WASTE NOT WANT NOT

"WASTE: . . Spoil or destruction, done or permitted, to lands, houses, gardens, trees, or other corporeal hereditaments, by the tenant thereof . . . Any unlawful act or omission of duty on the part of the tenant which results in permanent injury to the inheritance . . ." Black's Law Dictionary

America is not only a land of industry and commerce, it's also a land of consumption and waste, producing between 12 and 14 *billion* tons of waste annually. Much of our waste consists of *organic* material including food residues, municipal leaves, yard materials, agricultural residues, and human and livestock manures, all of which should be returned to the soil from which they originated. These organic materials are very valuable agriculturally, a fact well known among organic gardeners and farmers.

Feces and urine are examples of natural, beneficial, organic materials excreted by the bodies of animals after completing their digestive processes. They are only "waste" when we discard them. When recycled, they are resources, and are often referred to as manures, but never as *waste*, by the people who do the recycling.

We do not recycle waste. It's a common semantic error to say that waste is, can be, or should be recycled. Resource materials are recycled, but waste is never recycled. That's why it's called "waste." Waste is any material that is discarded and has no further use. We humans have been so wasteful for so long that the concept of waste

elimination is foreign to us. Yet, it is an important concept.

When a potato is peeled, the peels aren't kitchen waste — they're still potato peels. When they're collected for composting, they are being recycled and no waste is produced.

Composting professionals sometimes refer to recycled materials as "waste." Many of the people who are developing municipal composting programs came from the waste management field, a field in which refuse has always been termed "waste." Today, however, the use of the term "waste" to describe recycled materials is an unpleasant semantic habit that must be abandoned. Otherwise, one could refer to leaves in the autumn as "tree waste," because they are no longer needed by the tree and are discarded. Yet, when one walks into the forest, where does one see waste? The answer is "nowhere," because the forest's organic material is recycled naturally, and no waste is created. Ironically, leaves and grass clippings are referred to as "yard waste" by some compost professionals, another example of the persistent waste mentality plaguing our culture.

One organism's excrement is another's food. Everything is recycled in natural systems, thereby eliminating waste. Humans create waste because we insist on ignoring the natural systems upon which we depend. We are so adept at doing so that we take waste for granted and have given the word a prominent place in our vocabulary. We have kitchen "waste," garden "waste," agricultural "waste," human "waste," municipal "waste," "biowaste," and on and on. Yet, our long-term survival requires us to learn to live in harmony with our host planet. This also requires that we understand natural cycles and incorporate them into our day to day lives. In essence, this means that we humans must attempt to eliminate waste altogether. As we progressively eliminate waste from our living habits, we can also progressively eliminate the word "waste" from our vocabulary.

"Human waste" is a term that has traditionally been used to refer to human excrements, particularly fecal material and urine, which are by-products of the human digestive system. When *discarded*, as they usually are, these materials are colloquially known as human *waste*, but when *recycled* for agricultural purposes, they're known by various names, including *night soil* when applied raw to fields in Asia.

Humanure, unlike *human waste*, is not waste at all — it is an organic resource material rich in soil nutrients. Humanure originated from the soil and can be quite readily returned to the soil, especially if converted to humus through the composting process.

Human *waste* (*discarded* feces and urine), on the other hand, creates significant environmental problems, provides a route of transmission for disease, and deprives humanity of valuable soil fertility. It's also one of the primary ingredients in sewage, and is largely responsible for much of the world's water pollution.

A clear distinction must be drawn between humanure and sewage because they are two very different things. Sewage can include waste from many sources — industries, hospitals and garages, for example. Sewage can also contain a host of contaminants such as industrial chemicals, heavy metals, oil and grease, among others. Humanure, on the other hand, is strictly human fecal material and urine.

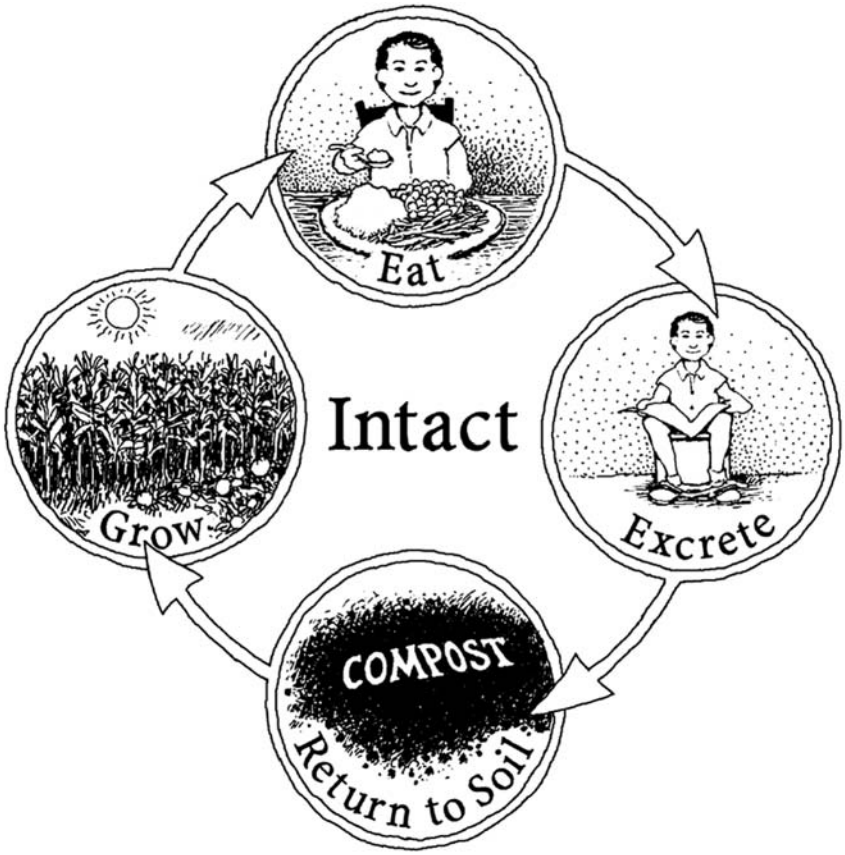
What, in truth, *is* human waste? Human waste is garbage, cigarette butts, plastic six-pack rings, styrofoam clamshell burger boxes, deodorant cans, disposable diapers, worn out appliances, unrecycled pop bottles, wasted newspapers, junk car tires, spent batteries, junk mail, nuclear contamination, food packaging, shrink wrap, toxic chemical dumps, exhaust emissions, discarded plastic CD disks, the five billion gallons of drinking water we flush down our toilets every day, and the millions of tons of organic material discarded into the environment year after year after year.

THE HUMAN NUTRIENT CYCLE

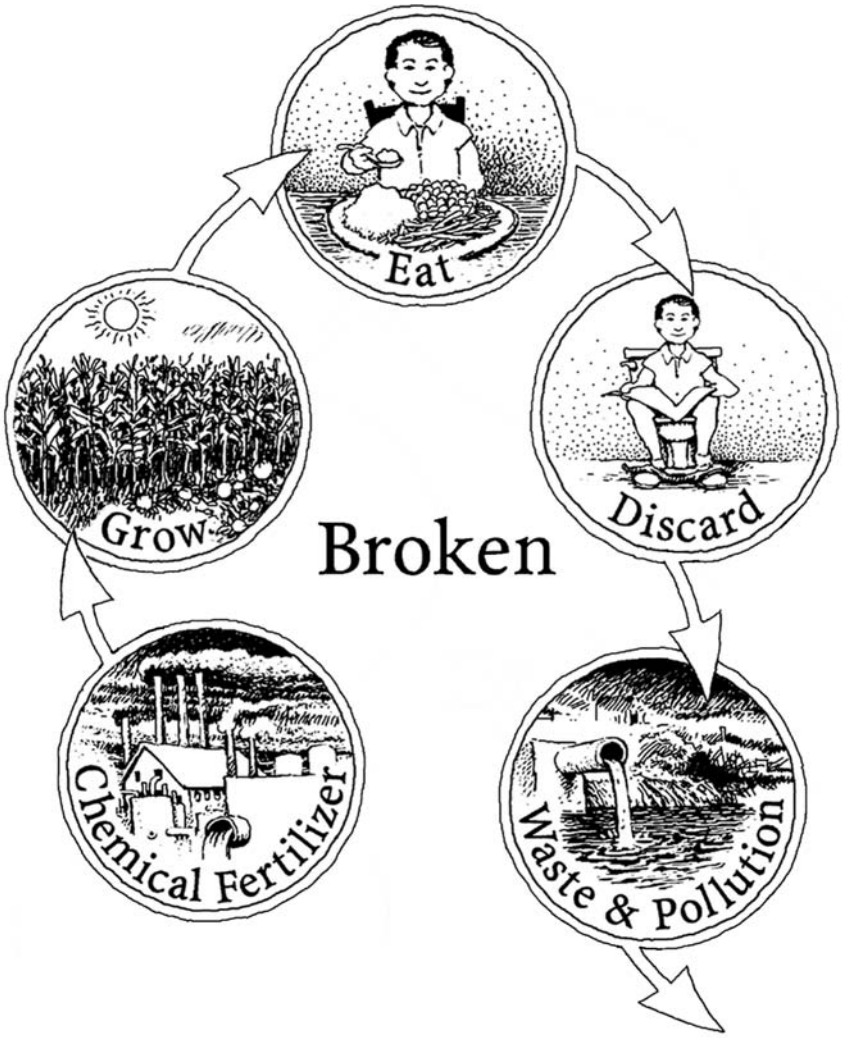
When crops are produced from soil, it is advisable that the organic residues resulting from those crops, including animal excrements, be returned to the soil from which the crops originated. This recycling of organic residues for agricultural purposes is fundamental to sustainable agriculture. Yet, spokespersons for sustainable agriculture movements remain silent about using humanure for agricultural purposes. Why?

Perhaps the silence is because there is currently a profound lack of knowledge and understanding about what is referred to as the "human nutrient cycle" and the need to keep the cycle intact. The human nutrient cycle goes like this: a) we grow food, b) we eat it, c) we collect and process the organic residues (feces, urine, food scraps and agricultural materials) and d) we then return the processed organic material back to the soil, thereby enriching the soil and enabling more food to be grown. This cycle can be repeated, endlessly. This is a process that mimics the cycles of nature and enhances our ability to survive on this planet. When our food refuse materials are

The *HUMAN NUTRIENT CYCLE*



The Human Nutrient Cycle is an endless natural cycle. In order to keep the cycle intact, food for humans must be grown on soil that is enriched by the continuous addition of organic materials recycled by humans, such as humanure, food scraps and agricultural residues. By respecting this cycle of nature, humans can maintain the fertility of their agricultural soils indefinitely, instead of depleting them of nutrients, as is common today.



Food-producing soils must be left more fertile after each harvest due to the ever-increasing human population and the need to produce more food with each passing year. Instead, we deplete our soils of nutrients by discarding organic materials as waste, rather than returning them back to the soil.

instead discarded as waste, the natural human nutrient cycle is broken, creating problems such as pollution, loss of soil fertility and abuse of our water resources.

We in the United States each waste about a thousand pounds of humanure every year, which is discarded into sewers and septic systems throughout the land. Much of the discarded humanure finds its final resting place in a landfill, along with the other solid waste we Americans discard, which, coincidentally, also amounts to about a thousand pounds per person per year. For a population of 305 million people, that adds up to nearly 305 million tons of solid waste personally discarded by us every year, at least half of which would be valuable as an agricultural resource.

The practice we humans have frequently employed for waste disposal has been quite primitive — we dump our garbage into holes in the ground, then bury it. That's now called a landfill, and for many years they were that simple. Today's new "sanitary" landfills are lined with waterproof, synthetic materials to prevent the leaching of garbage juice into groundwater supplies. Yet, only about a third of the active dumps in the U.S. have these liners.[1] Interestingly, the lined landfills bear an uncanny resemblance to gigantic disposable diapers. They're gargantuan plastic-lined receptacles where we lay our crap to rest, the layers being carefully folded over and the end products of our wasteful lifestyles buried as if they were in garbage mausoleums intended to preserve our sludge and kitchen trash for posterity. We conveniently flush our toilets, and the resultant sewage sludge is transported to these landfills, tucked into these huge disposable diapers and buried.

This is not to suggest that *sewage* should be used to produce food crops. Sewage consists of humanure collected with hazardous materials such as industrial, medical and chemical wastes, all carried in a common waterborne waste stream. Or in the words of Gary Gardner (State of the World 1998), *"Tens of thousands of toxic substances and chemical compounds used in industrial economies, including PCBs, pesticides, dioxins, heavy metals, asbestos, petroleum products, and industrial solvents, are potentially part of sewage flows."* Not to mention pathogenic organisms. When raw sewage was used agriculturally in Berlin in 1949, for example, it was blamed for the spread of worm-related diseases. In the 1980s, it was said to be the cause of typhoid fever in Santiago, and in 1970 and 1991 it was blamed for cholera outbreaks in Jerusalem and South America, respectively.[2]

Humanure, on the other hand, when kept out of the sewers,

collected as a resource material, and properly composted, makes a suitable agricultural resource for food crops. When we combine our manure with other organic materials such as food and farming byproducts, we can achieve a blend that is irresistible to certain beneficial microorganisms.

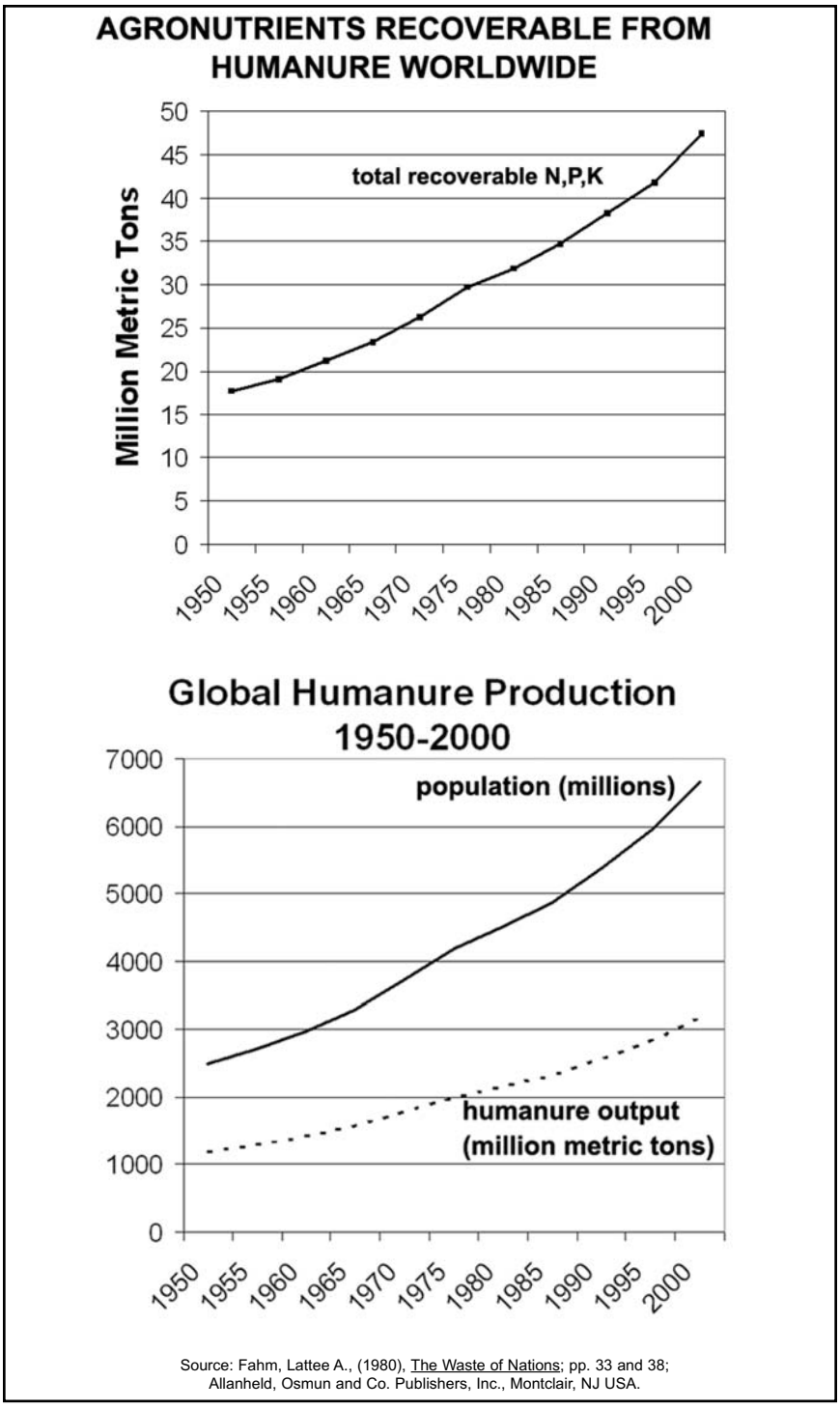
The U.S. EPA estimates that nearly 22 million tons of food waste are produced in American cities every year. Throughout the United States, food losses at the retail, consumer and food services levels are estimated to have been 48 million tons in 1995.[3] That would make great organic material for composting with humanure. Instead, only a small percentage of our discarded food is being composted in the U.S.; the remaining is incinerated or buried in landfills.[4]

The Organization for Economic Cooperation and Development, a group made up primarily of western industrial countries, estimates that 36% of the waste in their member states is organic food and garden materials. If paper is also considered, the organic share of the waste stream is boosted to nearly an incredible two thirds! In developing countries, organic material typically makes up one half to two thirds of the waste stream.[5] According to the EPA, almost 80% of the net discarded solid waste in the U.S. is composed of organic material.

It is becoming more and more obvious that it is unwise to rely on landfills to dispose of recyclable materials. Landfills overflow and new ones need to be built to replace them. In fact, we may be lucky that landfills are closing so rapidly — they are notorious polluters of water, soil, and air. Of the ten thousand landfills that have closed since 1982, 20% are now listed as hazardously contaminated Superfund sites. A 1996 report from the state of Florida revealed that groundwater contamination plumes from older, unlined landfills can be longer than 3.4 miles, and that 523 public water supplies in Florida are located within one mile of these closed landfills, while 2,700 lie within three miles.[6] No doubt similar situations exist throughout the United States.

Organic material disposed of in landfills also creates large quantities of methane, a major global-warming gas. U.S. landfills are *"among the single greatest contributors of global methane emissions,"* according to the Natural Resources Defense Council. According to the EPA, methane is 20 to 30 times more potent than CO2 as a greenhouse (global warming) gas on a molecule to molecule basis.[7]

Tipping fees (the fee one pays to dump waste) at landfills in every region of the U.S. have been increasing at more than twice the



Source: Fahm, Lattee A., (1980), The Waste of Nations; pp. 33 and 38; Allanheld, Osmun and Co. Publishers, Inc., Montclair, NJ USA.

rate of inflation since 1986. In fact, since then, they have increased 300% and are expected to continue rising at this rate.[8]

In developing countries, the landfill picture is also bleak. In Brazil, for example, 99% of the solid waste is dumped into landfills and three fourths of the 90,000 tons per day ends up in open dumps.[9] Slowly we're catching on to the fact that this throw-away trend has to be turned around. We can't continue to throw "away" usable resources in a wasteful fashion by burying them in disappearing, polluting, increasingly expensive landfills.

If we had scraped up all the human excrement in the world and piled it on the world's tillable land in 1950, we'd have applied nearly 200 metric tons per square mile at that time (roughly 690 pounds per acre). In the year 2000, we would have been collecting more than *double* that amount because the global population is increasing, but the global land mass isn't. In fact, the global area of agricultural land is steadily *decreasing* as the world loses, for farming and grazing, an area the size of Kansas each year.[10] The world's burgeoning human population is producing a ballooning amount of organic refuse which will eventually have to be dealt with responsibly and constructively. It's not too soon to begin to understand human organic refuse as a valuable resource begging to be recycled.

In 1950, the dollar value of the agricultural nutrients in the world's gargantuan pile of humanure was 6.93 billion dollars. In 2000, it would have been worth 18.67 billion dollars calculated in *1975* prices.[11] This is money currently being flushed out somewhere into the environment where it shows up as pollution and landfill material. Every pipeline has an outlet somewhere; everything thrown "away" just moves from one place to another. Humanure and other organic refuse materials are no exception. Not only are we flushing "money" away, we're paying to do so. The cost is not only economic, it's environmental.

SOILED WATER

The world is divided into two categories of people: those who shit in their drinking water supplies and those who don't. We in the western world are in the former class. We defecate into water, usually purified drinking water. After polluting the water with our excrements, we flush the polluted water "away," meaning we probably don't know where it goes, nor do we care.

Every time we flush a toilet, we launch five or six gallons of polluted water out into the world.[12] That would be like defecating into

FUN FACTS
about water

- If all the world's drinking water were put in one cubical tank, the tank would measure only 95 miles on each side.
- People currently lacking access to clean drinking water: 1.2 billion.
- % of world's households that must fetch water outside their homes: 67
- % increase in the world's population by mid 21st century: 100
- % increase in the world's drinking water supplies by mid 21st century: 0
- Amount of water Americans use every day: 340 billion gallons.
- Number of gallons of water needed to produce a car: 100,000
- Number of cars produced every year: 50 million.
- Amount of water annually required by a nuclear reactor: 1.9 cubic miles.
- Amount of water used by nuclear reactors every year: the equivalent of one and a third Lake Eries.

Sources: Der Spiegel, May 25, 1992; and Annals of Earth, Vol. 8, Number 2, 1990; Ocean Arks International, One Locust Street, Falmouth, MA 02540.

WATER, WATER EVERYWHERE

AND IT'S ALL GOING DOWNHILL

• In the mid 1980s, the 2,207 publicly owned coastal sewage treatment works were discharging 3.619 trillion gallons per year of treated wastewater into the coastal environment.[14]

• In 2004, 850 billion gallons of untreated wastewater and storm water were released as combined sewer overflows and between 3 billion and 10 billion gallons of untreated wastewater from sanitary sewer overflows are released each year in the U.S.[43]

• In 1997, pollution caused at least 4,153 beach closings and advisories, 69% of which were caused by elevated bacterial pollution in the water.[15]

• In 2001, of the 2,445 beaches surveyed by the EPA, 672 were affected by advisories or closings, most often due to elevated bacteria levels.

• In 2003, there were more than 18,000 days of pollution-related closings and advisories at U.S. beaches according to NRDC's annual report on beachwater quality. 88% of the closings and advisories stemmed from the presence of bacteria associated with fecal contamination. By 2007, the number of closing and advisory days at ocean, bay, and Great Lakes beaches had topped 20,000 for the third consecutive year. The number due to sewage spills and overflows more than tripled from 2006 to 2007.

• According to the U.S. Environmental Protection Agency, the primary cause reported for beach closings is the overflow of combined storm-water and sewage systems with insufficient capacity to retain heavy rains for processing through sewage treatment plants.

• In 2002, New York State sued Yonkers over sewage discharges, alleging that thousands of gallons per day of untreated sewage were discharged into the Bronx River from at least four pipes owned and operated by the city. Laboratory results showed that the pollution contained the bacteria *fecal coliform*, an indicator of raw sewage, in concentrations as high as 250 times more than allowed by New York State water quality standards.

• In 2002, a federal judge found Los Angeles liable for 297 sewage spills. From 1993 to January, 2002, the city reported 3,000 sewage spills. Los Angeles has about 6,500 miles of sewers. The spills end up in waterways, are carried into the ocean and pollute beaches.[16]

• United Nations Environment Program (UNEP) studies show that over 800 million people in coastal South Asia have no basic sanitation services, putting them at high risk from sewage-related diseases and death.

• In 2000, 55% of U.S. lakes, rivers and estuaries were not clean enough for fishing or swimming according to EPA testimony before Congress in 2002. In 1995, 40% were too polluted to allow fishing, swimming or other aquatic uses at any time of the year, according to the United States Environmental Protection Agency.

• In January of 2005 it was reported that twenty-two percent of U.S. coastal waters were unsuitable for fishing, based on EPA guidelines for moderate consumption of recreationally-caught fish.

a five gallon office water jug and then dumping it out before anyone could drink any of it. Then doing the same thing when urinating. Then doing it every day, numerous times. Then multiplying that by about 305 million people in the United States alone.

Even after the contaminated water is treated in wastewater treatment plants, it may still be polluted with excessive levels of nitrates, chlorine, pharmaceutical drugs, industrial chemicals, detergents and other pollutants. This "treated" water is discharged directly into the environment.

It is estimated that by 2010, at least half of the people in the U.S. will live in coastal cities and towns, further exacerbating water pollution problems caused by sewage. The degree of beach pollution becomes a bit more personal when one realizes that current EPA recreational water cleanliness standards still allow 19 illnesses per 1,000 saltwater swimmers, and 8 per 1,000 freshwater swimmers.[13] Some of the diseases associated with swimming in wastewater-contaminated recreational waters include typhoid fever, salmonellosis, shigellosis, hepatitis, gastroenteritis, pneumonia, and skin infections.[17]

If you don't want to get sick from the water you swim in, don't submerge your head. Otherwise, you may end up like the swimmers in Santa Monica Bay. People who swam in the ocean there within 400 yards (four football fields) of a storm sewer drain had a 66% greater chance of developing a "significant respiratory disease" within the following 9 to 14 days after swimming.[18]

This should come as no surprise when one takes into consideration the emergence of antibiotic-resistant bacteria. The use of antibiotics is so widespread that many people are now breeding antibiotic resistant bacteria in their intestinal systems. These bacteria are excreted into toilets and make their way to wastewater treatment plants where *the antibiotic resistance can be transferred to other bacteria*. Wastewater plants can then become breeding grounds for resistant bacteria, which are discharged into the environment through effluent drains. Why not just chlorinate the water before discharging it? It usually *is* chlorinated beforehand, but research has shown that chlorine seems to *increase* bacterial resistance to some antibiotics.[19]

Not worried about antibiotic-resistant bacteria in your swimming area? Here's something else to chew on: 50 to 90% of the pharmaceutical drugs people ingest can be excreted down the toilet and out into the waterways *in their original or biologically active forms*. Furthermore, drugs that have been partially degraded before excre-

tion can be converted to their original active form by environmental chemical reactions. Pharmaceutical drugs such as chemotherapy drugs, antibiotics, antiseptics, beta-blocker heart drugs, hormones, analgesics, cholesterol-lowering drugs and drugs for regulating blood lipids have turned up in such places as tap water, groundwater beneath sewage treatment plants, lake water, rivers and in drinking water aquifers. Think about *that* the next time you fill your glass with water.[20]

Long Island Sound receives over a billion gallons of treated sewage every day — the waste of eight million people. So much nitrogen was being discharged into the Sound from the *treated* wastewater that it caused the aquatic oxygen to disappear, rendering the marine environment unsuitable for the fish that normally live there. The twelve treatment plants that were to be completed along the Sound by 1996 were expected to remove 5,000 pounds of nitrogen daily. Nitrogen is normally a soil nutrient and agricultural resource, but instead, when flushed, it becomes a dangerous water pollutant.[21] On December 31, 1991, the disposal of U.S. sewage sludge into the ocean was banned. Before that, much of the sewage sludge along coastal cities in the United States had simply been dumped out to sea.

The discharging of sludge, sewage, or wastewater into nature's waterways invariably creates pollution. The impacts of polluted water are far-ranging, causing the deaths of 25 million people each year, three-fifths of them children.[22] Half of all people in developing countries suffer from diseases associated with poor water supply and sanitation.[23] Diarrhea, a disease associated with polluted water, kills six million children each year in developing countries, and it contributes to the deaths of up to 18 million people.[24] At the beginning of the 21st century, one out of four people in developing countries still lacked clean water, and two out of three lacked adequate sanitation.[25]

Proper sanitation is defined by the World Health Organization as any excreta *disposal* facility that interrupts the transmission of fecal contaminants to humans.[26] This definition should be expanded to include excreta *recycling* facilities. Compost toilet systems are now becoming internationally recognized as constituting "proper sanitation," and are becoming more and more attractive throughout the world due to their relatively low cost when compared to waterborne waste systems and centralized sewers. In fact, compost toilet systems yield a dividend — *humus*, which allows such a sanitation system to yield a net profit, rather than being a constant finan-

cial drain (no pun intended). The obsession with flush toilets throughout the world is causing the problems of international sanitation to remain unresolved. Many parts of the world cannot afford expensive and water consumptive waste disposal systems.

We're also depleting our water supplies, and flushing toilets is one way it's being wasted. Of 143 countries ranked for per capita water usage by the World Resources Institute, America came in at #2 using *188 gallons per person per day* (Bahrain was #1).[27] Water use in the U.S. increased by a factor of 10 between 1900 and 1990, increasing from 40 billion gallons per day to 409 billion gallons per day.[28] The amount of water we Americans require overall, used in the finished products each of us consumes, plus washing and drinking water, amounts to a staggering 1,565 gallons per person per day, which is three times the rate of Germany or France.[29] This amount of water is equivalent to flushing our toilets 313 times every day, about once every minute and a half for eight hours straight. By some estimates, it takes one to two thousand tons of water to flush one ton of human waste.[30] Not surprisingly, the use of groundwater in the United States exceeds replacement rates by 21 billion gallons a day.[31]

WASTE VS. MANURE

By dumping soil nutrients down the toilet, we increase our need for synthetic chemical fertilizers. Today, pollution from agriculture, caused from siltation (erosion) and nutrient runoff due to excessive or incorrect use of fertilizers,[32] is now the *"largest diffuse source of water pollution"* in our rivers, lakes, and streams.[33] Chemical fertilizers provide a quick fix of nitrogen, phosphorous and potassium for impoverished soils. However, it's estimated that 25-85% of chemical nitrogen applied to soil and 15-20% of the phosphorous and potassium are lost to leaching, which pollutes groundwater.[34]

This pollution shows up in small ponds which become choked with algae as a result of the unnatural influx of nutrients. From 1950 to 1990, the global consumption of artificial fertilizers rose tenfold, from 14 million tons to 140 million tons.[35] In 1997, U.S. farmers used 20 million tons of synthetic fertilizers,[36] and half of all manufactured fertilizer ever made has been used just since 1982.[37] Nitrate pollution from excessive artificial fertilizer use is now one of the most serious water pollution problems in Europe and North America. Nitrate pollution can cause cancer and even brain damage or death in infants.[38] All the while, hundreds of millions of tons of compostable organic

materials are generated in the U.S. each year, and either buried in landfills, incinerated, or discharged as waste.

The squandering of our water resources and pollution from sewage and synthetic fertilizers results in part from the belief that humanure and food scraps are waste materials rather than recyclable natural resources. There is, however, an alternative. Humanure can undergo a process of bacterial digestion and then be returned to the soil. This process is usually known as *composting*. This is the missing link in the human nutrient recycling process.

Raw humanure carries with it a significant potential for danger in the form of disease pathogens. These diseases, such as intestinal parasites, hepatitis, cholera and typhoid are destroyed by composting, either when the retention time is adequate in a low temperature compost pile, or when the composting process generates internal, biological heat, which can kill pathogens in a matter of minutes.

Raw applications of humanure to fields are not hygienically safe and can assist in the spread of various diseases. Americans who have traveled to Asia tell of the "horrible stench" of night soil that wafts through the air when it is applied to fields. For these reasons, it is imperative that humanure always be composted before agricultural application. Proper composting destroys possible pathogens and results in a pleasant-smelling material.

On the other hand, raw night soil applications to fields in Asia do return humanure to the land, thereby recovering a valuable resource which is then used to produce food for humans. Cities in China, South Korea and Japan recycle night soil around their perimeters in greenbelts where vegetables are grown. Shanghai, China, a city with a population of 14.2 million people in 2000,[39] produces an exportable surplus of vegetables in this manner.

Humanure can also be used to feed algae which can, in turn, feed fish for aquacultural enterprises. In Calcutta, such an aquaculture system produces 20,000 kilograms of fresh fish daily.[40] The city of Tainan, Taiwan, is well known for its fish, which are farmed in over 6,000 hectares of fish farms fertilized by humanure. There, humanure is so valuable that it's sold on the black market.[41]

RECYCLING HUMANURE

Humanure can be naturally recycled by feeding it to the organisms that crave it as food. These voracious creatures have been around for millions, and theoretically, *billions* of years. They've

patiently waited for us humans to discover them. Mother Nature has seeded our excrements, as well as our garbage, with these "friends in small places," who will convert our organic discards into a soil-building material right before our eyes. Invisible helpers, these creatures are too small to be seen by the human eye and are therefore called *micro*organisms. The process of feeding organic material to these microorganisms in the presence of oxygen is called *composting*. Proper composting ensures the destruction of potential human pathogens (disease-causing microorganisms) in humanure. Composting also converts the humanure into a new, benign, pleasant-smelling and beneficial substance called *humus*, which is then returned to the soil to enrich it and enhance plant growth.

Incidentally, *all* animal manures benefit from composting, as today's farmers are now discovering. Composted manures don't leach like raw manures do. Instead, compost helps hold nutrients in soil systems. Composted manures also reduce plant disease and insect damage and allow for better nutrient management on farms. In fact, two tons of compost will yield far more benefits than five tons of manure.[42]

Human manure can be mixed with other organic materials from human activity such as kitchen and food scraps, grass clippings, leaves, garden refuse, paper products and sawdust. This mix of materials is necessary for proper composting to take place, and it will yield a soil additive suitable for food gardens as well as for agriculture.

One reason we humans have not "fed" our excrement to the appropriate organisms is because we didn't know they existed. We've only learned to see and understand microscopic creatures in our recent past. We also haven't had such a rapidly growing human population in the past, nor have we been faced with the dire environmental problems that threaten our species today like buzzards circling a dying animal.

It all adds up to the fact that the human species must inevitably evolve. Evolution means change, and change is often resisted as old habits die hard. Flush toilets and bulging garbage cans represent well entrenched habits that must be rethought and reinvented. If we humans are half as intelligent as we think we are, we'll eventually get our act together. In the meantime, we're realizing that nature holds many of the keys we need to unlock the door to a sustainable, harmonious existence on this planet. Composting is one of those keys, but it has only been relatively recently discovered by the human race. Its utilization is now beginning to mushroom worldwide.

Back to Chapter 1 Go to next chapter.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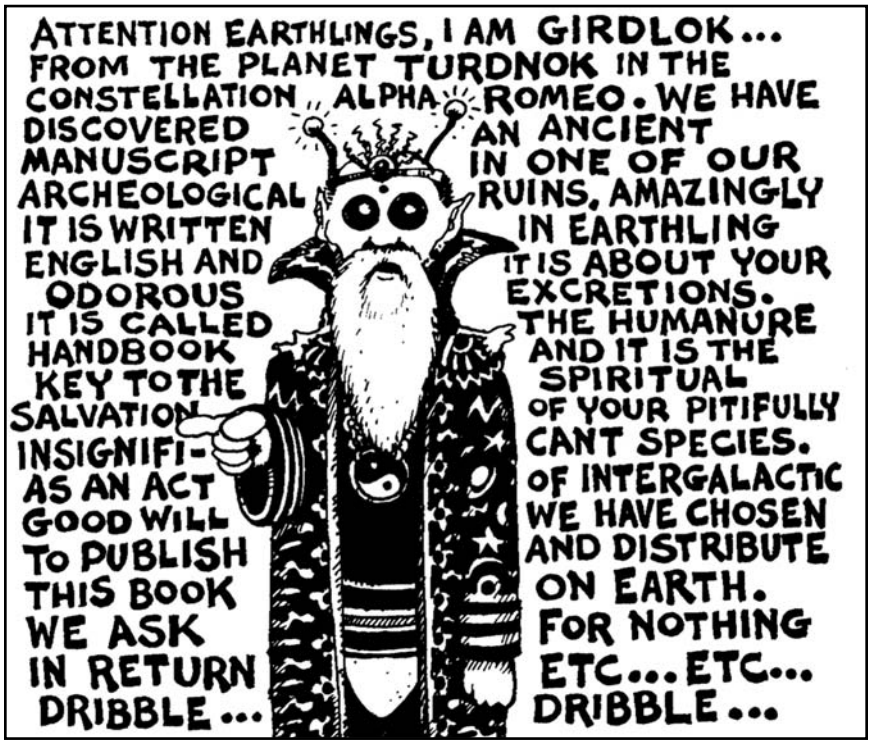
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