in the air. At the same time, we mine our materials from what once were unattainable sinks. We can dredge up the nodules on the sea floor for their nickel, copper and cobalt. The remainder will be rejected: another wasting problem. We reach deeper into the earth for other minerals, and some day no doubt for its internal heat. Towing polar icebergs to the tropics has been proposed, and mining the moon has been dreamed of. The sinks and sources are both receding, and so we are responsible for more and more extended and interwoven webs of wasting.

Learning to Waste

There are many technical and economic problems to be faced in dealing openly with wasting and decline, but the commanding difficulties are in our minds. Obsessed with purity and permanence, we must learn to waste away, learn to see the continuities in the flux, the trajectories and the unfoldings. These traces give us a present hold on the past and the future, as unmoving, unmixed things do not. We live today, and not even so recently as the 19th century. Effervescent or glacial, everything changes. Life is growth and decline, transformation and elimination. We might learn to take pleasure in that to maintain our continuity.

APPENDIX A

Talking About Waste

PEOPLE HAVE DEEP FEELINGS about waste, and these feelings affect the ways they deal with it.[1] Twenty-one leisurely interviews about waste were conducted in the spring and summer of 1981 to obtain a better understanding of common feelings and practices.[2] The interviews wound about a range of topics: definitions, memories, daily practice, loss and abandonment, the nature of wasted life and wasted time, irretrievable waste, feelings about ruins, reuse, the sight of destruction, and so on.[3] At one point, six photographs of aspects of waste were presented for comment. Instead of maintaining a forbidding neutral silence, the interviewer at times discussed his own experiences and feelings, but in such a way as not to lead nor obscure the comments elicited. The order and wording of the interview varied, since the discussion was allowed to follow a natural course. But the same material was covered in each case.[4]

This is not a representative sample, but it is an interesting group. They are young adults, male and female, for the most part middle-class and with young children. They live in two places: on the north (or "wrong") side of Beacon Hill, a now-gentrifying area that was once the haunt of the working class and the impoverished student, which has the typical problems of inner-city waste disposal; and in the inner suburb of Newton, a relatively affluent and "progressive" community, which has been engaged in various experiments in the recycling of household waste. These informants were chosen through a chain of acquaintance, and for their willingness to undertake a long interview. Undoubtedly, this group of 21 has a greater awareness and interest in the subject than most. Our aim was to uncover some current attitudes that might stimulate our own thought, and not to make a statistically significant survey. The interviews were conducted at home, subject to all those annoying, and at times revealing,

interruptions of children, callers, and background noises.

Expecting to be queried about standard subjects such as toxic waste and recycling, our informants were surprised at the breadth of the discussion, and at the end many volunteered that it had made them think about subjects that they had not been conscious of before. In our turn, we were surprised at their ability to deal with new subjects and to bring up hidden feelings. The questions, being rather abstract and conceptual, ran the risk of evoking banality and bewilderment. On occasion they did, but for the most part, they were a rich source of images and emotions. At any rate, the talks are a pleasure to listen to, and, however wearisome, were a pleasure to conduct.

As the reader will see, there are some striking agreements here, and some equally striking divergences. To some extent, the divergences seem to be connected with class, or with the location of residence, but more often with deeper differences in worldview. The differences of class, in any case, are rather small, except perhaps in class origin (since many of these people are upwardly mobile professionals). The difference of response between Beacon Hill and Newton is concerned mostly with the differences in the public disposal systems, and with the effect of residential density.

There are some avoidances here, which speak of deeper feelings. Inconsistencies are to be expected since this is a conflicted subject, and our people were not given an opportunity to construct a smooth public face. In part, the replies are based on what they have been taught, whether by their parents or by the public media; in part, they spring from inner feelings and personal experience. We need not expect these to be consistent with each other. Waste is a difficult issue—to some people a desperate one, to others simply an annoying question that constantly threatens to obtrude and so must be kept under control. These interviews contain many long pauses and sinkings of the voice.

Meaning of Waste

The interview begins easily enough, with asking what first comes to mind at the mention of the word *waste*. Almost everyone replies with some material they personally and frequently dispose of: garbage and trash, for the most part, but also dead laboratory rabbits or, with an apologetic laugh, shit and bowel movements. When asked to fill out a longer list of wastes, they enumerate a long list of things thrown away—primarily either things

they must deal with, such as garbage, shit, diapers, paper, bottles and cans, trash and litter, or substances they may know only indirectly, but which seem threatening to them, such as toxic chemicals or nuclear waste. A few, however, go on to list some inefficiencies, such as lost time or energy at home or in the office, or bring up some general critiques of society, such as the waste of resources, excess consumption, or big autos.

Their first definition of waste, then, (which later is often modified or implicitly denied), is that waste is some by-product of production or consumption, which has no value and therefore must be disposed of. It is material whose merit is extinguished for good, and which must be gotten out of the way, and for all time. Trash is trash forever: "all that yuck." A few respond that waste is inefficiency, an unnecessary loss or squandering, an opportunity lost. It is a happening, rather than a thing. As one remarks, waste is both a noun and a verb. In both cases, waste is a material or action produced by human beings; it is not natural. "I would rather be poisoned by maggots than by benzoate." (The recurrent appeal to natural processes as the standard of excellence is almost touching.) Waste involves human choices, conscious or unconscious. One respondent notes that volcanic ash makes good soil, and that floods are necessary. Another, turning the distinction inside out, says that waste that affects people is the only significant kind. "People before bugs and bunnies," she remarks. "If a raccoon has to walk through it, that's O.K." (The new animus against the raccoon appears in several places, along with the usual dislikes for ants, roaches, and "bugs." What was an exotic and therefore disarming creature in my childhood—furry, fastidious, and cruelly hunted—has lately become a formidable urban scavenger.)

Many of these definitions break up, as the discussion continues. A small band admits early to the difficulty of definition, since the word covers a number of ideas. One person made the remark that the term is not only slippery but also powerful: that words create as well as describe, and so the negative connotations of the term are spread over many different phenomena. "We define new wastes, as well as make new ones," says another. But it is surely a pejorative term. One person thinks of a junk car lot, because her friend was blinded by an explosion there. Another thinks of disease, and "disease-carrying

bugs." Still another immediate image is of the continuous stress of disposing of the garbage of a summer camp for 200 children, isolated on a small island.

Death and burial came up several times. "Burying someone in a casket is a waste both of the body and the casket." Another describes how she was "sucked into" buying a mahogany casket and a concrete liner for her father. On the other hand, she has very uncertain feelings about whether it is right to cremate the body, or donate it for research. Waste also seemed to be associated with control. Thus its occurrence is both a mark of our affluence, and of our loss of collective control. To lose something is less wasteful than to be stolen from, since the latter is a notorious loss of control. But no, says another, waste occurs when something falls out of use. If something is stolen it is not a waste but a redistribution, since it is still in use. At any rate, no one speaks up for waste.

The Worst Wastes

Next, they were asked what was the worst kind of waste. No one had any difficulty with that, although they might want to name several candidates. For the most part, they now shift away from their own immediate experience of garbage and trash, which they agree are annoying but controllable events, not life-threatening. In general, they nominate two worst cases: the waste of human capabilities, on the one hand (however difficult that may be to define), and, on the other, those contaminations that pose long-term threats to human society, such as nuclear waste, toxic chemicals, or the pollution of groundwater. The latter class of objects is fairly definite in their minds, although only one or two have had any experience with them. They seem far beyond personal control, and indeed beyond social control. The attitude is pessimistic and passive. Or, if not passive (since several have been involved in some effort to avert pollution), then at least pessimistic.

On the waste of ability, they speak of "inferior education that wastes children," of wasted minds, talent, and creativity, of "the many who are lost, and don't know it," of the waste of resources in government employment. One goes beyond that to point to the waste of nonhuman species (she works with Greenpeace): "People always think about wasting things and not beings! Eating meat is wasting life." As we will see, however, it is not easy to explain what is meant by the waste of life, however strongly felt.

Some few, in describing the worst waste, stick to their personal experience, identifying things that are particularly disgusting to them. Dog shit on the streets is mentioned twice, since it may be tracked into the house, or children may play with it. Another mentions the dead laboratory rabbits and aborted babies she has seen in the hospital. The smell of waste products is particularly offensive, even more than the sight, and one respondent makes conscious note of that. "It stinks" is a recurrent descriptor.

Good Waste

After these decisive answers, they were asked if there were any harmless, or even good, kinds of waste. Here the trains of thought were derailed. There were long pauses, hesitant denials or admissions of possibility, as they reassessed their images. Waste is not normally defined as good. Thus a substantial number could think of no harmless wastes. Those who could do so mentioned compost, manure, and recycled garbage or paper. They frequently appealed to nature, citing the forest ecology, the use of compost in a garden ("but we don't do it, because it would attract ants and animals"), or even the recent plague of gypsy moths, which had looked terrible, but in the end fertilized the ground. One mentioned sweat, which cools the body, and rids it of toxins. A few thought of "waste time" that they used for recuperation. But this was a puzzling question for many.

Childhood Memories

At first, the next question also produced few responses, or rather vague ones. This puzzled us, since we had expected it to evoke reminiscences. We had asked if they had any vivid childhood memories about waste. For my own part, I can remember many things: leaf-burning, and the narrow space behind the garage that was choked with decayed leaves; city smoke and dust, and my first encounter with the manure of a farm; the dismay of bedwetting, and the strain of containing myself when I could find no public toilet; my investigation of the toilet mechanism, which was my first understanding of the workings of a machine; playing in vacant, rubbish-strewn lots; my first wake; the empty framework of a tall apartment building whose construction was abandoned during the depression; a dead dog in an alley; and many more. But our respondents would pause, search their memories, and say no, they couldn't remember anything special.

It wasn't prudery that held them back, or an actual lack of memories, but something else. They had been expect-

ing an interview about the public waste disposal system, and our first questions had confirmed that expectation. As they then thought back, they could remember very little of how garbage or trash was actually disposed of when they were young (and neither can I). They might remember emptying the wastebaskets on collection day, or carrying out the trash cans, but these were hardly important memories. As children, they had been outside the disposal system, not involved in it, hardly aware of it. One remarked that he could not recall the garbagemen, another that "when I was a kid, the garbage didn't smell." "The toilet paper was always there. We saw only the flowers, never the stems." What they did remember was that it was their parents, who had grown up in the Depression, who were concerned about waste. Not-wasting was a parental admonition. They remember the words "don't waste," and being reprimanded for wasting something. One even remembers his father pronouncing the contrary slogan: "when in doubt, throw it out." Typically, it seems, mother and father would hold divergent views. One would be a saver, perhaps an obsessive one, the other a dumper. But that was a parental affair, and waste was only a vivid moral word.

Later in the interview, as the subject broadened, the memories emerged that we had expected at the beginning. One person recalls the burning of leaves, another the collection of returnable bottles to earn money for penny candy. A woman has the vivid memory of being taken out of bed, while a small girl in the country, to see the raccoons raiding the garbage. One father was adept at fixing old appliances; another built cars out of parts from junkyards. One family's home was full of papers, which represented academic work in progress, and their mother used to say: "learn to edit your house." One respondent remembers seeing the sewage outfalls, which were exposed on the bed of the ocean at very low tide. Another used to play in the trash dumps amid huge pipes, which he now thinks must have been extremely dangerous. We discovered images of street sweepers, and a childhood aspiration to become a garbageman and run with the big trucks. One man says that he is not uncomfortable with bodily wastes because he was a bed-wetter as a child (not that that was a pleasant experience for the child, however). One woman kept dairy cows as a teenager, and collected and used their manure. But except

for this latter example, these are memories of personal observation, or of parental attitudes, rather than a childhood participation in the wasting process. For the most part, these children stood outside of it, just as they stood outside of the process of production.

History of Wasting

Thus, when they are asked whether wasting was different in their parents' day, the answers are rather general and conventional (although not therefore untrue). Their parents had less waste to deal with, they say, and certainly far less packaging—paper, plastics, and other wrappings. More of it was biodegradable; more of it was recycled, in the form of returnable bottles, repaired clothes and appliances, metals collected in wartime, and newspapers tied up for the Boy Scouts to gather in. There was less extravagance, more saving; goods were more durable. At the same time, their parents may have had fewer means for coping with waste: no plastic bags, more primitive public collection, unattended dumps, and so on. The paper bags broke, and garbage spilled on the ground. They had fewer means to prevent their refuse from looking and smelling like what it was. "Our society now has less stomach for its waste than it did in the past. It is more easily disgusted."

So too with their own children. "They don't think about it," these new parents say. "They are oblivious to litter," and tolerant of blight. For them, "waste just disappears." Yet they are reported to dislike organic odors, such as of farts or manure. One small child breaks in to declare that she doesn't like waste, and then goes on to relate what fun they had at school recently, scouring the school grounds for aluminum cans at 35 cents a pound. They found a goldmine of cans under the bleachers. A woman whose mother-in-law is wealthy reports on the wasteful attitudes of her husband's children. The ancient domestic struggle between order and disorder continues in the background of many of these tapes. The vacuum cleaner roars. One hears: "*You* clean up the room," "She just made a mess on the floor," "Daddy, you have to clean this up," or, from parent to child: "Yes, that's *your* job!"

On the other hand, there are reports of how the children like to play with trash. "Picking up junk starts around six. It's very common." Moreover, and this may be a new phenomenon, the schools and the media have begun to take notice of the subject. "Our two-year-old loves trash. After all, Oscar the Grouch [a character on the children's

television program "Sesame Street"] lives in a trash can." "Creative kids find use for trash." In the Newton schools, the children make objects out of cans and old paper-towel rolls more frequently as school funding is cut back. "My children are more aware than I was." They mean to instruct their children not to waste—but by example, one is careful to add, so that they won't reject the admonition in principle. "She *definitely* doesn't break things, except for eggs."

Future of Waste

When asked what they think the waste problem will be for their children when they grow up, the answers are as insubstantial and emotional as prophecy usually is. The tone is almost unrelievedly gloomy. One person thinks that technology is catching up with the problem, and another says that it will get bad enough to force a positive response, but the others see grim times coming. The brightest response is that the children will simply have more to deal with—more paper, more plastics, more pollution—or that it will be much the same for the next 20 to 30 years, until the swelling world population and dwindling resources catch up with us. Otherwise, they are frightened and pessimistic. "I *don't* think. We may blow ourselves up. Whatever it is, it is coming fast." "Bleak. A cliche but I mean it." "A coming scarcity of space and goods." "Our waste is leading us to an authoritarian society. It alarms me." "As society progresses, our garbage piles get bigger." "Scary. The destruction of the world." "*Real* environmentalists should kill themselves." About acid rain, people just say: "A few fish in the lake." "Western civilization is depressing." "One part of optimism is the knowledge of how bad things are." However removed from present experience these forebodings may be, or attributable to other concerns, or evoked by the media—however inaccurate they may be as predictions—they are the pervasive dark backgrounds of the discussion.

Recent Waste Experiences

From this black future, we turned back to the sun and shadow of the present. What kinds of waste do they regularly deal with themselves? What problems do they have with it? What did they throw away yesterday, for example? Well, they threw out food, paper, junk mail, newspapers, containers, and wrappings. Above all, they resent the incessant *packaging* of things. "We shop at Star because it *doesn't* wrap food." Paper bags and advertisements and junk mail mean a waste of trees, and plastics a waste of oil. A graphic designer is acutely conscious of

paper waste, but all of them feel it and must live with it. The city of Newton used to pick up all kinds of paper for recycling, but has given up all but bundled newspaper as impractical.

The plastic garbage bag brings out an interesting ambiguity. People feel some guilt about using it, and one respondent says she dislikes putting mixed garbage in these bags because she knows that the plastic won't decay. Nevertheless people use it and are appreciative of its convenience. It is a "necessary evil." It makes the control of garbage easier; there are fewer spills on the street. It saves time and energy; no scrubbing of the pail is needed. Besides, "they will make it whether I use it or not," and "Anyway, other people use it, so why shouldn't I?" (the two classic excuses). It is interesting that they do not connect the garbage bag with the multiple wrappings of the market that they so dislike. Both are packagings that help to control the transmission of the product (food or garbage), at whatever resource cost, or whatever the cost to the next in the chain (consumer or recycler). But still, they are uneasy. The image of the chaos inside the wrapping is distasteful, and two mention the bagging of fallen leaves as especially "ridiculous" or "bizarre."

Being young parents, they have diapers on their minds. Most of them use "disposable" paper diapers, but, like the plastic garbage bag, these objects are guilt-evoking. "Cloth diapers are better but . . . When I think of that stinky pail upstairs—even the knowledge that it is sitting there . . . and when I think of them all mashed up in the truck!" Another uses paper diapers only at night, and cloth during the day, to avoid the labor of washing sheets, pad, and mattress cover. Yet "it makes me sick that others use disposable diapers all the time." No one washes their own family's diapers any more, and the handling of a child's excretions is an unpleasant aspect of parenthood. It would be unthinkable to allow the child to go about without pants, although this is common enough in other societies.

Garbage, trash, paper, junk mail, packaging, and diapers are the material wastes with which these 21 young adults are most concerned. But other things are mentioned: rocks from the backyard, which one man used to take by the bushel load to the dumpster at his work; dog shit in the street, bottles and cans, sand from the sandbox, broken plaster, leaves, caterpillar waste. Some

of them are savers: "I used to save bottles until the cellar was full, and felt guilty when I threw them out." Others collect for a time, and then periodically clean out the accumulation. Some are "editors," and enjoy the purgative act: "I look forward to moving, so I can throw stuff away." Others have more difficulty with it: "It was mental effort to throw things out when we moved, but the purge was good."

Scavenging

Some are not ashamed to scavenge among the discards on the street, looking for building parts, appliances, or other interesting objects. Others feel it doesn't look good, or that what they pick up might be contaminated. "Once it is out of a house, who wants to pick over garbage? I've thought of it, but who knows who had it before?" One recalls that he was a "dump picker" when he lived in Maine and had the outdoor space to store his finds. He got "good stuff" that way, and, having been trained in archaeology, found the dump very interesting. Another found many useful tools and appliances in his day, but does less picking now because his time is more valuable. Several refer to the "lost art of dumping," as they recall the social role of a rural dump that they may have explored. The role of available space for the storage and recycling of waste is often alluded to, and it is evidenced in the different attitudes of Newtonians and Hillpeople toward dealing with interruptions in the disposal process.

The scars of battles internal and external to the home are evident. "I am always picking up things and putting them back." "The kids dump everything into the sink." "If we leave anything on the street, the dogs and raccoons will shred it." One is engaged in defending the alley next to her house from other dumpers. One projects her feelings onto others: "People won't clean up the street because it's beneath their status. 'I wouldn't *touch* that,' they say." "I don't pick up someone else's trash. I take care of my own." One man complains that other people won't accept responsibility for problems of waste. Soon after that remark, he says that it is up to the building management to take care of his garbage, once he puts it in the chute. "Out of sight, out of thought," says another.

Waste is an annoyance, and it's lucky that others will manage it. "We must deal with waste, but we mustn't ruin our lives doing it." "Having a coke is worth dealing with the empty can." "There is waste in overworrying." Still, they admire those who recycle. "Some people use

everything, garbage on the flower beds, soup from potato peels. Too much bother for me. It depends on the value of time." They explain the difficulties of recycling, the schedules, separations, deliveries, and bundling up that are required. "We used to cycle bags, but the store won't take them any more. It's frustrating; we spend all our time coping. We don't flush the toilet often; there's a real drought coming." She takes three-second showers, and fights with her husband, who takes longer ones. But there are creative responses as well. One woman disposed of her old washing machine by letting the neighborhood children come in and take it apart as a game. Once dismembered, it was easier to discard.

A few mention other kinds of waste that are part of their daily existence. Wasted time is frequently brought up, and often this refers to the time in front of the TV set. There are references to the wastes produced by automobiles. One is an indirect allusion in the form of an apology: "I use the car. I can't plan my day around the 'T' [referring to the Boston transit system]."

Waste Collection

What do these citizens think about the public collection service in their area? In general, considering what it has to cope with, they think it is pretty good: good, very good, fine, a blessing, good but noisy, outstanding but people don't give a damn. This is spiced with the occasional bad, dreadful, or "it varies." "They fling the pails into the truck, leave garbage in the street, drop cans everywhere." Interestingly enough, the only consistent complaints come from Newton, which had instituted an elaborate recycling system and then had drawn back from it. The Newtonians grouse about the things the town no longer will take, and about the complex schedules that govern the remaining collections of glass and newspapers. "The schedule is a bitch." "We were disappointed when they dropped the composting area." "Recycling is a pain: the schedules, the separations, the noise." "It becomes a game—what they will leave and what they will take, what day they collect."

Then what are the garbagemen like?[5] The answer is almost unanimous: they are friendly, obliging, helpful, "regular guys," nice, efficient, energetic, "unsung heroes." Many of the respondents know them by sight, and make a point of greeting them. It is significant that the only disagreement here crops up in the form of imagining how the garbagemen themselves must feel. One person as-

sumes that they must hate their jobs; another that they must hate people, and that other people treat them badly. Indeed, we depend on the collectors. They do what we assume must be an unpleasant job. We are very grateful, relieved that they will take it over, and just a little fearful that they might quit. It's nice to see them take over, like the man from the bomb disposal squad.

When asked what they would do if the waste collection service should fail, however, the Newtonians seemed to take it in their stride. Why, they would take it to the dump themselves, or to the incinerator in Wellesley; they would burn it, compost it, put it in the woods, or store it in the barn in back. They would also organize to put pressure on the politicians (not the garbagemen), since they know the local effectiveness of a loud, well-placed voice. The Hillpeople have no space to fall back on, at home or in their community: "My neighbors have no backyards, no fireplaces to burn trash in. They can only dispose of liquids." So they would organize, or hire someone, or try to produce less of it. But they are more inclined to trust in the system: "*They* would make other arrangements." One would ask for the national guard; another would move out. In general, however, both groups would find some method of dealing with the problem, whether individually or collectively. It would be unpleasant, but not a catastrophe. They have had such experiences before.

Valuable Wastes

It took more thought to answer the next question, and stronger feelings surfaced: "What was the last thing you had to give up that had some value for you?" Not everyone could think of something immediately, and a few gave guarded answers. Eventually there was an extensive list: a washing machine, a set of crystal glasses, clothes that went out of fashion. Children's clothes are quickly outgrown, and one respondent started a children's secondhand clothing store. "We hand down clothes until they are rags," says one, "but you shouldn't wear someone else's shoes." "Throwing away outgrown shoes is the worst; there is so much wear left." Many of the items they mention represent their children's stages of growth: art work, school products, or apparel. This is painful editing—"the kids will never be that age again"—and saving something from each age is one way of coping, creating what one called a "Museum of Loved Objects."

One man tells of discarding a wool suit, "a nice grey pinstripe that I bought when I came back after living for

two years in shorts and a T-shirt." It was difficult to discard, and he conducted a mental ceremony of leave-taking. A woman confesses, "I just threw out the top of my grandmother's wedding cake. ["Mommy!" says the shocked child who is listening in.] It had been 50 years in the basement, and was all rotten. But I saved the statue on top." Another speaks of her outrage when a set of baptism cups were stolen. One recalls how difficult it was to discard some old chairs, which were still usable and had meaning, since they had been used in several dwellings. A man sees a waste decision in the future when he must nerve himself to reject a rusty car.

Getting Rid of Things

Our respondents are led by these memories and forebodings to talk of how they get rid of things. Some hold on to everything as long as possible, others until things are quite worthless and no "marginal decision" is necessary. Others put them to "mature" in the basement, where eventually they are either thrown out or repaired. In the same vein, one speaks of keeping a "pile of junk" and discarding from the bottom. These strategies require storage space, and there lies one of the advantages of the ample single-family house.[6] In contrast, one woman likes to get rid of things, and to keep starting from scratch. Nor are members of the same family always in agreement. One man had thrown out the box a new fan had come in. His child had wanted the box, but he had gotten sick of seeing it lie about the house, and, since the child was not there that day, had just now disposed of it. A woman who had undergone psychoanalysis said that for her, "analysis was a way of saying goodbye to things." We had hoped to learn more about how people managed the loss of things. For the most part, however, we learned more about basic feelings than about sequence or strategy.

Sense of Loss

Although we had asked people about the *things* they had had to give up, the discussion often turned to other losses. One remembered his anger at the loss of his marriage, another her pain at leaving her dairy cattle when her family had to move. For her, the loss of material objects was of little importance, and even the loss of other people, sad as it might be, was not a permanent loss. "You can't go through adult life without it. You recover." Another regretted leaving England. They had sold their house in London to go to the Caribbean. "I did it to myself, but, looking back, it was a rash thing to do. I feel the sense of loss now." One man spoke of his deliberate

efforts to break off emotional ties and ways of life—to shed his family past when he entered college, and then to forgo the "mental exercises" of his colleges days after graduation. Afterward, he realized the waste. Giving up things was much easier.

So they were already answering our next question: "Have you ever abandoned a person, place, building, or thing that was particularly important to you?" A few avoided a direct response, but most spoke with great feeling. There were fewer references to things now, except as the symbols of other attachments, although one respondent thought of losing her "bear Freddie, at age 11, when we moved. It was sad; he was such a nice old patched thing." And another said, "I'm not that attached to place. Things, yes. I still have my bear." But the great majority spoke of people or places, or the two together. Two lamented the loss of old buildings in Boston, on Beacon Hill and in South Boston, and mentioned the Boston Opera House and the old New England Aquarium. One remembers the difficulty of leaving school, another her father's death. One responds, "I recently learned that the daughter of a friend is seriously ill. I'm not deeply affected by the loss of things." Then, in a moment, as she thinks about it: "But I was in Gloucestershire when I was young. You don't know it? It is a soft gentle English landscape. I saw it disappear. It breaks my heart." One man is stirred to speak of leaving Willimantic, where he grew up, because there were no jobs there; and of how he has seen the loss of the rich farmland of the Connecticut Valley.

One remembers giving up Cleveland, when he changed jobs; another his sadness at leaving Washington, "It was a good time then." A third thinks of leaving Micronesia after two years. "It was an incredible cultural experience. I made many friends. We kept in touch for a while, but it's sad—I'll never go back." Another reminisces about a house in Concord, New Hampshire, where he lived for a year. "I used to walk down to the river, to see the herons and the cows." He left because his marriage ended, and because there was no work. "I left the garden, left the sense of living together. The loss of the building was a symbol of that other loss." Yes, replies one woman, we feel the loss "when others leave Boston. You make an investment in friendship."

One recounts a different memory. When her parents died, she went back to London, to take charge of her six-

year-old sister. But the old house was her parents' house, and she had to get out of it. It was full of ghosts. It felt good to leave, she said, but she cried all the way back to Boston. Another remarks that a move is an opportunity to change, to shake something off. Clearly, these are people who are familiar with the pains and rewards of mobility. They have some strategies for dealing with it: keeping in touch by telephone or visiting, saving a few pictures or souvenirs, or talking about it as a release for emotion. But they know about losing jobs, friends, places, marriages. Mostly, they just live with it, and with their memories. It is easier to say goodbye to people or places, or things, says one, if there are replacements for them.

Eternal Loss

"Once wasted, is a thing lost forever?" That was too general, indeed too misleading, a question. Many simply ignored it. Some said yes, or no, or yes and no. A few reflections were made: that time is lost, while things persist; that "energy is lost forever. But I can't visualize 'lost forever.'" "Nothing ever disappears. Everything returns." "Unfortunately, things are *not* lost forever. They pile up." "There should be a way to reuse everything. I love how the Irish dig up squares of soil and use them for heat." For the most part, however, these remarks lie at a distance from their own experience.

Declining Areas

The answers become more concrete, though, when we asked what came to mind at the words "declining area"; whether they had ever lived in one, and what their feelings were about it. "Declining area" brought to mind two distinct images. One was the decaying, low-income inner-city zone represented by Roxbury or Blue Hill Avenue in Boston, or by that pure archetype, the South Bronx in New York. The other, quite opposite, was of some rural area of childhood, now lost to urban development. The former evokes a sense of fear and decay, the latter a sense of nostalgia for something gone. Both images are very powerful. One woman, as a teenager, had organized a cooperative to save the farms in her area, which were being squeezed out by high taxes and low returns. But she had lost; the farms were eventually given over to housing. In a city, she thought, decline might bring people together.

For most people the inner-city image is a very familiar one, whether or not they have ever lived in such a place. It is dirty, wasted, decaying, crime-ridden, racially torn, prone to fires, failed, broken in spirit. The trash and dirt

are a symbol of that failure—"a veneer of disregard." "People throw things on the ground like children" [but not like *her* children!]. The symbolism of dirt operates in their own lives: "When I think least of myself, the apartment gets dirtier, I take less care of my own appearance. When criminals say 'I don't give a shit,' they are not happy with themselves."

A surprising number of these middle-class people have lived in such areas—occasionally in childhood, but more often as young adults attending school, or when they were "pioneer" families in gentrifying neighborhoods. For the most part, they lived there because it was cheaper, and because it was close to school or to work. A few liked the neighborhood for its diversity of people, its excitement, or its community spirit. There was "less hassle," or "you could get unusual things there." One felt quite at home in that setting and had no sense of danger. Now she is frightened, living in the country, "where others are far away, and the dogs are howling." Inner-city living was a "rich experience" (at least in retrospect) and "healthy because *real.*"

None of these people lives in such a place any more—although the back side of Beacon Hill might once have been so classified. Most of them remember that it was depressing to live there, although it might have been important for them to get some sense of that life. "Until you see what it means to live in an unclean place, you don't know how lucky you are." "Life was more of a struggle there"; "I had to pick my way through it"; "when I lived there I was very sad, but I can't separate my psyche from the state of my surroundings." "You only live there if you are a superliberal and it soothes your guilt. If you know about it, you don't have to be punished." "A declining area is really a mixed area, which doesn't work well when bringing up children." "Yes, I lived in one, but didn't know it at the time. It was a safe Jewish area. Now it is *filthy,* but it has character." ". . . parts of Washington, burned out in the riots. It was a shock to see, since I grew up in that city."

Ruins

The next question dealt with their perception of ruins and abandoned places. Their answers cannot be disentangled from those to a later question about the reuse of old buildings, so we discuss them together. First, they make a sharp distinction between a ruin and an abandoned place. The first is something old, romantic, and

disconnected from their own lives. These people have done a great deal of travelling, and their responses speak of Ireland, Greece, Italy, Mexico, France, Israel, Ponape, or the ancient pueblos of New Mexico. Almost the only location cited that is near in time and space is a Shaker village in western Massachusetts.

They are fascinated by these places, and try to imagine how ancient people lived in them. They do not connect them with their ideas of waste. The passage of time has burned away the discomfort; the remoteness in space and time drains them of any emotion but curiosity. Our respondents all speak of their pleased interest in these remains. Of Teotihuacan, Mitla, and Monte Albán: "Very spiritual. *Tremendous* structures! All the records were destroyed by the Spaniards, but the pieces remain . . . the powerful sense of driving through ruins as yet undiscovered." "I respond strongly to ruins. History is before 1648. By the time they are old, ruins are clean." "They are good because they have lasted, they have survived. But now they are trampled by tourists." Then he thinks of the shallow ruts worn in the steps of MIT's main entrance: "how many feet!"

Ruins mean a lost civilization; they are exciting. "When at a ruin, I try to picture what that life was like." "Ruins are pleasant; they take you back." "I have a friend who lives near a Shaker village, who writes poems imagining the community. There are signs all through the woods—the second growth, the fences, the foundations." Another mentions the sense of human continuity that he felt on seeing the old pueblos of New Mexico, and of his archaeological interest in the forms that people chose to live in. "A ruin has no sense of waste." "Good ruins last thousands of years. Instead of ruins they should be called perseverances." So these remains are attractive places to visit, and quite different from recently abandoned places.

Not everyone shared this perception. One woman was taken to Pompeii when she was five years old, and saw the casts of the bodies overwhelmed in that disaster. "I was shocked. It was an awful destruction. Once people lived there. The perspective remains. Abandonment is the same for me: the absence of people." "When I visit ruins, I think of the numbers of people involved in building them, and those who died in the process." "We are *taught* that ruins are beautiful, and the South Bronx is not. The latter is an abandonment that could have been other-

wise. We see what is not there—an indictment of our time, something we should change but are impotent to accomplish. The Parthenon would not be as impressive if next to it there were another one still functioning." "I visited the ruins of Ponape—channels made by an ancient civilization. It was curious, but I wouldn't want to stay. No place to go if I had a cold." One man even recounted a visit to a contemporary ruin: "The kids and I went out to the New Hampshire housing development where the F-111 crashed." The children picked up some toys in the wreckage, and it was like a party. "But no one died in it," he explained. Another broke into the old German consulate in the West End, abandoned 50 years before, and was fascinated by the gas lights, and the records of old dinners. Emotional distance is the key to the definition of a ruin.

As for abandoned places more recent and closer to home, feelings are uneasy and unpleasant. One commented: "Abandonment is an ending. It is not exciting, but sad. It means *dead*." Another: "Closed buildings are depressing, especially schools." "I go by an abandoned building as quickly as possible." Of bombed London: "It was death too close. I imagined the bombs coming down. People died in them." "Abandonment is something discarded. Ugh, *death*." A woman who visited a poor area of London called the Bottoms, in pursuit of her interest in folk music said, "The people were dying, the children few, the shacks decaying. Life was a ruin, the spark was gone." But she felt that when everyone was dead and gone, the Bottoms would not be a depressing place. Another spoke of abandoned buildings in the South Bronx: "A feeling of something sick. It's crazy seeing the apartments in cross-section—toilets, mirrors, people once doing things, all sliced in half!" Of a church gutted by fire: "How long it took to make, and what little left in so short a time! An incredible work of art gone." "It's interesting but sad. Abandoned articles in office buildings are more depressing than those in homes. Ledgers—a life of doing mindless work, which is the supreme waste." "Abandonment is an indictment, a symbol of a lack of control, a lack of care, a broken spirit."

Reuse

Nevertheless, some see in abandoned places the possibility of renewal. "Three deckers in Roxbury—it's like after the gypsy moths. Now there are new gardens in the open spaces. There's an up side. After the bomb in

Hiroshima, there was an explosion of flowers! The seeds were invigorated by the radiation." [Do we witness here the creation of a new myth?] "I'm frightened at the absence of people, but fascinated with the architecture." "The old is better built. It has more architectural interest." "Any new building is shit" [this from an architect!]. "The old stuff has incredible character." "I like to get my hands on old buildings and fix them up. There's always hope."

Indeed, quite a few of these people, in Newton as well as on Beacon Hill, have in one way or another had some involvement in the rehabilitation of old structures. Without exception they approve of it. Their only reservations have to do with the cost, or with the distortion of original character. "Fabulous! I'm personally committed to making good buildings out of old. Not discarding them, making them alive again." "I love renovating. It's what I want to do when I grow up!" "The most rewarding thing in my life was recycling an old house, preserving its quality for someone else to live in." "It's really good. The change of Boston's direction is the best thing that happened." "The old train stops in Newton are H.H. Richardson. They're terrific reused, but it's an expensive indulgence." "It's phenomenal how they have restored the New London railroad station." "Wonderful!" "It's rewarding, professionally and emotionally." "The new building on top of the Massachusetts Eye and Ear is terrific." The old Museum of Natural History, remodeled as the chic Bonwit Teller store, is cited as beautiful. "When I design my dream house, it's going to have a lot of that" [referring to the sense of proportion and "mellowness" of a Greek Revival house where he once lived in Roxbury]. One man, engaged for years in rebuilding his own house on Beacon Hill, points with satisfaction to its old beams, which date from the 17th century, and which were taken in 1825 from an earlier house to be reused in this house. The idea of recycling buildings has become like a new religion, or at least an act of faith.

It may be a costly faith, however. One man cites Quincy Market as dollars spent in the wrong place: they should have been spent in Roxbury. A builder, engaged in recycling, says: "The waste in construction is frightening. When we gut a 15-story building, the material that comes out is staggering." He cites the waste of 2,000 usable light fixtures, whose new wholesale value might be $50 each but whose scrap value is so low that it does not pay to

truck them to a dealer in Salem who could take them. "So we junk them, because they don't fit the systems in the renovated building." "The economy doesn't follow our culture," says another, "It has no care for the earth."

There is also some ambivalence about what the recycling produces. "I have a good feeling about recycling, but at times it is incongruous." In regard to the Faneuil Hall–Quincy Market renewal, an example frequently named by the interviewer to stimulate discussion, the verdict is generally favorable, yet mixed. People enjoy the activity, the life it brings to downtown, the old buildings preserved. Most of them visit it occasionally, or take visitors there. But: "It's not ours anymore. I liked it before. Now it's superficial, all shops and boutiques. Still, you can't return to the 19th century." "I like Quincy. It brings people to the city. But it's sad to lose the old market function, and see Haymarket displaced." "It's all white middle-class, but at least there are *people* there, and it's safe." At any rate, it is a potent symbol of the pleasures and problems of reuse. Indeed, says the builder, "Everyone recycles buildings. Throwing away a building is a big step."

Destruction

"Have you ever stopped to watch something being destroyed?" Indeed they had. They were fascinated by seeing the destruction of a building and yet disturbed by it. "I *love* it [in an elated tone] . . . except when I know the building." One tells of his fascination at watching the wrecking of a garage behind the Jordan Marsh department store, and several commented on the thrill of watching the dynamiting of the old Atlantic City hotels on TV: "thrilling until I thought of what replaced those hotels." "It's fascinating to see a building opened up: walls with their paint from different floors—like a doll's house." "I'm fascinated with razing. The iron ball is dispassionate, but the rubble reminds me of World War II: Dresden, London. A clean city, sunny, the wind blowing." Later she remembers her childhood interest in the incinerator: "the great iron doors, the enormous fire"; and the machines in the dump: "big backhoes, everything disappears." But then she thinks of what leaches into the streams, and how it pollutes the air.

They all enjoy destruction, and most have second thoughts. "It's marvelous to watch the buildings implode; it's as good as the Fourth." They are impressed by the precision, the energy. "Got a lot that time!" "Do it again! . . . A childish feeling." "How long to build, how quick to

come down!" Several had already told us of their distress at suddenly noticing that some familiar building had disappeared in their absence. Their solid daily background had shifted. But: "buildings going up and down are both exciting." "I was glad to see the old Trailways bus station go down. It was a bad station." One man had been a demolition contractor. "I loved it. It was filthy, disgusting, and a release. I have some mental conflict in seeing buildings go down, but I'm fascinated by the ball. I just supervise now, but I still feel like getting dirty." Clearly, demolition is a powerful event.

"Have *you* ever destroyed something for the fun of it?" Here the answers were more ambiguous and guarded. No, but I have friends who do, was a frequent reply. "Just recently I smashed a bottle. It felt good. I never had before; I'm very controlled. I looked first to see if anyone was near." "I threw a cream pitcher across the room, but that was in anger, not in fun. I don't understand the impulse to break things." "Yes," said the contractor, "I enjoy knocking it down, when you blast away everything but the frame. On other jobs, you have to be more careful." "I'm never that out of control." "I had a job once, hitting cars with a sledge, and I loved it." "I kill roaches and the gypsy moths . . . the munching, the shit raining down! [The moths] are an artificial species [!], and I hate them." One remembers periods of gratuitous destruction in college—parties where they threw bottles down the stairs. A listening child volunteers that she tears up stuffed animals. Someone else remembers that she threw a pot at her husband, and that it was a release. Another: "I don't destroy for fun directly, but subtly, when I break something by carelessness." "It's a source of satisfaction at times," says one. For many, it is a guilty pleasure.

Images of Waste

Then we presented six photographs for discussion, one at a time, in random order. One picture showed a small piece of barren ground, its setting framed out, on which lay a disordered array of large dark discarded cylinders (they were old truck bodies that had been used for transporting asphalt). In the background, there is a waste collection truck labelled "Incinerator Authority," and in the foreground a scattering of trash. In the midst of all this, there is a prominent sign: "No Dumping Allowed—Police Dept." The reactions to this familiar scene were much of a piece: displeasure, disapproval, cynicism about the sign,

and a feeling of hopelessness. The truck bodies, although they puzzled most respondents, were a metaphor for chemical pollution. The "no dumping" sign in the midst of the trash was all too pat; it said that things were, as usual, out of control. But the symbolism was a little worn. Since most viewers assumed that this dump was far from places where people lived or worked, it seemed less threatening. "Disgraceful; it doesn't have to be." "The sins of the 20th century. Don't see how to undo it." "It's not as bad as the rest, since it's not where people live." "Chemicals and children dying." "What do we do with this stuff? It's depressing. What's the answer?" "It makes me sick. Chemical pollution is here for hundreds of years. We have no control, once it happens." "Stupid signs. It makes one think, 'A little more garbage here won't hurt.'" "This is very common. The period of strong reaction is over. We have seen too much to be affected." "Like the remains from a war." "Toxic waste! All that stuff's going to get you."

Another photograph was more dramatic. It showed a heavily littered city street lined with old walk-up apartments. The sidewalk is so heaped with trash and garbage as to be almost blocked, and a man is picking his way through. There is an abandoned, wrecked car at the curb, and a fire truck in the traffic lane. The respondents react with disgust, but also with curiosity as to what has caused it. Is it a riot, a fire, or what? It must be an unusual event, or perhaps it is staged. In contrast to the previous photo, this scene is clearly in a residential area, and therefore worse. On the other hand, it is the sort of thing that *can* be dealt with. "Unbelievable. Why aren't the trucks on duty?" "Yuck! More disturbing than the dump, because people live around it. We can control this, but we don't." "Makes you feel inept. But it's not hard to solve." "A riot? a garbage strike? I'd hate to live here, day after day." "Will it be removed? But Haymarket is like this on a Saturday." They are curious to know where the picture was taken, and many guess (rightly) that it must be New York. "That's New York. I love New York!" It's all very unpleasant, but it does not present the basic problem.

A third photograph showed a large, indistinct factory, its chimneys and vents pouring forth smoke and steam that obscure the scene. There are some small sheds and levelled piles of earth or other waste material in the foreground, but these are barely visible. The reaction to this

scene is rapid and visceral. "My sinuses are clogging; I can smell it!" "I don't want to breathe!" "I'll hold my breath." "The sight is OK; it's the health and the smell." "Glad I'm not up there!" "Stop poisoning my children!" "Acid rain—goodbye Grand Canyon!" "Why stop smoking, if this is in the air?" "At first, I thought of a concentration camp." Along with the fear, there is also a persistent sense of helplessness. "You can't fight it." "It's out of my control." "It makes me angry. But you can't just stop producing stuff." "I don't know what they can do about this." "The ultimate externality." It also evokes comments on how values have changed. "When I was a kid, I was thrilled by factory smoke. The country was at work, it was the frontier mentality." "There was a man in Los Angeles, years ago, a cartoonist for Disney, who wrote protest letters about factory smoke. They thought he was crazy. He was branded."

Still another photograph showed some municipal trash collectors at work. Five men, all suited up, are picking up cans, bags, and cardboard boxes, and dumping them into the rear end of a compactor truck, whose rear wheels are backed up onto the sidewalk. The cans, boxes, and bags are all neatly tied or covered. The comments are neutral, if mildly approving. They focus on the work situation—apparently New York—and compare it with Boston. "Good. They're doing what they're supposed to do." "It makes me feel good." "Doing their job." "Lots of men! That's the answer." "Featherbedding—too many men. But systematic and professional." "Professional looking: gloves, caps, uniforms. Stalwart souls!" "Sure are lots of men!" "The Protestant work ethic. It sure is neat, clean garbage!" "Overstaffed, but good teamwork. You don't see that in Boston." "The cans aren't dented!" "It's not Boston." "It looks posed."

A fifth photograph shows two frame houses being torn down. Their roofs, additions, and part of their walls are gone. These were large Victorian clapboard houses set on reasonably ample grounds. One man is breaking down a wall with a wrecking bar; another in the background is throwing some sheet material down to the ground from a second story. The ground is heaped with broken lumber, among which there are such objects as a bathtub, a tire, and a wheel. There is a separate pile of old pipe and other metal, and dust is in the air. Somewhat to our surprise, several respondents were not sure whether this

was construction or demolition. "Is it going up or down?" "I'm not sure what's going on. I'd feel better if it were a building being renovated, not razed." Although most did recognize it for what it was, their feelings were quite mixed, or suspended until they knew more about the context. Much depended on what the houses had been, why they had to come down, and what would replace them. "A shame. What happened, did it burn?" "They should be putting it up." "Rehabilitation or coming down, it's a community trying to deal with its problems." "To me, renovation; to others, it may be a tearing down." "Why?" "Disgusting." "No reaction, since I don't know why it's happening." "I assume some nice stuff is going up in its place?" "On the up side, there is too little open space, and maybe this will be so used." "Indiscriminate tearing down!" "I hope they saved the good parts." "Look, a bathtub!" There is some regret, and some dislike of the momentary disorder. But everything depends on what's coming next.

The sixth picture showed five young black boys playing in a trash-strewn back alley: running, sitting on an old wheel, throwing a ball. In the foreground are the springs and stuffings of a gutted sofa. In the background, there is a yard full of assorted trash, a shed whose roof has collapsed, some weedy trees, and, quite indistinct, the worn rear facades of two-story wooden buildings. The first step was to establish the context: "Rural poor. I associate it with the South." "Poverty." [A word heard many times.] "Typical ghetto. Could be anywhere." "A refugee camp?" "A shantytown?" Then people comment on it as a place to play. For most it seems intriguing, if dangerous. At times the scene evokes their own memories. "Dangerous. It could be altered to be fun, but this is not a place to play." "I wouldn't want to play there, but the kids make it less bleak." "Fascinating. They're exploring. It's unsafe. It reminds me of when I was a kid." "I used to play ball in stuff like this, but I had a choice. Do they?" "I used to play in junk. Some of the best times I had." "*Not* a place to play. If we lived here, we would change it." "Typical boys' play. There's an element of danger, but they're finding some wonderful treasure." "Vermont sculpture! I used to play in the same." "Depressing. I never played so." "Looks rural. Looks like fun." "Are they busy destroying things?" "This isn't here, so it's not my problem. It's what happens when there's not enough space. It

doesn't look like garbage, so it's not dangerous." "It appeals on one level, and is obnoxious on another. Society says don't play here; street sense says yes." They feel the tension between their own experiences as children, and their norms as parents. There is certainly a thrill here, despite their dislike for trash and poverty. This is fun for boys, incidentally, and not for girls—a perception that the photograph reinforces. There are underlying references to race, and to the fact that the boys may be more dangerous than the waste.

Is Waste Inevitable?

We concluded the interview by asking a series of rather general questions. For the most part, they added little that was new, since the answers had been implicit in all that came before. For example, we asked if what is waste for one could be useful to another, and if there was a difference between retrievable and irretrievable waste. Yes, yes, we had gone through that before. A few additional examples were given: "If I have some newspapers, and want to paint a room, they are no longer waste. When we moved in, we resurrected stuff that had been left in the basement. Once we picked up a sled that had been thrown out. It still had the sticker from a yard sale." These were familiar ideas, although one person insisted that no waste could be retrievable, since waste was irretrievable by definition.

Was waste avoidable, or was it a fact of life? It's unpleasant but unavoidable, they say, but we could control it better. "It would be nice to have less waste in our lives, but it's inevitable." It's a fact of life; it's part of the cycle. Still, "we couldn't live if we had to think about it all the time." As for better ways to manage it, two general ideas emerge: "return the substances to earth conditions"; and "people should look at whole systems." "Much waste is unnecessary, because we deal only with local solutions." Yet a somber sense pervades these discussions. The respondents feel themselves capable of controlling the waste in their own territory, but they lose hope when they look at the global flow.

When asked if things are getting better or worse worldwide, they reiterate their sense of impending doom. "Getting worse. Enough! We'll be a desert!" "Worse. Chemicals, higher cancer rates. We will have to deal with it forever." [Is the human species eternal?] The really dangerous wastes are all those new chemical and nuclear substances that persist and disrupt the natural cycle.

Waste of Things, Lives, and Time

One of these final questions set off substantial further thought and debate. "What is the difference between a wasted thing, a wasted life, and wasted time?" Everyone had something to say on this, but there were long pauses while they tried to put their ideas in order. Wasted things were clear, but what was wasted time? One person said there was no difference between the two: "waste is waste." Another person (clearly a doer) replied: "That's unimportant [a long pause]. To dwell on it is a waste. There's so much communication, so much repetition." But all the others puzzled over why we used the same word for two such different things. "Time and things . . . [a long pause, while the clock ticks in the background] . . . I'm concerned with wasted time . . . [then to a child who interrupts] This is *my* time and space. I didn't invite you." "Waste time is unclear. How do we know it wasn't well spent?" "What is wasted time? You judge by the product." "Waste time may be wasteful in terms of work, but not for the person." "Much 'wasted' time is really a sense of guilt for what we are doing then." "Just sitting around isn't waste time. Waste time is watching TV—mass-produced passive enjoyment." "The work I do is intangible. I never know whether I am wasting time or not. At the moment it may seem waste, but not on looking back." "Everybody thinks they are wasting time, but no—they are recharging." "I had to fight the closing of a school. It should not have been necessary, but it was. So the time was a waste." "When my husband quit work for six months, some called it a waste. But he needed the time off." "It's wrong to divide days between waste and order." "College can be wasteful, in an economic sense." "Waste time is a sense of guilt that we are supposed to be productive." Waste time is good and bad; it exists and it doesn't. As they say, it involves a sense of guilt, and a discrepancy between our external and internal perceptions of time, which confuses our concept of it.

Most of our respondents feel impelled to compare the value of wasted time and things. Here they seem to fall into two camps. One says: "Waste time is worse, it's lost forever. A beautiful day is gone. We can always replace things." "It takes two hours to fix a thing, and 15 minutes to replace it. I'd rather go dancing." "Time is the most meaningful waste. It can't be reversed like things." "Time waste is worse—the opportunities lost." "Time is more precious." And the other camp replies: "There's lots of

time, so it is less of a waste than things, except when there is a limited time in which to do something." "A waste thing is worse than a waste time. The thing remains to bother others. Time vanishes." "Waste time is personal, an indulgence. Waste things affect others." "Waste time affects fewer people; there is less residual impact." (A daughter interrupts, "*You* waste tape, every time you pause," and the mother replies, "But the pauses are significant.") The "disappearance" of time, and the stubborn persistence of matter, have opposite values for these two sides.

Some respondents point out that there are other kinds of waste, as well. An architect mentions the wasted space of grand planning, and cites City Hall Plaza; "Things could happen in it. It's dead because our culture's dead." Another notes: "Here is an extreme interpretation of your topic: using unconscious energies for repression. How much better it is when you're not so engaged!" The definition of waste has broadened out.

Most puzzling of all, and perhaps most profound, is the idea of a "wasted life." Is there such a thing, and how can it be identified? "There cannot be a wasted life. It's an offensive idea. Even a single smile may be useful to another person." "I would be arrogant if I thought I could identify a wasted life, although it happens. I've never regretted my own, though I have lost opportunities." "A wasted life is different from waste time or things, it's the most extreme. But how do you define it, unless someone is shot for no reason?" "A wasted life is not a valid idea, though I admit I haven't seen the worst. I see winos on the street, and know they feel superior to me." Some respondents attempt the definition: "A wasted life is not doing anything to better yourself." "A waste life is marking time, bored with job and family." "A not-wasted life is a matter of productivity, not of income, but a feeling about what one is doing, enjoying it, a sense of making a contribution." "Researchers who experiment on dogs waste the dog's life and their own" [from a woman active in antivivisection work]. "A wasted life is an old man who feels he never accomplished anything, or a teenager in the street with an empty future. Not wasting is living a conscious work of art—that's Nietzsche. The waste is apparent when one is faced with one's own mortality." A wasted life is also a matter of individual responsibility: "If you waste your life, it's your own fault, it doesn't affect

others. It's totally under a person's control." "A wasted life involves choice, some free will. A wasted thing is imposed on others." Not only is the individual free to waste his life or not, but its waste is likely to have little effect on others! But most respondents react to the idea of wasted lives with due caution and respect.

Summary

At the end, our discussants express their interest, their curiosity as to how the interviews will be used, and their surprise at the breadth of the questions. They say that it made them think. They cannot suggest further topics that should have been covered in our discussion; we must have encompassed the field. In that, of course, they must surely be mistaken.

There can be no doubt that this was a special group, relatively articulate and quite interested in the subject. Their feelings cannot represent the view of an average citizen, if such exists. Yet many of these thoughts must have echoes in our culture—at least they stimulate us to consider some common issues. It is interesting, for example, to see the kinds of wastes that are common in their lives—food, paper, junk mail, packagings, diapers, and time—and how they cope with them and feel about them. They are all unpleasant concepts, subliminal irritants. They forget such things when they can, and deal with them as they must. Although capable of coping on their own, they leave the wasting to others if possible, being relieved by, and a little anxious about, the regular disposal system. Handling garbage may be viewed as unpleasant, low class, or even dangerous, but rarely interesting. There are interesting ambiguities about some of these waste objects: the plastic garbage bag, for example—a packaging for waste analagous to the packaging of goods that they despise, but calculated to hide and to display (like the function of clothes to conceal and to reveal). Or the paper diaper, which so disgusts them, since our way of toilet training is based on blocking a body function.

Beyond their own area of work and residence, there are hidden and uncontrollable dangers: polluting substances that pour forth and accumulate irreversibly, the sinful acts of our civilization. Our respondents are themselves reasonably comfortable and secure, but have deep fears about the future, and for their children. "Nature" and "waste" are powerful metaphors of good and evil. Yet they are quite intolerant of organic wastes: shit, blood, decayed food, and animal smells. The words of waste are

strong magic, and they bridge over, and color, quite diverse phenomena.

The diverse styles of keeping and losing are instructive: the savers, the dumpers, and the "editors"; those who deal with wasting as a continuous flow, and those who act spasmodically. The availability of space is a factor in this, and differences in style are often a matter of contention within the family. Saying goodbye has its pleasures, but it is a difficult thing for most. They speak of the pain of loss, and have relatively few ways of managing it. They delight in destroying things, but know that breaking is usually followed by regret. They are fascinated by the spectacle of demolition, but often disheartened by its aftermath. They sharply distinguish between ruins and abandoned places; the distancing of history allows them to enjoy what is otherwise a symbol of despair. The recycling of the environment is almost a religious cause for them, although they have some reservations about the authenticity of the result, and about the cost. Here, as in attitudes toward saving things, there is a distinction between those who believe in preservation, and those who enjoy a continuous flow. The "wasting" of time puzzles them, and the waste of a life is profound and mysterious. The relations, and the relative values, of these and all the other concepts that are bridged by that same word, are quite unclear.

Viewed as an accurate poll this is garbage, but for us, it was a rich banquet of perceptions.

Waste and Loss Interview

Interviewer: We're interested in learning how people feel about waste.

1. When I said "waste," what first came to your mind?
   Could you name some different kinds of waste?
   How would you define waste?
2. What is the worst kind of waste? Why do you think that is so?
3. Do you have any strong or vivid childhood memories regarding waste?
   How do you now react to that situation?
4. Back to the present, what kinds of waste do you regularly have to deal with?
   What problems do you have with it?
   I'm curious, what did you throw away yesterday?
   How did you throw it away?
5. If the regular collection wasn't working on your street, what would you do with your trash and garbage?
   What do you think of the present municipal collection?
   What are the garbagemen like?
6. Did your parents have different kinds or amounts of waste to cope with?
   In what ways did they cope that are different?
   How do you think it will be for your children?
   Do your children have different ideas about waste than you do?
7. What was the last thing you had to give up that had some value or meaning to you?
   Why did you throw it away/give it up?
   How did you do so?
   What were your feelings at that point?
8. Have you ever abandoned a person, place, building, or thing that was particularly important to you? (probe for more than one type of loss)

How did that feel?
Was there anything that you could have done at that time to ease the loss?

9. Do you feel that once something is wasted it is lost forever?

10. When I say "a declining area," what places come to your mind?
Have you ever lived in one?
How did you feel about it then?
What were your worst problems there?
Were there any advantages?

11. Have you ever visited a ruin or abandoned or declining place?
What were your feelings?

12. Have you ever stopped to watch something being destroyed?
Again, what were your feelings at the time?
Have you ever destroyed something for the fun of it?

13. Have you ever been to a building or place which has been abandoned and then recycled for a different use?
How do you feel about this sort of thing?

14. Here are a few photographs. What are your responses to each?

15. Do you think that what is waste or wasteful for one person can be valuable to another?
Do you differentiate between waste which is retrievable and that which is not?

16. Tell me, what is the difference between a wasted thing and a wasted life or wasted time.

17. What is the most serious problem of waste today?
Are things getting better or worse?

18. Do you think that waste can be avoided or is it a fact of life?
Do you have any ideas on how we can deal with it in a better way? (probe for individual vs. society methods)

19. Now that we're done, what do you think we are trying to find out?
What would you add to these questions?
Would you change any of them?

APPENDIX B

Notes on Editorial Methodology

THE WORKING MANUSCRIPT for this book consisted of a handwritten and typed original that was then extensively edited by Lynch, including numerous handwritten insertions, deletions, and reorganizations of text. It was evident from the alterations that he had revised the original manuscript at least twice, probably more. Two chapters (5 and 6) were originally handwritten, edited, then typed and edited at least twice more. It is quite possible that all of the chapters were originally handwritten and the originals then discarded. Soon after his death the manuscript was typed by Anne Washington Simunovich, his former secretary at MIT, to create a legible working copy. In addition to the manuscript itself, the Lynch family provided me with all of the research materials he had used in working on the book. These consisted of several files of handwritten notes, periodical and newspaper articles, reports, illustrations, and bibliographic references that had been assembled over a period of at least 25 years.

There were many problems with the manuscript that made it unpublishable as it stood. The text had several gaps that he intended to fill in later; these primarily required checking of facts or updating of information. Parts of the text were repetitive, other sections were unclear, and several sections lacked continuity. The sequence of chapters had not been settled, nor had the title. Neither the bibliography nor the bibliographic citations had been prepared by him. His notes suggest that he intended to use a large number of illustrations in the book and had begun a file of possibilities, but none of the illustrations had been selected.

Although the manuscript had many problems that needed attention before publication, I felt that the book contained many important ideas and should be published.

Many others who read the manuscript had similar feelings. It was a topic that he obviously had deep interest in and had spent years thinking and writing about it.

My approach to editing the manuscript has been to minimize alterations of the original text except when needed for the sake of clarity, completeness, accuracy, or continuity. When in doubt, I made no changes. In several cases where the text called for updating, this was done. Wherever possible, I have cited sources; in 2 or 3 instances this was difficult. While it was often tempting to disagree with, improve, or "correct" his ideas, I have tried to avoid injecting my own opinions.

The title *Wasting Away* appears on his March 1984 outline. However, a page in the research notes lists two alternate titles: *On Wasting* and *About Wasting*. These were considered too bland and noncommittal and lacked the force of *Wasting Away*. Although he had not settled on a final title, *Wasting Away* was the title he used in discussing the book with friends and family. For some people this title seemed strong, but too negative, and did not suggest the positive message of the book. Thus, *Wasting Well*, also the title of the last chapter, was considered for a time, but some readers found the meaning of this confusing, interpreting "well" as a noun rather than adverb. Moreover, the Lynch family felt strongly that the title should be *Wasting Away*. Thus, the title stands.

The structure of the manuscript seemed particularly problematic. As he left it, the book had 9 chapters. A handwritten outline dated March 1984, the month before his death, listed the chapter order as follows:

1. The Dark Side of Change
2. Fantasies
3. The Waste of Things
4. The Waste of Place
5. Talking About It
6. Looking At It
7. Morbid and Dirty Thoughts
8. Wasting and Wastefulness

?9. Flying Back and Forth

? Transformations?

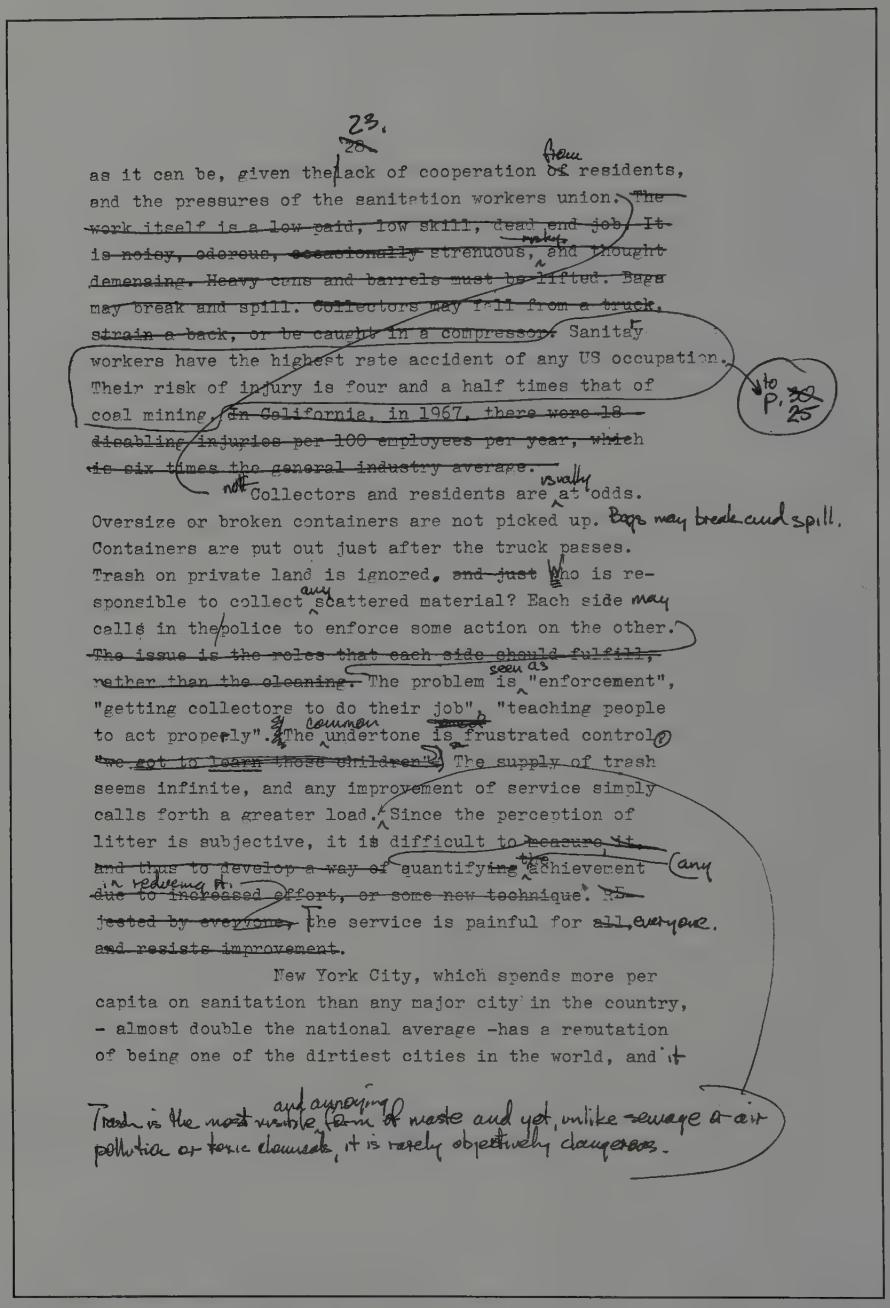
WASTING AWAY

✔ 1. The Dark Side of Change
✔ 2. Fantasies
✔ 3. The Waste of Things
✔ 4. The Waste of Place
5. Talking About It
* 6. Looking At It
✔ 7. Morbid and Duty Thoughts
8. Wasting and Wastefulness
? 9. Flying Backwards and Forwards.
? Transformations?

Mr/84

*to do.

96 Outline



97 Typical manuscript page

It should be noted that this order does not exactly conform with the manuscript as he left it, which was ordered as follows:

1. The Dark Side of Change
2. Fantasies
3. The Waste of Things
4. The Waste of Place
6. Morbid and Dirty Thoughts
7. Then What Is Waste?
8. Wasting Well

X. Talking About It

Most likely the March 1984 outline was his most recent thinking on the chapter order. However, the titles for Chapter 8, "Wasting and Wastefulness," and Chapter 9, "Flying Back and Forth," are not used in the manuscript and appear nowhere else in his notes. "Wasting and Wastefulness" was no doubt the chapter titled "Then What is Waste?" in the manuscript. However, it is not at all clear whether "Flying Back and Forth" was an alternate title for "Wasting Well" or a completely different chapter that he never wrote. And was "Transformations" still another alternate title for "Wasting Well"? There are no clues in the research files or in the manuscript. I have chosen to use the chapter titles found in the manuscript, which seem more vivid and to the point. The only chapter title alterations I made were the changes of "Talking About It" and "Looking At It" to "Talking About Waste" and "Looking At Waste," which seemed somewhat stronger and clearer.

Some changes have been made in the chapter order and organization for the sake of continuity and logic. "The Dark Side of Change" and "Fantasies" read more like prologues than chapters. Their style and content are quite unlike the other chapters. Some readers were disturbed by "Fantasies," especially when placed at the beginning of the book; others were fascinated by them but felt they needed to be placed in context. No other location in the book seemed appropriate for "Fantasies." The idea of making it an Epilogue was briefly considered, but it was

an unsatisfying ending for the book. Thus, a brief introduction was added to the chapter and it was made Part II of a two-part Prologue that begins with "The Dark Side of Change." The use of prologues or brief prologue-like introductions was quite consistent with some of Lynch's other books, e.g. *Good City Form* and *What Time Is This Place?*

Another organizational change was moving "Morbid and Dirty Thoughts" up to become the first chapter. This was done for two main reasons. First, the chapter raises most of the ideas that are developed elsewhere in the book and thus serves as a good introduction. I felt the book needed a strong introductory chapter to present Lynch's novel approach to a difficult subject. Second, "The Waste of Things," the chapter that originally occupied this position, is very focused on a particular type of wasting and contains a level of detail the reader is not prepared to accept at the beginning of the book.

A final organizational change is the placement of "Talking About Waste" in the Appendix. Although the chapter would logically be paired with "Looking At Waste," it is in fact a research report and reads much differently than the other chapters, thus breaking the flow. Some readers felt the material in the chapter was covered elsewhere in the book and that it seemed redundant. For these reasons it has been placed in the Appendix. This is consistent with Lynch's approach in *Image of the City* in which the survey and interview research upon which the book is based were placed in the Appendices. In Lynch's books the Appendices are often almost as important as the main text (see *Good City Form, Site Planning,* and *Managing the Sense of a Region*). In a sense they form parallel texts relating methodology, detailed discussions, or survey findings that would have weighed down the main text. Lynch always preferred to ground his ideas in empirical research in the form of field surveys or interviews. This was a way of both testing his intuitions and enriching his theory. His research was rarely, if ever, done with the scientific rigor demanded by environmental psychologists, yet with great economy of means and rather casual methodology (and perhaps a bit of luck?) he made discoveries that most later "scientific" researchers, at much greater expense of time and effort, have usually confirmed.

The text does not have a strong narrative or logical

flow. Rather, it reads more as a series of loosely linked essays on the themes of waste and wasting. However, the order does have a kind of logic. After discussing the problems of waste and wasting, it moves on to discuss waste processes and concludes with proposals for improving the way we deal with waste. The Prologue sets the stage for thinking about waste and all its ramifications. This is followed by "Morbid and Dirty Thoughts," an essay that hopefully stretches the reader's conceptions of waste and wasting. The next two chapters discuss in more depth the two types of waste that are the focus of the book, "The Waste of Things" and "The Waste of Place." "Looking at Waste" is an interlude that graphically depicts many forms of wasting and their environmental implications; it is a bridge between the first half of the book and the second half. "Then What Is Waste" attempts to define the subject drawing upon the preceding discussions. The book concludes with "Wasting Well" which contains concrete suggestions on how we might learn to acknowledge the necessity of wasting and how we could do it better.

Since each chapter covers many ideas, I have added subtitles (side titles, in this case) to help the reader find passages and follow the line of thinking. Although there were no subtitles in the original manuscript, most of Kevin Lynch's books utilize them; he most likely would have added them.

Text changes were made for varied reasons. Several passages needed updating to account for events since Lynch died, such as developments in the disposal of nuclear waste, more recent waste disasters, new uses for some wastes such as fetuses from miscarriages and abortions, or the amount of waste land in American cities. One example follows:

> *Chapter 2, p. 76:* "Investigations are now going forward in Carlsbad, New Mexico, but a proven safe place has yet to be found."

This was expanded to reflect more recent developments as follows:

> "The first planned disposal site for nuclear waste is now being constructed near Carlsbad, New Mexico, in slate deposits 2,000 feet below ground. Although EPA requires that such storage areas be safe for 10,000 years, plutonium has a half-life of 25,000

years. Will the salt deposits provide safe storage? Many scientists think not, because they may be subject to water infiltration."

The usual copyediting changes were made for consistency and correctness of usage, especially in punctuation and use of words such as "which" and "that." Occasionally sentence structure was altered for the sake of interest or simplicity, or for better continuity. Certain irregular usages were maintained that were part of Lynch's style and gave character to the writing. Some sentences, paragraphs, or sections were relocated to obtain better continuity. This was particularly necessary in "The Waste of Things" which had poor continuity in several sections. In a few instances text was compressed or cut to eliminate unnecessary repetition. A few pages of text had been removed from the original manuscript by Lynch for relocation elsewhere in the text; he had not done this yet, but had made notes about possible places to insert it. I examined the manuscript to find where they had originally been placed, then found places to insert the material in the edited version.

Some ambiguous passages were clarified. Several examples follow:

Chapter 2, p. 75: "All U.S. radwastes are presently in reasonably safe temporary storage, although there has been some leakage of liquids from steel storage tanks in Hanford, Washington."

It is doubtful that *all* radwastes are in safe storage, so the statement was changed to:

"Most U.S. radwastes are probably in reasonably safe temporary storage at the present time, although there has been some leakage of liquids from steel storage tanks in Hanford, Washington."

End of Chapter 2: "Nevertheless, we cannot throw anything away, since there no longer is an 'away.' At our level of experience, mass persists."

This statement was too dense to be understood by the average reader. Thus, it was changed as follows:

"Nevertheless, we cannot throw anything away, since there no longer is an 'away.' As far as we can tell from our experience to date, although materials may change in form, they cannot disappear."

Chapter 3, p. 109: "The destruction of Carthage was an unusual success (although the site is now recommended for a new town), but the attempt to obliterate Warsaw was an instructive failure. The German army was ordered to destroy the city forever; no usable fragment of Poland's capital was to remain. First, the remaining inhabitants were completely moved away. Section by section, the city was fired, to reduce its mass, and then blown up by demolition teams."

This passage, it was felt, did not sufficiently acknowledge the human suffering that was part of the destruction of the city. It was changed as follows:

"The destruction of Carthage was an unusual success (although the site is now recommended for a new town), but the attempt to obliterate Poland's capital after the Warsaw Uprising was an instructive failure. The German army was ordered to destroy the city forever; no usable fragment was to remain. First, those who had survived the Nazi atrocities were evacuated. Section by section, the city was fired, to reduce its mass, and then blown up by demolition teams."

Chapter 5, p. 159: "We need not prohibit all dangerous discharges; life is a risky business. Our concern will focus on situations where toxic wastes are accumulating, and in particular are accumulating irreversibly."

This passage seemed to diminish the value of human life and might be misinterpreted to support careless disposal of toxic wastes. Such could not have been Lynch's intentions, so the passage was changed as follows:

"We need not prohibit *all* dangerous discharges in order to avoid being put in a dead-end position; life is a risky business. But we must be concerned with situations where toxic wastes are accumulating, and in particular are accumulating irreversibly."

End, Chapter 6: "We can only reply that cathedrals also change in time, and that their ruins, too, are lovely. Were they built with that in mind, both building and ruin might be richer still. If electronics works invisibly, and its devices are bereft of the forms of

human care, then we must make the function visible, and give it the form of care. We live today, and not even so recently as the 19th century. Effervescent or glacial, everything changes. We can take pleasure in that, to maintain our continuity."

The concluding paragraph of the book seemed to combine too many ideas and did not reach a satisfying conclusion. At the same time, there were some brief passages from earlier in the chapter that supported the final statement. Thus, these were tied together to form a new final paragraph. Text from the original final paragraph was placed two paragraphs earlier. The revised conclusion reads:

"There are many technical and economic problems to be faced in dealing openly with wasting and decline, but the commanding difficulties are in our minds. Obsessed with purity and permanence, we must learn to waste away, learn to see the continuities in the flux, the trajectories and the unfoldings. These traces give us a present hold on the past and the future, as unmoving, unmixed things do not. We live today, and not even so recently as the 19th century. Effervescent or glacial, everything changes. Life is growth and decline, transformation and elimination. We might learn to take pleasure in that to maintain our continuity."

A major task in the editorial process was in locating references for quotations, data, events, and other specific information cited in the text. This was especially difficult since Lynch had not noted a single source. He read widely and integrated information from many sources in his writing. While most of the references have been located through careful reading of his notes and through library research, a few sources have not been found. These include the exact sources of the E.M. Forster and Anaïs Nin quotations (pp. 24–25) and the discussion of David Marvin (p. 33). The bibliography was assembled primarily from the numerous notes, articles, bibliographies, and reports contained in Lynch's research files for the book. Bibliographic references were included that had obviously been used by him in writing the book; others that were in the subject area but for which there was no evidence of use were not usually included in the bibliography.

While none of the final illustrations had been located by Lynch, he had collected photographs and clippings of pictures from newspapers and magazines. Few of these were usable but gave an idea of what he was aiming for. He had also made notes on illustration possibilities. In assembling the collection of photographs, I have attempted to illustrate the many aspects of waste that are discussed in the book. All of the captions, of course, are mine, but again, I have tried to relate to or expand upon points made in the text. The photo essay "Looking at Waste" was completely developed by me; Lynch had given it the title, "Looking at It," in his outline, but no work had been done on the essay.

The format chosen for the book's design with a wide margin for side titles and occasional small sketches or diagrams is one that Lynch favored and used in most of his books. He considered illustrations to be essential parts of his books and preferred to have them appear throughout the text rather than being concentrated in just one place. Fortunately, the publisher has been responsive to these ideas.

M.S.

Notes

Editor's Introduction

1. Three of these were co-authored or edited.
2. "The Openness of Open Space," in *The Arts of Environment*, ed. Gyorgy Kepes (NY: George Braziller, 1965), pp. 108–124.
3. (with Tunney Lee and Peter Droege), "What Will Happen to Us?" *Space and Society* (1985), pp. 86–97. "Coming Home: the Urban Environment After Nuclear War," *The Counterfeit Ark: Crisis Relocation for Nuclear War*, eds. Langley Keyes and J. Leaning (NY: Ballinger, 1984), pp. 272–284.

Prologue

1. Michel de Montaigne (1533–1592), *Essays of Montaigne*, trans. Charles Cotton (London: Navarre Society, 1923).
2. This introductory paragraph has been added by the editor to prepare the reader for the fantasies and to place them in the context of the book.
3. Paolo Soleri, visionary 20th-century architect and author of *Arcology: The City in the Image of Man* (Cambridge, MA: MIT Press, 1969).

Chapter One

(When not included in the notes, facts of publication will be found in the Bibliography beginning on p. 249)

1. Stephen Greenblatt, "Filthy Rites" and Matilda Coxe Stevenson, "The Zuni Indians: Their Mythology, Esoteric Fraternities, and Ceremonies."
2. Claude Lévi-Strauss, *Tristes Tropiques*.
3. Friedrich Engels, *The Condition of The Working Class in England*.

4. V.S. Naipaul, *An Area of Darkness.*
5. Merrill Folsom, "'But Is It Art?' Neighbors Ask, and Sculptor Says Indeed It Is," *New York Times,* 28 May 1964.
6. André Gide, *The Immoralist* (New York: Vintage Books, 1970).
7. The editor has been unable to locate the exact sources of these quotations and Lynch's files and personal library contain no clues.
8. George Orwell, *The Road to Wigan Pier.*
9. Wallace Stegner, "The Dump Ground."
10. Denis Wood, "Shadowed Spaces: In Defense of Indefensible Space."
11. William Henry Hudson, *Far Away and Long Ago: A Childhood in Argentina.*
12. It is curious that Lynch never mentions Freud in this work, nor was there any evidence of interest in Freud's theories in his research notes and papers for this book.
13. There are exceptions. According to V.S. Naipaul *(An Area of Darkness)* toilets are social centers in India. This is also true in the West in certain instances; the powder room or faculty restroom can be important settings for gossip and discussion.
14. Greenblatt, "Filthy Rites."
15. Naipaul, *An Area of Darkness.*
16. Maxine Hong Kingston, *Through the Black Curtain.*
17. Bruno Bettelheim, *A Home for the Heart.*
18. The editor has been unable to locate the source of this; Lynch's research files contain no information on David Marvin.
19. Lisl Goodman, *Death and the Creative Life: Conversations with Prominent Artists and Scientists.*

Chapter Two

1. This will be true if we continue to burn fuel at the present rate. But if that rate continues to increase, the doubling will occur by 2025.

2. Rhodes W. Fairbridge, "Shellfish-Eating Preceramic Indians in Coastal Brazil."

3. Kenneth Lasson, "The Garbage Man."

4. Black, R.J., A.J. Muhich, A.J. Klee, H.L. Hickman, Jr., and R.D. Vaughan. *The National Solid Wastes Survey: An Interim Report.*

5. Henry Mayhew, *London Labour and the London Poor: A Cyclopaedia of the Conditions and Earnings of Those That Will Work, Those That Cannot Work, and Those That Will Not Work.*

6. In 1979, 47 million tons of scrap steel were consumed in the United States (relative to 115 million tons of new steel produced), and 11 million tons of scrap were exported.

7. The editor has added this information on the use of fetal tissue.

8. Here in the margin of the original manuscript, in light pencil, Lynch wrote: "'The leafless desert of the mind; the waste of feelings unemployed' [Byron]." It is not clear what he intended to do with the quotation in the text.

9. Koji Taira, "Urban Poverty, Rag-Pickers, and the 'Ants' Villa in Tokyo."

10. Richard N. Farmer and Barry M. Richman, *Comparative Management and Economic Progress.*

11. Martin Pawley, *Building for Tomorrow: Putting Waste To Work.*

12. U.S. Energy Research and Development Administration, *Alternatives for Managing Wastes from Reactors and Post-Fission Operations in the LWR Fuel Cycle, 1976.*

13. Judith Miller, "On Warning Posterity About a Nuclear Tomb," *New York Times,* 25 November 1982.

14. *New York Times,* 21 December 1982.

15. William L. Rathje and Wilson W. Hughes, "The Garbage Project As a Non-reactive Approach: Garbage In . . . Garbage Out?"

Chapter Three

1. And Frankfurt has its "Monte Scherbelino" (literally, mountain of broken glass), made of war debris.
2. Donald G. McNeil, Jr., "Deserted Buildings Turn into Hills at Breezy Point, *New York Times,* 27 January 1979, p. 1.
3. "Design and Appearance—1 and 2," *Building Research Station Digest,* No. 45.
4. The early design guidelines for Sea Ranch specified ungalvanized nails so that the rusting nails would ensure streaking patterns on the wood siding.
5. Colin Ward, ed., *Vandalism.*
6. Philip G. Zimbardo, "A Field Experiment in Auto Shaping."
7. Mikhail Bakunin, *Oeuvres,* vol. 1, p. 288.
8. It should be noted that decentralization of the American city has been heavily subsidized by the federal government, especially by means of highway construction and backing of home mortgages.
9. *Report of the President's Commission for a National Agenda for the Eighties* (Washington, D.C.: U.S. Government Printing Office, 1980).
10. Edgar Rust, "Development without Growth: Lessons Derived from the U.S. Metropolitan Experience."
11. The old canals of Lowell, Massachusetts, built to power the textile mills, have now been recycled along with the mills and machinery to become the framework for an educational and historical park.
12. Fernand Braudel, *The Mediterranean and the Mediterranean World in the Age of Philip II.*
13. Jack Lessinger, "The Case for Scatteration—Some Reflections on the National Capital Region *Plan for the Year 2000.*"
14. Sheafe Satterthwaite, "Puckerbrush, Cellar Holes, Rubble: Observations on Abandonment in Vermont."
15. Tertius Chandler and Gerald Fox, *3000 Years of Urban Growth.*

16. By the end of World War II, about 90 percent of the historic buildings, three-quarters of all residential buildings, and one-third of the streets of Warsaw had been destroyed. Both old and new towns of Warsaw were reconstructed building by building and almost brick by brick. In the old town, the reconstruction program included not only all the churches, but also the burghers' houses, dating from the 15th to 17th centuries. The interiors were rebuilt according to the extant architectural plans and facades were restored on the basis of old photographs and drawings. The maze of old town streets and squares and public foci such as the Fukier wine-shop were carefully reconstructed. The Royal Road, lined by historic residences, churches, and monuments, representing diverse architectural and sculptural styles from the 16th to the 20th centuries, was rebuilt meticulously, along with the two royal residences, which have a very important place in people's memories. Juliusz W. Gomulicki, *Warsaw* (Warsaw: Arkady, 1967).

17. Richard Sidney Richmond Fitter, *London's Natural History.*

18. As a member of the planning team, Kevin Lynch did much to recycle Columbia Point into a livable place (renamed Harbor Point) in the early 1980s. See "A Community Revitalization Plan for Columbia Point," a planning report prepared by Carr/Lynch.

19. There are no references to this manual in Lynch's notes, and discussions with the Connecticut Historical Society and the Hartford Athenaeum have failed to locate the source. However, an anonymous pre-1638 paper, "Essay on the Ordering of Towns" (found among the papers of John Winthrop, governor of the Massachusetts Bay Colony 1630–1649) describes the ideal Puritan town plan. It consisted of 6 concentric circles set within a six-mile square. At the center was the meeting house, which was surrounded by successive rings of houses, common fields, livestock farms, and estates. Outside the fifth ring were the "swamps and rubbish waste grounds" which were to be owned but not occupied by the town. [See John R. Stilgoe, "The Puritan Townscape: Ideal and Reality," *Landscape*, vol. 20, no. 3, Spring 1976, pp. 3–7.]

Chapter Four

1. *India Today,* 31 May 1988, p. 85.
2. Merrill Folsom, "But Is It Art? Neighbors Ask, and Sculptor Says Indeed It Is," *New York Times,* 28 May 1964.

Chapter Five

1. Paul and Percival Goodman, *Communitas: Means of Livelihood and Ways of Life* (New York: Vintage Books, 1960, second edition).
2. Jorge Luis Borges, "The Library of Babel," in *Ficciones* (New York: Grove Press, 1962).
3. John Todd and Nancy Jack Todd, *The Village as Solar Ecology: Proceedings of the New Alchemy/Threshold Generic Design Conference.*
4. Dame Rose Macaulay, *Pleasure of Ruins.*
5. Wallace Stegner, "The Dump Ground."

Chapter Six

1. Martin H. Krieger, *"What's Wrong With Plastic Trees?" or Rationales for the Preservation of Natural Environments.*
2. Clifford A. Kaye studied the erosion of the Gay Head Cliffs in the 1950s and 1960s for the U.S. Geological Survey.
3. One example of an adapted parking garage may be found in Taipei where parking spaces are commonly leased by vendors for use as market stalls, thus turning the garage partly into a market place.
4. Twelve wild rabbits were imported to Australia from England in 1859 to seed down properties for trappers and hunters. They spread at the rate of 110 kilometers per year in New South Wales and had become a pest within 30 years.
5. Ellis Armstrong, ed., et al., "Solid Wastes," chapter 13, *History of Public Works in the United States, 1776–1976.*
6. François Marie Charles Fourier, *Design for Utopia: Selected Writings of Charles Fourier.*

7. Ellen Lentz, "Big Mountains of Rubble Are A Growing Thing," *New York Times,* 9 September 1970.
8. In "City Segments," *Design Quarterly,* November 1980.
9. Grace Glueck, "A Drive To Save Split Sculpture," *New York Times,* 14 March 1980.
10. John Elderfield, *Kurt Schwitters.*
11. Robert Smithson, "Entropy Made Visible."
12. *Charles Simonds.*
13. K.G. Pontus Hultén, *Jean Tinguely: Méta.*

Appendix A

1. This brief introductory passage was written by the editor.
2. The interviews were conducted by Arne Abramson, an M.I.T. student at the time.
3. See pages 231–232 for questionnaire.
4. The interviews were taped; the summaries and extracts included here were drawn from the conclusions of Arne Abramson, supplemented by a careful hearing and rehearing of the taped record.
5. It is surprising that Lynch never interviewed the garbagemen, considering the extent to which their lives are affected by waste.
6. It might have been revealing to compare size of people's dwellings with their waste attitudes and behavior. Those who live in larger houses might be expected to be "savers" while those in smaller houses might be compelled to discard.

Bibliography

This bibliography is based largely on the notes, articles, and papers in Kevin Lynch's research files for this book.

Armstrong, Ellis L., ed., Suellen M. Hoy and Michael C. Robinson, assoc. eds. *The History of Public Works in the United States 1776–1976.* Chicago: American Public Works Association, 1976.

Bakunin, Mikhail, *Oeuvres* (5 volumes). Paris: P.V. Stock, 1895–1911.

Baltimore. Department of Housing and Community Development. "Homesteading," April 1975.

_____. "Homesteading: the Second Year," April 1975.

Bettelheim, Bruno. *A Home for the Heart.* New York: Knopf, 1974.

Bever, Michael B. "Recycling in the Materials System." *Technology Review.* February 1977, pp. 23–31.

Black, R.J., A.J. Muhich, A.J. Klee, H.L. Hickman, Jr., and R.D. Vaughan. *The National Solid Wastes Survey: An Interim Report.* Cincinatti: U.S. Department of Health, Education, and Welfare, 1968.

Blake, Peter. *God's Own Junkyard: The Planned Deterioration of America's Landscape.* New York: Holt, Rinehart and Winston, 1964.

Boericke, Art, and Barry Shapiro. *Handmade Houses: The Natural Way to Build Houses.* New York: Delacorte Press, 1981.

Braudel, Fernand. *The Mediterranean and the Mediterranean World in the Age of Philip II.* Trans. Sian Reynolds. New York: Harper and Row, 1972–73.

Brunner, Dirk R., and Daniel J. Keller. *Sanitary Landfill: Design and Operation.* Washington, D.C.: U.S. Environmental Protection Agency, 1972.

Calvino, Italo. *Invisible Cities.* Trans. William Weaver. New York: Harcourt Brace, 1974.

Cashan, L., P. Stein, D. Wright. "Roses from Rubble: New Uses for Vacant Urban Land." *New York Affairs.* vol. 7, no. 2, (1982), pp. 89–96.

Chandler, Tertius, and Gerald Fox. *3000 Years of Urban Growth.* New York: Academic Press, 1974.

Citizens Advisory Committee on Environmental Quality. *Energy in Solid Waste: A Citizen Guide to Saving.* Washington, D.C.: 1974.

Citizens League of Baltimore. *Solid Waste Management in the Baltimore Region.* no. 1, May 1975.

Conn, W. David. *Factors Affecting Product Lifetime.* UCLA, School of Architecture (for NSF), August 1978.

Cowan, Peter. "Studies in the Growth, Change, and Aging of Buildings," *Transactions of the Bartlett Society.* vol. 1, London: Bartlett School of Architecture, University College, 1962–63.

"Design and Appearance—1 and 2," *Building Research Station Digest.* nos. 45, 46. London: Her Majesty's Stationery Office, 1964.

Dolgoff, Sam (ed. and trans.). *Bakunin on Anarchism.* Quebec: Black Rose Books, 1980.

Drake, C.L., and J.C. Maxwell. "Geodynamics: Where Are We and What Lies Ahead?" *Science.* vol. 213, 3 July 1981, pp. 15–22.

East, W. Gordon. "The Destruction of Cities in the Mediterranean Lands." J.L. Myres Memorial Lecture 6, Oxford University Press, 1971.

Elderfield, John. *Kurt Schwitters.* London: Thames and Hudson, 1985.

Engels, Friedrich. *The Condition of the Working Class in England.* Stanford, CA: Stanford University Press, 1958 (orig. 1844).

Fairbridge, Rhodes W. "Shellfish-Eating Preceramic Indians in Coastal Brazil." *Science.* 30 January 1976, vol. 191, no. 4225, pp. 353–56.

Farmer, Richard N. and Barry N. Richman. *Comparative Management and Economic Progress.* Homewood, IL: R.D. Irwin, 1965.

Fitter, Richard Sidney Richmond. *London's Natural History.* London: Collins, 1945.

Fourier, François Marie Charles. *Design for Utopia: Selected Writings of Charles Fourier with an Introduction by Charles Gide.* New Foreword by Frank E. Manuel. Trans. by Julia Franklin. New York: Schocken Books, 1971.

Fyfe, W.S. "The Environmental Crisis: Quantifying Geosphere Interactions." *Science.* 3 July 1981, vol. 213, pp. 105–10.

Gleser, G., B. Green, C. Winget. *Prolonged Psychosocial Effects of Disaster: A Study of Buffalo Creek.* New York: Academic Press, 1981.

Goodman, Lisl M. *Death and the Creative Life: Conversations with Prominent Artists and Scientists.* New York: Springer, 1981.

Great Britain. Ministry of Housing and Local Government. *New Life for Dead Lands: Derelict Lands Reclaimed.* London: Her Majesty's Stationery Office, 1963.

Greenblatt, Stephen. "Filthy Rites." *Daedalus.* Summer 1982, vol. 111, no. 3, pp. 1–16.

Hall, Peter. *Great Planning Disasters.* London: Weidenfeld and Nicolson, 1980.

Hanrahan, David. "Hazardous Wastes: Current Problems and Near-Term Solutions." *Technology Review.* vol. 82, no. 2, November 1979.

Harrison, Gail G., William L. Rathje, and Wilson W. Hughes. "Food Waste Behavior in an Urban Population." *Journal of Nutrition Education.* vol. 7, no. 1, January-March 1975.

Hartley, Dorothy. *Lost Country Life.* New York: Pantheon, 1979.

Harwood, Julius J. "Recycling the Junk Cars." *Technology Review.* February 1977, pp. 32–47.

Hayden, Dolores, and members of the People's Autobiography of Hackney, eds. "The Autobiography of Jack Welsh and Marie Kelly Welsh, 1903– ." *Working Lives: A People's Autobiography of Hackney.* London: Centerprise Publications, 1976–77.

Hayden, Dolores. *Seven American Utopias: The Architecture of Communitarian Socialism, 1790–1975.* Cambridge, MA: MIT Press, 1979.

Haywood, William. *Report to the Committee Upon Health of the Hon. the Commissioners of Sewers of the City of London, and the Libraries Thereof Upon the Supply of Water to the City of London.* London: Brewster and West, 1850.

Hudson, William Henry. *Far Away and Long Ago: A Childhood in Argentina, with a New Preface by Nicholas Shakespeare.* London: Eland Books, 1982.

Hultén, K.G. Pontus. *Jean Tinguely: Méta.* Boston: New York Graphic Society, 1975.

Jackson, J.B. *The Necessity for Ruins: and Other Topics.* Amherst: University of Massachusetts Press, 1980.

Kearns, K.C. "Inner Urban Squatters in Western Industrialized Society: A London Case Study." *Ekistics,* vol. 46, no. 275, March/April 1979.

Kingston, Maxine Hong. *Through the Black Curtain.* Berkeley: Friends of the Bancroft Library, University of California, 1987.

Krieger, Martin. *"What's Wrong with Plastic Trees?" or Rationales for the Preservation of Natural Environments.* Working Paper no. 152. Berkeley: Institute for Urban and Regional Development, University of California, May 1971.

Lasson, Kenneth. "The Garbage Man." *The Workers: Portraits of Nine American Jobholders.* Prepared by Ralph Nader's Center for Study of Responsive Law. New York: Grossman, 1971.

Le Gaspillage. *Revue 2000.* No. 29. Paris: Delegation à l'Aménagement du Territoire et à l'Action Regionale, France, 1974.

Lessinger, Jack. "The Case for Scatteration—Some Reflections on the National Capital Region *Plan for the Year 2000." Journal of the American Institute of Planners.* vol. 28, no. 3, August 1962.

Lesser, Stephen U. "The Problems of Cleaning Up Uncontrolled Hazardous Waste Sites." Washington, D.C.: Clement Associates, n.d.

Lévi-Strauss, Claude. *Tristes Tropiques.* Trans. J. and D. Weightman. New York: Atheneum, 1974.

Lowe, Robert A. *Energy Recovery from Waste: Solid Waste as Supplementary Fuel in Power Plant Boilers.* Washington, D.C.: U.S. Environmental Protection Agency, 1973.

Lynch, Kevin. "Environmental Adaptability." *American Institute of Planners Journal.* Spring 1958.

Macaulay, Dame Rose. *Pleasure of Ruins.* London: Thames and Hudson, 1966.

Managing Mature Cities: Conference Proceedings. Cincinatti: Charles F. Kettering Foundation, 1977.

Mayhew, Henry. *London Labour and the London Poor: A Cyclopaedia of the Conditions and Earnings of Those That Will Work, Those That Cannot Work, and Those That Will Not Work.* London: G. Newbold, 1851.

Maynard, William S., Stanley M. Nealey, John A. Hebert, and Michael K. Lindell. *Public Values Associated with Nuclear Waste Disposal.* Batelle Memorial Institute, June 1976.

Melosi, Martin V. *Garbage in the Cities: Refuse, Reform, and the Environment, 1880–1980.* College Station, TX: Texas A & M University Press, 1982.

_____. "Battling Pollution in the Progressive Era." *Landscape.* vol. 26, no. 3, 1982, pp. 35–41.

Morgan, D.J. "Residential Housing Abandonment in the United States: The Effects on Those Who Remain." *Environment and Planning A.* vol. 12, 1980, pp. 1343–1356.

Naipaul, V.S. *An Area of Darkness.* New York: Macmillan, 1965.

Northam, Ray M. "Vacant Urban Land in the American City," *Land Economics.* vol. 47, 1971, pp. 345–55.

Nutt, B. "Failure Planning," *Architectural Digest.* vol. 40, September 1970, pp. 469–71.

Orwell, George. *The Road to Wigan Pier.* New York: Harcourt Brace, 1958.

_____. "How the Poor Die." *The Collected Essays, Journalism and Letters of George Orwell: In Front of Your Nose, 1945–50.* vol. IV. Sonia Orwell and Ian Angus, eds. London: Secker and Warburg, 1968.

OSTI. *An Analysis of the Refuse Collection System of the City of Boston.* February 1970.

Pawley, Martin. *Garbage Housing.* London: Architectural Press, 1975.

_____. *Building for Tomorrow: Putting Waste to Work.* San Francisco: Sierra Club Books, 1982.

Platt, Colin. *Medieval Southampton: The Port and Trading Community, AD 1000–1600.* London, Boston: Routledge and Kegan Paul, 1973.

_____. *The English Medieval Town.* New York: McKay, 1976.

Pocock, D. "Valued Landscapes in Memory: The View from Prebends' Bridge." *Transactions of the Institute of British Geographers.* vol. 7, no. 3, 1982, pp. 354–64.

Pohl, Frederik. *The Midas World: A Novel.* London: New English Library, 1985.

Porteus, D. "Approaches to Environmental Aesthetics," *Journal of Environmental Psychology.* vol. 2, no. 1, 1982, pp. 53–66.

Rapoport, Amos. *The Meaning of the Built Environment: A Non-Verbal Communication Approach.* Beverly Hills, CA: Sage Publications, 1982.

Rathje, William L. "The Garbage Project: A New Way of Looking at the Problem of Archaeology," *Archaeology.* vol. 27, no. 4, pp. 236–41.

Rathje, William L., and Wilson W. Hughes. "The Garbage Project as a Non-Reactive Approach: Garbage In . . . Garbage Out?" *Perspectives on Attitude Assessment: Surveys and Their Alternatives.* Proceedings of a conference held at The Bishop's Lodge, Santa Fe, NM, April 22–24, 1975. H. Wallace Sinaiko and Laurie A. Broedling, chairmen and eds. Champaign, IL: Pendleton Publications, 1976.

Robinson, William F. *Abandoned New England: Its Hidden Ruins and Where to Find Them.* Boston: New York Graphic Society, 1976.

Rocklin, Gene F. "Nuclear Disposal: Two Social Criteria," *Science*. 7 January 1977, pp. 23–31.

Rust, Edgar. "Development Without Growth: Lessons Derived from the U.S. Metropolitan Experience." Conference paper, Alternative Futures for Older Metropolitan Regions Conference, Youngstown, Ohio, May 1977.

Rustin, Bayard. *Have We Reached the End of the Second Reconstruction?* Bloomington, IN: Poynter Center, Indiana University, 1976.

Sabine, E.L. "Latrines and Cesspools of Medieval London." *Speculum*. 9 (1934), pp. 306–9.

_____. "City Cleaning in Medieval London." *Speculum*. 12 (1937), pp. 21–25.

Samuel, Raphael, ed. *East End Underworld: Chapters in the Life of Arthur Harding*. London: Routledge and Kegan Paul, 1981.

Satterthwaite, Sheafe. "Puckerbrush, Cellar Holes, Rubble: Observations on Abandonment in Vermont." *A Sense of Place: Images of the Vermont Landscape 1776–1976*. Burlington, VT: Robert Hull Fleming Museum, 1976.

Shapiro, Fred C. "Nuclear Waste." *New Yorker*. 19 October 1981, pp. 53–139.

Simonds, Charles. *Charles Simonds*. Chicago: Museum of Contemporary Art, 1981.

Smith, Peter F. *The Syntax of Cities*. London: Hutchinson, 1977.

Smithson, Robert. "Entropy Made Visible," (interview with Alison Sky) *The Writings of Robert Smithson: Essays with Illustrations*. ed. Nancy Holt. New York: New York University Press, 1979.

Stegner, Wallace. "The Dump Ground." *Wolf Willow: A History, Story and A Memory of the Last Plains Frontier*. New York: Viking Press, 1962.

Stevenson, Matilda Coxe. "The Zuni Indians: Their Mythology, Esoteric Fraternities, and Ceremonies." *Twenty-third Annual Report of the Bureau of American Ethnology to the Secretary of the Smithsonian Institution*. Washington, D.C.: Government Printing Office, 1904.

Stoke-on-Trent, England. "Reclamation Programme." n.p., n.d.

Taira, Koji. "Urban Poverty, Rag-Pickers, and the 'Ants' Villa in Tokyo." *Human Identity in the Urban Environment.* G. Bell and J. Tyrwhitt, eds. Harmondsworth, England: Penguin Books, 1972.

Thompson, Michael. *Rubbish Theory: The Creation and Destruction of Value.* Oxford: Oxford University Press, 1979.

Todd, John, and Nancy Jack Todd, eds. *The Village as Solar Ecology: Proceedings of the New Alchemy/Threshold Generic Design Conference.* East Falmouth, MA: New Alchemy Institute, 1980.

Todd, John, and George Tukel. *Reinhabiting Cities and Towns: Designing for Sustainability.* San Francisco: Planet Drum Foundation, 1981.

U.S. Dept. of Housing and Urban Development. *Abandoned Housing Research: A Compendium.* Washington, D.C.: 1973.

U.S. Dept. of Interior, Geological Survey. *Man Against Volcano: The Eruption on Heimaey, Vestmann Islands, Iceland."* Washington, D.C.: 1976.

U.S. Environmental Protection Agency. *Baltimore Demonstrates Gas Pyrolysis: Resource Recovery from Solid Waste.* Washington, D.C.: 1975.

U.S. Environmental Protection Agency. *Proceedings: 1975 Conference on Waste Reduction.* Washington, D.C.: 1975.

van Regteren Altena, H.H. "The Origin and Development of Dutch Towns." *World Archaeology.* vol. 2, no. 2, October 1970, pp. 128–41.

Veblen, Thorstein. *The Theory of the Leisure Class: An Economic Study in the Evolution of Institutions.* New York: Macmillan, 1912.

Wallwork, K.L. *Derelict Land: Origins and Prospects of a Land Use Problem.* North Pomfret, VT: David and Charles, 1974.

Ward, Colin, ed. *Vandalism.* London: Architectural Press, 1973.

Wolff, J. *Hermeneutic Philosophy and the Sociology of Art.* London, Boston: Routledge and Kegan Paul, 1975.

Wolman, M. Gordon, Stephen L. Feldman, and David Boelke. *An Evaluation of the Model Cities Sanitation Program of the City of Baltimore.* Johns Hopkins University, Department of Geography and Environmental Engineering, July 1972.

Wood, Denis. "Shadowed Spaces: in Defense of Indefensible Space." (unpublished) Raleigh, NC: School of Design, North Carolina State University, 1978.

Zimbardo, Philip G. "A Field Experiment in Auto Shaping." *Vandalism.* Colin Ward, ed. London: Architectural Press, 1973, pp. 85–90.

Zucker, Paul. *The Fascination of Decay; Ruins: Relic, Symbol, Ornament.* Ridgewood, NJ: Gregg Press, 1968.

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(continued from front flap)

be broken, make cleaning a joy, find compensations in decline, deal openly with abandonment, see death as a part of life?"

KEVIN LYNCH, who died in 1984 as this book was nearing completion, was a noted urban designer and professor of city planning at MIT for more than thirty years. His design projects include work on Boston's waterfront and the University Circle area of Cleveland. Kevin Lynch was much honored by his colleagues, receiving the American Institute of Planners Fiftieth Anniversary Award in 1967 and the American Institute of Architects Allied Professions Medal in 1974. Shortly before his death, he was named the recipient of the first Rexford G. Tugwell Award, the most prestigious recognition for city planners. His previous books include such classics in the field of environmental planning and design as *The Image of the City*, *What Time Is This Place*, and *A Theory of Good City Form*.

MICHAEL SOUTHWORTH, a student and colleague of Kevin Lynch, finished preparing the manuscript of *Wasting Away* for publication and contributed the illustrations and the photographic essay "Looking at Waste." He is a professor of urban design and environmental planning at the University of California at Berkeley. Among his many award-winning projects is the conceptual plan for the Lowell Urban National Cultural Park in Lowell, Massachusetts, a plan for creating an educative environment based upon the heritage of the first planned industrial city in America. His books include *Maps* and the *AIA Guide to Boston* (both with Susan Southworth).

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Praise for *Wasting Away*

"Kevin Lynch always wanted to change the world; and the closest he came to it was by changing people's images. *Wasting Away*, skillfully and sensitively cast in final form by Michael Southworth, has the usual wit, wisdom, learning and innovative perspectives of Lynch's most admired classics; and as in the past, it manages to transform and deepen our understanding of precisely those aspects of his themes most neglected, misunderstood or undervalued."

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"At a time when the world's cumulative environmental indiscretions are catching up with us, Kevin Lynch's focus on waste is particularly compelling. In typical Lynch fashion, he approaches the subject comprehensively and globally and makes us think. After reading *Wasting Away* it is hard not to think twice about personal and community bad habits and to search for solutions that must inevitably involve major changes in the way we live. Michael Southworth has done a major piece of research and editing in putting together this very important work from materials left by the late Kevin Lynch. In its own way this may prove to be as important a volume as Lynch's *Site Planning*."

—Allan B. Jacobs, Professor of City and Regional Planning,
University of California at Berkeley

"Kevin Lynch had a lifelong love affair with cities and his many-sided curiosity left no aspect of them untouched...One unspoken but very important ingredient of city life that had a special fascination for him was how it managed its waste problems. To him waste meant anything that was no longer useful, from old buildings and roads to human waste, as well as the more conventional pollutants that we all now realize threaten the planet...Layman and expert will both learn from and enjoy this unusual book."

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