THE TAO OF COMPOST

Organic material should be recycled by every person on the planet, and recycling should be as normal as brushing teeth or bathing. Organic materials can be collected by municipalities and composted at central composting facilities. This is now done in many parts of the world where food discards are composted for urban communities. Toilet materials are not yet being collected and centrally composted in very many places, although such collection will undoubtedly increase as time passes.

We can compost our own organic material in our own personal compost bins in our own backyards. This is already becoming commonplace and compost bins are now popping up in backyards everywhere like mushrooms after a rain. Composting need not cost money and it can be practiced by anyone in the world at probably any location where plants can grow. Therefore, it is important that we learn to understand what compost is and how it can be made.

It is also important that we understand how to compost our toilet materials in a safe and simple manner. A low-cost composting toilet system can be very useful as a back-up toilet in an emergency situation when electrical or water services are disrupted, or when the water supply is diminished as during a drought, when flushing drinking water down toilets becomes especially ridiculous. It can also be very useful in any area where water or electricity is scarce or non-exis-
tent, as well as in developing countries where there may be many people with little or no money to buy commercial composting toilets. Finally, a simple, low-cost composting toilet system is attractive to anyone seeking a low-impact lifestyle, and who is willing to make the minimal effort to compost their organic residues. This chapter details how to compost toilet materials by using a simple, easy, low or no-cost method called a humanure toilet.

The organic materials our bodies excrete can be composted much the same as any apple core or potato peel — by being added to a compost pile. There are essentially two ways to do this. The first is to construct or purchase a toilet which deposits directly into a composting chamber. This is discussed and illustrated in Chapter 6. Such toilets must be properly managed if thermophilic conditions are desired; most commercial composting toilets do not achieve such conditions, and are not meant to.

The second, less expensive and simpler method is to use one’s toilet as a collection device, much the same as any compost receptacle, and then compost the contents in a separate compost pile. This simple technique can be done without unpleasant odors, and the toilet can be quite comfortably situated inside one’s home. Moving toilet material to a compost bin, however, is an activity that many individuals have no interest in doing, not because it is a burdensome task — for a family of four it should involve a twenty minute trip to a compost bin about every week — but because it’s shit, for God’s sake.

The problem is not practical, it is psychological. Many people may consider the idea of composting their own excrement to be beneath them. In India, such a task was relegated to the “untouchables,” the lowest caste of society. The act of carrying a container of one’s own excrement to a recycling bin is an act of humility, and humility is sometimes in short supply. Eventually, toilets in general will be redesigned as collection devices and their contents will be collected and composted as a service by municipal workers. Until then, however, those of us who want to make compost rather than sewage must do it by our own humble selves.

PRIMAL COMPOST

Try to imagine yourself in an extremely primitive setting, perhaps sometime around 10,000 B.C. Imagine that you’re slightly more enlightened than your brutish companions and it dawns on you one day that your feces should be disposed of in a different manner.
Everyone else is defecating in the back of the cave, creating a smelly, fly-infested mess, and you don't like it.

Your first revelation is that smelly refuse should be deposited in one place, not spread around for everyone to step in, and it should be deposited away from one's living area. You watch the wild cats and see that they each go to a special spot to defecate. But the cats are still one step ahead of the humans, as you soon find out, because they cover their excrement.

When you've shat outside the cave on the ground in the same place several times, you see that you've still created a foul-smelling, fly-infested mess. Your second revelation is that the refuse you're depositing on the ground should be covered after each deposit. So you scrape up some leaves every time you defecate and throw them over the feces. Or you pull some tall grass out of the ground and use it for cover.

Soon your companions are also defecating in the same spot and covering their fecal material as well. They were encouraged to follow your example when they noticed that you had conveniently located the defecation spot between two large rocks, and positioned logs across the rocks to provide a convenient perch, allowing for care-free defecation.

A pile of dead leaves is now being kept beside the toilet area in order to make the job of covering it more convenient. As a result, the offensive odors of human feces and urine no longer foul the air. Instead, it's food scraps that are generating odors and attracting flies. This is when you have your third revelation: food scraps should be deposited on the same spot and covered as well. Every stinky bit of refuse you create is now going to the same place and is being covered with a natural material to eliminate odor. This hasn't been hard to figure out, it makes good sense, and it's easy to do.

You've succeeded in solving three problems at once: no more human waste scattered around your living area, no more food garbage and no more offensive odors assaulting your keen sense of smell and generally ruining your day. Eventually, you also begin to realize that the illnesses that were prone to spread through the group have subsided, a fact that you don't understand, but you suspect may be due to the group's new found hygienic practices.

Quite by accident, you've succeeded in doing one very revolutionary thing: you've created a compost pile. You begin to wonder what's going on when the pile gets so hot it's letting off steam. What you don't know is that you've done exactly what nature intended you to do.
by piling all your organic refuse together, layered with natural, biodegradable cover materials. In fact, nature has "seeded" your excrement with microscopic creatures that proliferate in and digest the pile you've created. In the process, they heat the compost to such an extent that disease-causing pathogens resident in the humanure are destroyed. The microscopic creatures would not multiply rapidly in the discarded refuse unless you created the pile, and thereby the conditions which favor their proliferation.

Finally, you have one more revelation, a big one. You see that the pile, after it gets old, sprouts all kind of vibrant plant growth. You put two and two together and realize that the stinking refuse you carefully disposed of has been transformed into rich earth and ultimately into food. Thanks to you, humankind has just climbed another step up the ladder of evolution.

There is one basic problem with this scenario: it didn't take place 12,000 years ago — it's taking place now. Compost microorganisms are apparently very patient. Not much has changed since 10,000 B.C. in their eyes. The invisible creatures that convert humanure into humus don't care what composting techniques are used today anymore than they cared what techniques may have been used eons ago, so long as their needs are met. And those needs haven't changed in human memory, nor are they likely to change as long as humans roam the earth. Those needs include: 1) temperature (compost microorganisms won't work if frozen); 2) moisture (they won't work if too dry or too wet); 3) oxygen (they won't work without it); and 4) a balanced diet (otherwise known as balanced carbon/nitrogen). In this sense, compost microorganisms are a lot like people. With a little imagination, we can see them as a working army of microscopic people who need the right food, water, air and warmth.

The art of composting, then, remains the simple and yet profound art of providing for the needs of invisible workers so they work as vigorously as possible, season after season. And although those needs may be the same worldwide, the techniques used to arrive at them may differ from eon to eon and from place to place.

Composting differs from place to place because it is a bioregional phenomenon. There are thousands of geographic areas on the Earth each with their own unique human population, climatic conditions and available organic materials, and there will be potentially thousands of individual composting methods, techniques and styles. What works in one place on the planet for one group of people may not work for another group in another geographic location. For exam-
Close Encounters of the Turd Kind

Simple methods of collecting and composting humanure are sometimes called cartage systems or container systems, as the manure is carried to a compost bin, often in containers or waterproof vessels. People who utilize such simple techniques for composting humanure simply take it for granted that humanure recycling is one of the regular and necessary responsibilities for sustainable human life on this planet.

How it works is a model of simplicity. One begins by depositing one’s organic refuse (feces and urine) into a receptacle intended for that purpose, with about a five-gallon (20 liter) capacity. Food scraps should be collected in a separate receptacle, but can also be deposited into the toilet receptacle, if necessary. A five-gallon capacity is recommended because a larger size would be too heavy to carry when full. If a full five-gallon receptacle is still too heavy for someone to carry, it can be emptied when only half full.

The contents of the toilet are always kept covered with a clean, organic cover material such as rotted sawdust, peat moss, leaf mould, rice hulls or grass clippings, in order to prevent odors, absorb urine, and eliminate any fly nuisance. Urine is deposited into the same receptacle, and as the liquid surface rises, more cover material is added so that a clean layer of organic material covers the toilet contents at all times.

A lid is kept on the toilet receptacle when not in use. The lid need not be air-tight; a standard, hinged toilet seat is quite suitable. The lid does not necessarily prevent odor from escaping, and it does not necessarily prevent flies from gaining access to the toilet contents. Instead, the cover material does. The cover material acts as an organic lid or a biofilter; the physical lid or toilet seat is used primarily for convenience and aesthetics. Therefore, the choice of organic cover material is very important and a material that has some moisture content, such as rotted sawdust, works well. This is not kiln-dried sawdust from a carpenter shop. It is sawdust from a sawmill where trees are cut into boards. Such sawdust is both moist and biologically...
active and makes a very effective biofilter. Kiln-dried sawdust is too light and airy to be a 100% effective biofilter, unless partially rehydrated. Furthermore, kiln-dried sawdust from wood-working shops may contain hazardous chemical poisons if “pressure-treated” lumber is being used there.

During a cold winter, an outdoor pile of sawdust will freeze solid and should be covered or insulated in some manner. Otherwise, containers filled with sawdust stored in a basement will work as an alternative, as will peat moss and other cover materials stored indoors.

The system of using an organic cover material in a toilet receptacle works well enough in preventing odors to allow the toilet to be indoors, year round. In fact, a full receptacle with adequate and appropriate cover material, and no lid, can be set on the kitchen table without emitting unpleasant odors (take my word for it). An indoor humanure toilet should be designed to be as warm, cozy, pleasant and comfortable as possible. A well-lit, private room with a window, a standard toilet seat, a container of cover material and some reading material will suffice.

Full receptacles are carried to the composting area and deposited on the pile (you’ll know that a receptacle is full enough to empty when you have to stand up to take a shit). Since the material must be moved from the toilet room to an outdoor compost pile, the toilet room should be handy to an outside door. If you are designing a humanure toilet in a new home, situate the toilet room near a door that allows direct access to the outside.

It is best to dig a slight depression in the top center of the compost pile in the outdoor compost bin, then deposit the fresh toilet material there, in order to keep the incoming humanure in the hotter center of the pile. This is easily achieved by raking aside the cover material on top of the pile, depositing the toilet contents in the resulting depression, and then raking the cover material back over the fresh deposit. The area is then immediately covered with additional clean, bulky, organic material such as straw, leaves or weeds, in order to eliminate odors and to trap air as the pile is built.

The receptacle is then thoroughly scrubbed with a small quantity of water, which can be rain water or graywater, and biodegradable soap, if available. A long-handled toilet brush works well for this purpose. Often, a simple but thorough rinsing will be adequate. Rain water or wastewater is ideal for this purpose as its collection requires no electricity or technology. The soiled water is then
poured on the compost pile.

It is imperative that the rinse water not be allowed to pollute the environment. The best way to avoid this is to put the rinse water on the compost pile, as stated. However, the rinse water can be poured down a drain into a sewer or septic system, or drained into an artificial wetland. It can also be poured at the base of a tree or shrub that is designated for this purpose. Such a tree or shrub should have a thick layer of organic material — a biological sponge — at its base and be staked or fenced to prevent access by children or pets. Under no circumstances should the rinse water be flung aside nonchalantly. This can be a weak link in this simple humanure recycling chain and it provides the most likely opportunity for environmental contamination. Such contamination is easy to avoid through considerate, responsible management of the system. Finally, never use chlorine to rinse a compost receptacle. Chlorine is a chemical poison that is detrimental to the environment and is totally unnecessary for use in any humanure recycling system. Simple soap and water is adequate.

After rinsing or washing, the receptacle is then replaced in the toilet area. The inside of the receptacle should then be dusted with sawdust, the bottom should be primed with an inch or two of cover material, and the toilet is again ready for use. After about ten years, the plastic receptacle may begin to develop a nasty odor.

YARDS AND GARDENS: TRANSLATING AMERICAN INTO ENGLISH

In the United States, a “yard” is a grassy area surrounding a house; the term is equivalent to the English term “garden.” That grassy area may contain trees, shrubs or flowers. If it is located in front of the house, it is called the “front yard.” Behind the house, it is the “back yard.” Inside the house, it is the “side yard.” An American “garden” is a plot of vegetables, often located within the yard. An American garden can also be a flower garden or fruit garden; some American gardens contain flowers, fruits and vegetables. In the UK, the green area around a house is called the “garden,” whether it contains vegetables, flowers or nothing but mowed grass. English homes do not have “yards.” So the term “back yard composting,” translated to UK English, would be “back garden composting.”

HUMANURE TOILET STATISTICS

One hundred pounds of human body weight will fill approximately three gallons (.4 cubic feet, 693 cubic inches, or approximately 11 liters) in a humanure toilet per week - this volume includes the sawdust cover material. One hundred pounds of human body weight will also require approximately 3 gallons of semi-dry, deciduous, rotting sawdust per week for use as a cover material in a toilet. This amounts to a requirement of approximately 20 cubic feet of sawdust cover material per one hundred pounds of body weight per year for the proper functioning of a humanure toilet. Human excrement tends to add weight rather than volume to a humanure toilet as it is primarily liquid and fills the air spaces in the sawdust. Therefore, for every gallon of sawdust-covered excrement collected in a humanure toilet, nearly a gallon of cover material will need to be used.
$25 HUMANURE TOILET
WITH HINGED TOP

1. start with four identical receptacles
2. 2 hinges
3. 3/4' plywood 18'x18'
   3/4'x18'x3' board
4. 3/4'x3'x12'

(2) 3/4"x10'x18'
(2) 3/4"x10'x19.5'

(1) box is 10' deep,
18' wide and
21' long

3. Screw 3"x18" board to box. Leave 18"x18" plywood loose on hinges

4. Screw legs to inside of box. Receptacle MUST protrude through plywood by 1/2". Adjust legs accordingly.

5. Swivel plastic bumpers sideways so top of receptacle rim will fit against toilet seat.

6. adjusted toilet seat
Mark holes for toilet seat attachment.

A hinged humanure toilet box will be 18" wide by 21" long. Get two boards 3/4"x10"x18" and two 3/4"x10"x19.5". Get two hinges, one piece of 3/4"x18"x18" plywood and one 3/4"x3"x18". Hinge the plywood to the 3"x18" piece.

Cut a hole in the larger piece of plywood to fit the top of the 5 gallon receptacle. Set the hole only 1 & 1/2 inches back from the front edge of the plywood. Start with four identical receptacles so you have extras. Buy a standard toilet seat somewhere.

When screwing the legs to the inside of the box, make sure the top edge of the box will sit about 1/2" below the top edge of the receptacle (the top of the rim should protrude through the box by 1/2"). This allows the rim to sit tight against the underside of the toilet seat (which is why the toilet seat bumpers are pried loose and swiveled to one side, as shown in #5 and #6).

9. Attach your seat. Stain, varnish or paint the wood. You now have a compost toilet!
Figure 8.2
BUILT-IN HUMANURE TOILET WITH HINGED SEAT
The above diagram and photos below show a simple humanure toilet permanently built into a toilet room. The compost receptacle sits directly on the floor. A standard toilet seat is attached to an 18" square piece of plywood, which lifts on hinges to allow easy access when removing the compost material. Receptacle setback from the front edge of the plywood is 1.5". Top surface of plywood is 1/2" lower than top of receptacle rim allowing receptacle to protrude through cabinet to contact bottom of toilet seat ring. Plastic bumpers on bottom of toilet seat ring are swiveled sideways so as to fit around receptacle. Actual toilet shown below.
even after a thorough washing. Replace odorous receptacles with new ones in order to maintain an odor-free system. The old receptacles will lose their odor if left to soak in clean, soapy water for a lengthy period (perhaps weeks), rinsed, sun-dried and perhaps soaked again, after which they can be used for utility purposes (or, if you really have a shortage of receptacles, they can be used in the toilet again).

Here’s a helpful hint: when first establishing such a toilet system, it’s a good idea to acquire at least four five-gallon receptacles with lids, that are exactly the same, and more if you intend to compost for a large number of people. Use one under the toilet seat and the other three, with lids, set aside in the toilet room, empty and waiting. When the first becomes full, take it out of the toilet, put a lid on it, set it aside, and replace it with one of the empty ones. When the second one fills, take it out, put the other lid on it, set it aside, and replace it with the other empty one. Now you have two full compost receptacles, which can be emptied at your leisure, while the third is in place and ready to be used. This way, the time you spend emptying compost is cut in half, because it’s just as easy to carry two receptacles to the compost pile as one. Furthermore, you potentially have a 20-gallon toilet capacity at any one time instead of just five gallons. You may find that extra capacity to come in very handy when inundated with visitors.

Why should all of the receptacles be exactly the same? If you build a permanent toilet cabinet, the top of the receptacle should protrude through the cabinet to contact the bottom of a standard toilet seat. This ensures that all organic material goes into the container, not over its edge. Although this is not usually a problem, it can be with young children who may urinate over the top of a receptacle when sitting on a toilet. A good design will enable the receptacle to fit tightly through the toilet cabinet as shown in Figure 8.1. Since all plastic receptacles are slightly different in height and diameter, you should build your toilet cabinet to fit one size. You should have extra identical receptacles when backup capacity is needed to accommodate large numbers of people.

With enough containers, a humanure toilet system can be used for any number of people. If you’re using one in your home and you’re visited by thirty people all at once, you’ll be very happy to have empty containers ready to replace the ones that fill up. You will also be very happy that you will not have to empty any containers until after your company leaves, because you can simply set them out of the way, with lids, in the toilet room as they fill up, and then empty them.
FOR LATEST UPDATES — HUMANUREHANDBOOK.COM

Versions of this book have been in circulation around the world since late 1994. It has been translated and published in several languages in various countries. The latest, up-to-date developments, information and feedback are available on the internet at HumanureHandbook.com, including video clips of humanure composting, both in individual family situations and in group scenarios. There is also a public message board where humanure composters from around the world congregate, plus photos of owner-built humanure toilets and compost bins. You can purchase compost thermometers and humanure toilets already constructed. You can also read this book online and even download it for free, or send a link to others who may be interested in reading this material. Who knows what may be on the web by the time you read this. Google “humanure” and find out!
OPPOSITE PAGE: Humanure toilets made of recycled materials at a 2008 California festival provide the primary form of sanitation for 500 people (top left). Lines of odor-free humanure toilets (bottom) replace plastic chemical toilets. When a toilet receptacle is full, it is simply set outside, with a lid, for collection by “the humanure crew.” A full receptacle sits beside the passer-by. Instructions for “swapping out” toilet receptacles are clearly posted inside every toilet. The top, right, photo shows a group of pallet compost bins providing a place to compost humanure and food scraps collected at a 2008 New York conference.

THIS PAGE: A humanure toilet in a travel trailer allows collected toilet material to be later composted (above, left). A trailer load of rotted cedar sawdust (above, right) was used as toilet cover material with good results at a 2007 Texas conference. Below, a worker is “priming” cleaned toilet receptacles with rotted cedar sawdust at a 2008 festival before returning them to the toilets. Approximately 125 toilet receptacles, plus food scraps, were collected daily for 500 people and composted on site. This system requires a dedicated crew, a compost area with bins and cover material, clear instructions posted in each toilet, empty receptacles that can easily be swapped out to replace full ones, extra cover material available at every toilet, plus convenient hand washing stations. With a properly managed humanure system, large groups of people can gather and produce no sewage at all. Instead, they can produce compost, using odor-free, pleasant, sanitary toilet facilities.
Canadian toilet

Hawaiian toilet

use of old toilet tank for sawdust storage

Anonymous Reader-Contributed Photos of Owner-Built Humanure Toilets

The Humanure Handbook — Chapter 8: The Tao of Compost
commercial compost toilet converted to humanure toilet

Spanish toilet

Japanese toilet

Mexican toilet

roll-away toilet receptacle

The Humanure Handbook — Chapter 8: The Tao of Compost
DO’S AND DON'TS OF A THERMOPHILIC TOILET COMPOSTING SYSTEM

<table>
<thead>
<tr>
<th><strong>DO</strong></th>
<th><strong>DON'T</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Collect urine, feces, and toilet paper in the same toilet receptacle. Urine provides essential moisture and nitrogen.</td>
<td>Segregate urine or toilet paper from feces.</td>
</tr>
<tr>
<td>Keep a supply of clean, organic cover material handy to the toilet at all times. Rotting sawdust, peat moss, leaf mould, and other such cover materials prevent odor, absorb excess moisture, and balance the C/N ratio.</td>
<td>Turn the compost pile if it is being continuously added to and a batch is not available. Allow the active thermophilic layer in the upper part of the pile to remain undisturbed.</td>
</tr>
<tr>
<td>Deposit humanure into a depression in the top center of the compost pile, not around edges.</td>
<td>Use lime or wood ashes on the compost pile. Put these things directly on the soil.</td>
</tr>
<tr>
<td>Add a mix of organic materials to the humanure compost pile, including all food scraps.</td>
<td>Expect thermophilic activity until a sufficient mass has accumulated.</td>
</tr>
<tr>
<td>Keep the top of the compost pile somewhat flat. This allows the compost to absorb rainwater, and makes it easy to cover fresh material added to the pile.</td>
<td>Deposit anything smelly into a toilet or onto a compost pile without covering it with a clean cover material.</td>
</tr>
<tr>
<td>Use a compost thermometer to check for thermophilic activity. If your compost does not seem to be adequately heating, use the finished compost for berries, fruit trees, flowers, or ornamentals, rather than food crops. Or allow the constructed pile to age for two full years before garden use.</td>
<td>Allow dogs or other animals to disturb your compost pile. If you have problems with animals, install wire mesh or other suitable barriers around your compost, and underneath, if necessary.</td>
</tr>
<tr>
<td>Segregate food items from your humanure compost pile. Add all organic materials to the same compost bin.</td>
<td>Segregate food items from your humanure compost pile. Add all organic materials to the same compost bin.</td>
</tr>
<tr>
<td>Use the compost before it has fully aged. This means one year after the pile has been constructed, or two years if the humanure originated from a diseased population.</td>
<td>Worry about your compost. If it does not heat to your satisfaction, let it age for a prolonged period, then use it for horticultural purposes.</td>
</tr>
</tbody>
</table>

*The Humanure Handbook — Chapter 8: The Tao of Compost*
the next day.

Experience has shown that 150 people will require four five-gallon containers during a serious party. Therefore, always be prepared for the unexpected, and maintain a reserve toilet capacity at all times by having extra toilet receptacles available, as well as extra cover material. Incidentally, for every full container of compost material carried out of a toilet room, a full, same-sized container of cover material will need to be carried in. You cannot successfully use this sort of toilet without an adequate supply of appropriate cover material.

Expecting five hundred people for a major gathering out in the woods? Humanure toilets will work fine, as long as you keep enough receptacles handy, as well as adequate cover materials. With a system set up to compost the material and some volunteers to manage it all, you will collect a lot of valuable soil nutrients.

The advantages of a humanure toilet system include low financial start-up cost in the creation of the facilities, and low, or no energy consumption in its operation. Also, such a simple system, when the refuse is thermophilically composted, has a low environmental cost as little or no technology is required for the system’s operation and the finished compost is as nice and benign a material as humanure can ever hope to be. No composting facilities are necessary in or near one’s living space, although the toilet can and should be inside the living quarters and can be quite comfortably designed and totally odor-free.

No electricity is needed and no water is required except a small amount for cleaning purposes. One gallon of water can clean two five-gallon receptacles. It takes one adult two weeks to fill two five gallon toilet receptacles with humanure and urine, including cover material. This requires one gallon of cleaning water for every two weeks of humanure toilet use as opposed to the standard thirty gallons per person per day used to flush a water toilet.

The compost, if properly managed, will heat up sufficiently for sanitation to occur, thereby making it useful for gardening purposes. The composting process is fast, i.e., the humanure is converted quickly — within a few days if not frozen — into an inoffensive substance that will not attract flies. In cold winter months the compost may simply freeze until spring thaw, then heat up. If the compost is unmanaged and does not become thermophilic, the compost can simply be left to age for a couple of years before horticultural use. In either case, a complete natural cycle is maintained, unbroken.
A humanure toilet requires three components: 1) the toilet receptacle; 2) cover materials; and 3) a compost bin system. The system will not work without all three of these components. The toilet is only the collection stage of the process. Since the composting takes place away from the toilet, the compost bin system is important.

1) *Use at least a double-chambered, above-ground compost bin.* A three-chambered bin is recommended. Deposit in one chamber for a period of time (e.g., a year), then switch to another for an equal period of time.

2) *Deposit a good mix of organic material into the compost pile,* including kitchen scraps. It’s a good idea to put all of your organic material into the same compost bin. Pay no attention to those people who insist that humanure compost should be segregated from other compost. They are people who do not compost humanure and don’t know what they’re talking about.

3) *Always cover humanure deposits in the toilet with an organic cover material* such as sawdust, leaf mould, peat moss, rice hulls, ground newsprint, finely shredded paper or what have you. *Always cover fresh deposits on the compost pile with coarse cover materials* such as hay, weeds, straw, grass clippings, leaves or whatever is available. Make sure that enough cover material is applied so there is neither excess liquid build-up in the toilet nor offensive odors escaping either the toilet or the compost pile. The trick to using cover material is quite simple: *if it smells bad or looks bad, cover it until it does neither.*

4) *Keep good access to the pile* in order to rake the top somewhat flat, to apply bulky cover material when needed, to allow air access to the pile, and to monitor the temperature of the pile. The advantage of aerobic composting, as is typical of an above-ground pile, over relatively anaerobic composting typical of enclosed composting toilets, is that the aerobic compost will generate higher temperatures, thereby ensuring a more rapid and complete destruction of potential human pathogens.

The disadvantages of a collection system requiring the regular transporting of humanure to a compost pile are obvious. They include the inconvenience of: 1) carrying the material to the compost pile; 2) keeping a supply of organic cover material available and handy to the toilet; 3) maintaining and managing the compost pile itself. If one can handle these simple tasks, then one need never worry about having a functioning, environmentally friendly toilet.
NORMAL COMPOSTING BIN SEQUENCE

It’s very important to understand that two factors are involved in destroying potential pathogens in humanure. Along with heat, the time factor is important. Once the organic material in a compost pile has been heated by thermophilic microorganisms, it should be left to age or “season.” This part of the process allows for the final decomposition to take place, decomposition that may be dominated by fungi and macroorganisms such as earthworms and sowbugs. Therefore, a good compost system will utilize at least two composting bins, one to fill and leave to age, and another to fill while the first is aging. A three-binned composting system is even better, as the third bin provides a place to store cover materials, and separates the active bins so there is no possible accidental transfer of fresh material to an aging bin.

When composting humanure, fill one bin first. Make the bin floor slightly concave. Start the compost pile by establishing a thick layer of coarse and absorbent organic material on the bottom of the concave floor. This is called a “biological sponge.” Its purpose is to act as a leachate absorption barrier. The sponge may be an 18 inch or more layer of hay or straw, grass clippings, leaves, and/or weeds. Place the first container of the humanure/sawdust mix from the toilet directly on the top center of the sponge. Cover immediately with more straw, hay, weeds, or leaves — the cover acts as a natural “biofilter” for odor prevention, and it helps air to become trapped in the developing compost pile, making physical turning of the pile for aeration unnecessary. A standard bin size is about 5 feet square and 4 feet high (1.6 meters square and 1.3 meters high).

Continue in this manner until the bin is full, which is quite likely to take a year, being sure to add to this bin as much of the other organic material you produce as is practical. There is no need to have any other compost piles — one is enough for everything produced by the humans in your household. If you have small animals such as chickens or rabbits, their manure can go into the same compost pile. Small dead animals can also be added to the compost pile.

You need to do nothing special to prepare material for adding to the compost pile. You do not need to chop up vegetables, for example. Just chuck it all in there. Most of the things compost educators tell you cannot be composted can be composted in your humanure compost pile (such as meat, fats, oils, citrus fruits, animal mortalities, etc.). Add it all to the same compost pile. Anything smelly that may
HOW TO CONSTRUCT

THE HUMANURE HACIENDA

1. Dig 24" deep holes, drop in (8) 4x4 locust (or other suitable) posts, back fill with soil mixed with concrete. Posts are about 5’ (1.6 meters) apart. Leave four center posts high. Cut four outer posts to a height of about 4’.

2. Plumb and brace posts. Nail 4x4 header across higher center posts.

3. Screw 1” thick, rough sawn black locust (or other suitable) lumber to posts as shown. Leave small gap between boards and about 2” between bottom board and ground.

4. Cut rafters and install in a simple gable roof design. All the lumber for the roof can be recycled. The posts and side walls should be rot resistant lumber, but not lumber treated with toxic chemicals. It would be better to use scrap lumber for the sidewalls and replace it periodically than to use toxic lumber. The roofed center section will hold cover materials and will keep them dry, protected and unfrozen. The roof will also collect rain water, which should be used to clean compost buckets when not frozen.
5. Nail sheathing boards to roof rafters. Make sure rafter tails have plumb cuts so a fascia board can be attached.

6. Install fascia boards, then the finished roofing. Recycled slate makes an excellent roofing material.

7. Install the rain spouting. Install a rain barrel adjacent to the Hacienda. A recycled oak wine barrel is an excellent rainwater collector. Remember that you will have to drain the barrel during freezing weather.

The author’s Humanure Hacienda, shown at right, is expected to last a lifetime. The rainwater system makes cleaning compost buckets very convenient spring, summer and fall. The center roof also keeps bales of hay and straw dry and available for use throughout the winter.
THE CEASELESS CYCLE OF COMPOST MAKING

YEAR 1
Fill one side first.
center bin is for excess cover material storage
empty

YEAR 2
Allow to age.
Fill second side, let first side age and shrink.

END OF YEAR 2
Empty aged compost.
Allow second side to age.

YEAR 3
Start filling first side again. Let second side age and shrink.

If you want your compost to age for two years instead of one, add a fourth bin to the system. Turning the compost is not necessary (read Chapter 3). A roof over the center bin will keep the cover material dry and unfrozen in the winter months in cold climates (see figure 8.4).
attract flies should be dug into the top center of the pile. Keep a shovel or pitchfork handy for this purpose and use the tool only for the compost. Keep a clean cover material over the compost at all times and don’t let your compost pile become shaped like the Matterhorn — keep it somewhat flattened so nothing rolls off.

When you have a sudden large quantity of cover material available, such as an influx of grass clippings when the lawn is mowed, weeds from the garden, or leaves in the fall, place them in the center bin for storage and use them to cover humanure deposits as you need them. It is assumed that you do not use any poisonous chemicals on your lawn. If you do, bag the lawn clippings, take them to a toxic waste dump, and on the way, reflect upon the folly of such behavior. Do not put poisoned grass clippings in your compost pile.

Filling the first bin should take a year — that’s how long it takes us, a family, usually of four, with a lot of visitors. We have used this system for 30 continuous years at the time of this writing and every year at the summer solstice (on or about June 20th) we start a new compost pile. During March, April and May, the pile always looks like it is already full and can’t take any more material, but it always does. This is due to the constant shrinkage of the compost pile that takes place as summer approaches. When the pile is finally completed, it is covered over with a thick layer of straw, leaves, grass clippings or other clean material (without weed seeds) to insulate it and to act as a biofilter; then it is left to age (see photo, page 175).

At this time, the second bin is started, following the same procedure as the first — starting with a biological sponge and concave floor. When the second chamber is nearly full (a year later), the first one can begin to be emptied onto the garden, berries, orchard or flower beds. If you’re not comfortable using your compost for gardening purposes for whatever reason, use it for flowers, trees or berries.

A compost pile can accept a huge amount of refuse, and even though the pile may seem to be full, as soon as you turn your back it will shrink down and leave room for more material. One common concern among neophyte humanure composters is the pile looking like it’s filling up too fast. More than likely, the compost pile will keep taking the material as you add it because the pile is continually shrinking. If, for some reason, your compost pile does suddenly fill up and you have no where to deposit the compost material, then you will simply have to start a new compost bin. Four wooden pallets on edge will make a quick compost bin in an emergency.

The system outlined above will not yield any compost until

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two years after the process has started (one year to build the first pile and an additional year for it to age). However, after the initial two year start-up period, an ample amount of compost will be available on an annual basis.

What about leachate, or noxious liquids draining from the pile into the environment? First, compost requires a lot of moisture; evaporated moisture is one of the main reasons why compost shrinks so much. Compost piles are not inclined to drain moisture unless subjected to an excessive amount of rain. Most rainwater is absorbed by the compost, but in heavy rainfall areas a roof or cover can be placed over the compost pile at appropriate times in order to prevent leaching. This roof can be as simple as a piece of plastic or a tarp. Second, a thick biological sponge should be layered under the compost before the pile is built. This acts as a leachate barrier.

If these two factors aren’t effective enough, it would be a simple matter to place a layer of plastic underneath the compost pile, under the biological sponge, before the pile is built. Fold the plastic so that it collects any leachate and drains into a sunken five gallon bucket. If leachate collects in the bucket, pour it back over the compost pile. The interface between the compost pile and the soil acts as a corridor for soil organisms to enter the compost pile, however, and plastic will prevent that natural migration. Nevertheless, the plastic can provide simple and effective leachate prevention, if needed.
Fecophobes, as we have seen throughout this book, believe that all human excrement is extremely dangerous and will cause the end of the world as we know it if not immediately flushed down a toilet. Some insist that humanure compost piles must be turned frequently — to ensure that all parts of the pile are subjected to the internal high temperatures.

The only problem with that idea is that most people produce organic refuse a little at a time. For example, most people defecate once a day. A large amount of organic material suitable for thermophilic composting is therefore usually not available to the average person. As such, we who make compost a daily and normal part of our lives tend to be “continuous composters.” We add organic material continuously to a compost pile, and almost never have a large “batch” that can be flipped and turned all at once. In fact, a continuous compost pile will have a thermophilic layer, which will be located usually in the top two feet or so of the pile. If you turn the compost pile under these conditions, that layer will become smothered by the thermophilically “spent” bottom of the pile, and all thermophilic activity will grind to a halt.

In healthy human populations, therefore, turning a continuous compost pile is not recommended. Instead, all humanure deposits should be deposited in the top center of the compost pile in order to feed it to the hot area of the compost, and a thick layer of insulating material (e.g., hay) should be maintained over the composting mass. Persons who have doubts about the hygienic safety of their finished humanure compost are urged to either use the compost for non-food crops or orchards, or have it tested at a lab before using on food crops.

On the other hand, one may have the need to compost humanure from a population with known disease problems. If the organic material is available in batches, then it can be turned frequently during the thermophilic stage, if desired, in order to enhance pathogen death. After the thermophilic stage, the compost can be left to age for at least a year. Refer to Chapter 3 for more information on turning compost piles.

If the organic material from a diseased population is available only on a continuous basis, and turning the pile, therefore, is counterproductive, an additional year-long curing period is recommended. This will require one more composting bin in addition to the two
already in use. After the first is filled (presumably for a year), it is left to rest for two years. The second is filled during the second year, then it is left to rest for two years. The third is filled during the third year. By the time the third is filled, the first has aged for two years and should be pathogen-free and ready for agricultural use. This system will create an initial lag-time of three years before compost is available for agricultural purposes (one year to build the first pile, and two more years retention time), but the extra year's retention time will provide added insurance against lingering pathogens. After the third year, finished compost will be available on a yearly basis. Again, if in doubt, either test the compost for pathogens in a laboratory, or use it agriculturally where it will not come in contact with food crops.

ANALYSES

After 14 years of humanure composting I analyzed my garden soil, my yard soil (for comparison), and my compost, each for fertility and pH, using LaMotte test kits from the local university. I also sent samples of my feces to a local hospital lab to be analyzed for indicator parasitic ova or worms. That was back in 1993.

The humanure compost proved to be adequate in nitrogen (N), rich in phosphorus (P) and potassium (K), and higher than either the garden or the yard soil in these constituents as well as in various beneficial minerals. The pH of the compost was 7.4 (slightly alkaline), but no lime or wood ashes had been added during the composting process. This is one reason why I don't recommend adding...
lime (which raises the pH) to a compost pile. A finished compost would ideally have a pH around, or slightly above, 7 (neutral).

The garden soil was slightly lower in nutrients (N, P, K) than the compost, and the pH was also slightly lower at 7.2. I had added lime and wood ashes to my garden soil over the years, which may explain why it was slightly alkaline. The garden soil, however, was still significantly higher in nutrients and pH than the yard soil (pH of 6.2), which remained generally poor.

My stool sample was free of pathogenic ova or parasites. I used my own stool for analysis purposes because I had been exposed to the compost system and the garden soil longer than anyone else in my family by a number of years. I had freely handled the compost, with bare hands, year after year, with no reservations. I repeated the stool analysis a year later, after 15 years of exposure, then 11 years later, after 26 years of exposure, again with negative results. Hundreds of people had used my compost toilet over the years, prior to these tests.

These results indicate that humanure compost is a good soil builder, and that no intestinal parasites were transmitted from the compost to the compost handler after 26 years of continuous, unrestricted use in the United States.

Over the entire 26-year period, most of the humanure compost my family has produced has been used in our food garden. We have raised a lot of food with that compost, and a crop of lovely and healthy children with that food.

Some may surmise that the Ova & Parasite lab analyses I had done were pointless. They didn’t prove anything because there may not have been any contamination by intestinal parasites in the compost to begin with. If, after 26 years and literally hundreds of users, no such contaminants made their way into my compost, then that’s important information. This suggests that the fears of humanure compost are grossly overblown. The point is that my compost has not created any health problems for me or my family, and that’s a very important point, one that the fecophobes should take note of.

**MONITORING COMPOST TEMPERATURE**

Back in 1993 I charted the temperature of my thawing spring compost piles for two years in a row. Over the winter, the compost had frozen solid as a shitcicle and I wanted to see what was happening after the piles thawed out. The compost consisted primarily of
deposits from the humanure toilet, which contained hardwood sawdust, humanure including all urine, and toilet paper. In addition to this material, kitchen food scraps were added to the pile intermittently throughout the winter, and hay was used to cover the toilet deposits on the pile. Some weeds and leaves were added now and then.

The material was continuously collected from a family of four. Nothing special was done to the pile at any time. No unusual ingredients were added, no compost starters, no water, no animal manures other than human (although a little chicken manure was added to the pile charted on the right, which may explain the higher composting temperatures). No turning was done whatsoever. The compost piles were situated in a three-sided, open-topped wooden

Figure 8.7
TEMPERATURE CURVES OF FROZEN HUMANURE COMPOST PILES, AT 8” AND 20” DEPTHS, AFTER SPRING THAW

The above compost piles were situated outdoors, in wooden bins, on bare soil. The compost was unturned and not manually aerated in any way. No compost starters were used. Ingredients included humanure, urine, food scraps, hay, weeds, and leaves (and some chicken manure on the 1994 compost). The compost was frozen solid through the winter, but exhibited the above temperature climb after thawing in the spring. Fresh material was added to the compost pile regularly while these temperatures were being recorded on unmoved thermometers. The hot area of the compost pile remained in the upper section of the compost as the pile continued to be built during the following summer. In the fall, the entire compost pile cooled down, finally freezing and becoming dormant until the following spring, when it regained consciousness and heated again. It is evident that the internal heat of a compost pile is relatively independent of the ambient temperatures as the heat is generated by internal microbiological activity, not outside air temperature.
bin on bare soil, outdoors. The only imported materials were raw sawdust, a locally abundant resource, and hay from a neighboring farm (less than two bales were used during the entire winter).

Two thermometers were used to monitor the temperature of this compost, one having an 8” probe, the other having a 20” probe. The outside of the pile (8” depth) shown on the left graph was heated by thermophilic activity before the inside (20” depth). The outside thawed first, so it started to heat first. Soon thereafter, the inside thawed and also heated. By April 8th, the outer part of the pile had reached 50°C (122°F) and the temperature remained at that level or above until April 22nd (a two-week period). The inside of the pile reached 122°F on April 16th, over a week later than the outside, and remained there or above until April 23rd. The pile shown in the right graph was above 122°C for 25 days.

Since 1993, I have monitored my humanure compost temperatures continuously, year round. The compost typically reaches 120 degrees F (49°C), at a depth of 20”, in early spring and now stays there all summer and fall. In the winter, the temperature drops, but the compost piles have not frozen since 1997. In fact, the compost thermophiles seem to be adapting to the cold winters of Pennsylvania and it is not uncommon for my compost to read temperatures over 100 degrees F all winter long, even when the ambient air temperature is in the single digits. The maximum temperature I have recorded is about 149 degrees F (65°C), but more typical temperatures range from 110°F (44°C) to 130°F (54°C). For some reason, the compost seems to stay around 120°F most of the summer months (at a depth of 20”).

According to Dr. T. Gibson, Head of the Department of Agricultural Biology at the Edinburgh and East of Scotland College of Agriculture, “All the evidence shows that a few hours at 120 degrees Fahrenheit would eliminate [pathogenic microorganisms] completely. There should be a wide margin of safety if that temperature were maintained for 24 hours.”

Incidentally, I am writing this paragraph on February 24, 2005. I emptied four humanure compost receptacles this morning before I started writing. The outdoor temperature was 22 degrees F. The compost temperature at 20” depth was just over 100 degrees F. I glanced at the clock before I started emptying the compost, then again after I had finished and washed my hands. Exactly fifteen minutes had elapsed. This is a weekly chore and more time consuming in the winter because a gallon jug of water has to be carried out with the compost in order to rinse the containers (the rain barrel at the
Humanure Hacienda is drained during the winter months and no water is available there). I have never paid much attention to how time-consuming (or not) humanure composting can be, so I was surprised that it took only fifteen minutes to empty four receptacles at a leisurely pace during the worst time of year.

I shouldn’t be surprised, though, because we’ve developed an efficient system over the years — we use a four-receptacle system because two receptacles are easier to carry than one, and four receptacles will last approximately one week for a family of four, which means only emptying compost on a weekly basis. In the winter, one gallon of water is required for rinsing purposes for every two compost receptacles. That means four people will need 1/2 gallon of water each per week for toilet use, requiring about four minutes per person per week for compost emptying.

Granted, there is additional time required to acquire and stockpile cover materials — a job usually done in the summer or fall (we go through about ten bales of straw or hay each year, plus a pick-up truck load of sawdust). A few minutes each week are also needed to refill cover material containers in the toilet room (in our household this is usually a job for the kids). The biggest task is wheelbarrowing the compost to the garden each spring. But then, that’s the whole idea — making compost.

FECOFRIGGINFOBIA

There seems to be an irrational fear among fecophobes that if you don’t die instantly from humanure compost, you’ll die a slow, miserable death, or you’ll surely cause an epidemic of the plague and everyone within 200 miles of you will drop like flies, or you’ll become so infested with parasitic worms that your head will look like spaghetti.

These fears exist perhaps because much of the information in print concerning the recycling of humanure is confusing, erroneous, or incomplete. For example, when researching the literature during the preparation of this book, I found it surprising that almost no mention is ever made of the thermophilic composting of humanure as a viable alternative to other forms of on-site sanitation. When “bucket” systems are mentioned, they are also called “cartage” systems and are universally decried as being the least desirable sanitation alternative.

For example, in *A Guide to the Development of On-Site Sanitation*
Sanitation by Franceys et al., published by the World Health Organization in 1992, “bucket latrines” are described as “malodorous, creating a fly nuisance, a danger to the health of those who collect or use the nightsoil, and the collection is environmentally and physically undesirable.” This sentiment is echoed in Rybczynski’s (et al.) World Bank funded work on low-cost sanitation options, where it is stated that “the limitations of the bucket latrine include the frequent collection visits required to empty the small container of [humanure], as well as the difficulty of restricting the passage of flies and odors from the bucket.”

I’ve personally used a humanure toilet for 30 years and it has never caused odor problems, fly problems, health problems, or environmental problems. Quite the contrary, it has actually enhanced my health, the health of my family, and the health of my environment by producing healthy, organic food in my garden, and by keeping human waste out of the water table. Nevertheless, Franceys et al. go on to say that “[humanure] collection should never be considered as an option for sanitation improvement programmes, and all existing bucket latrines should be replaced as soon as possible.”

Obviously Franceys et al. are referring to the practice of collecting humanure in buckets without a cover material (which would surely stink to high heaven and attract flies) and without any intention of composting the humanure. Such buckets of feces and urine are presumably dumped raw into the environment. Naturally, such a practice should be strongly discouraged, if not outlawed.

However, rather than forcing people who use such crude waste disposal methods to switch to other more prohibitively costly waste disposal methods, perhaps it would be better to educate those people about resource recovery, the human nutrient cycle and about composting. It would be more constructive to help them acquire adequate and appropriate cover materials for their toilets, assist them in constructing compost bins, and thereby eliminate waste, pollution, odor, flies and health hazards altogether. I find it inconceivable that intelligent, educated scientists who observe bucket latrines and the odors and flies associated with them do not see that the simple addition of a clean, organic cover material to the system would solve the aforementioned problems, and balance the nitrogen of the humanure with carbon.

Franceys et al. state, however, in their book, that “apart from storage in double pit latrines, the most appropriate treatment for on-site sanitation is composting.” I would agree that composting, when done properly, is the most appropriate method of on-site sanitation available to

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THE HUMANURE TOILET ON CAMPING TRIPS

Humanure composters have tricks up their sleeves. Ever go on a week-long camping trip or to a camping music festival and hate using those awful portable chemical toilets that stink? If you have a humanure compost bin at home, simply take two five gallon receptacles with you on the trip. Fill one with a cover material, such as sawdust, and put a lid on it. Set it inside the empty receptacle and pack it along with your other camping gear. Voila! One portable composting toilet! When you set up your camp, string up a tarp for privacy and set the two containers in the private space. Use the empty container as a toilet, and use the cover material to keep it covered. Place a lid on it when not in use. No standing in line, no odors, no chemicals, no pollution. This toilet will last several days for two people. When you leave the camp, take the “soil nutrients” home with you and add them to your compost pile. You will probably be the only campers there who didn’t leave anything behind, a little detail that you can be proud of. And the organic material you collected will add another tomato plant or blueberry bush to your garden. You can improve on this system by taking a toilet seat that clamps on a five gallon container, or even taking along a home-made toilet box with a seat.

A SIMPLE URINAL

Want to collect urine only? Maybe you want a urinal in a private office, bedroom or shop. Simply fill a five-gallon receptacle with rotted sawdust or other suitable material, and put a tight lid on it. A receptacle full of sawdust will still have enough air space to hold about a week’s worth of urine from one adult. Urinate into the receptacle and replace the lid when not in use. For a fancy urinal, place the sawdust bucket in a toilet cabinet with a regular toilet seat. When the receptacle is full, deposit it on your compost pile. The sawdust inhibits odors and balances the nitrogen in the urine. It beats the frequent trips to a central toilet room that coffee drinkers are inclined to make, and no “soil nutrients” are going to waste down a drain.

WHY NOT PLACE THE COMPOST BINS DIRECTLY UNDERNEATH THE TOILET?

The thought of carrying containers of humanure to a compost bin can deter even the most dedicated recycler. What if you could situate your toilet directly over your compost bins? Here’s some reader feedback:

FEEDBACK

“I finally write back to you after 2 1/2 years of excitingly successful and inspiring use of humanure methods applied to a ‘direct shitter’ compost. We indeed built a beautiful humanure receptacle 10 feet long, 4 feet high and 5 feet wide, divided into two chambers. One chamber was used (sawdust after every shit, frequent green grass and regular dry hay applications) from May 1996 until June 1997, then nailed shut. We moved to the second chamber until June 1998 — when with excitement mounting, we unscrewed the boards at the back of the “Temple of Turds” (our local appellation) and sniffed the aroma...of the most gorgeous, chocolate brownie, crumbly compost ever SEEN. Yes, I thrust my hands fully into the heavenly honey pot of sweet soil, which soon thereafter graced the foundations of our new raspberry bed. Needless to say, the resulting berries knew no equal. Humanure and the potential for large-scale... even a city size composting collection (apartment building toilets into a central collection dumpster), along with the crimes of the so-called “septic system,” has become one of my most favored topics of conversation and promotion. Often through direct exposition at our farm. Many thanks for your noble work of art and contribution to this stinky species of ape.”  R.T. in CT
“People are saying that the Year 2000 computer problem could foul up a lot of stuff we usually depend on, all at once. I thought I’d give this Y2K Practice Day a try. Turn off the heat, lights, water and phones. Just for 24 hours. The day before Practice Day, I complained to Larry, telling him that I was bitterly disappointed not to try out an emergency toilet. This complaining really paid off. Larry, who’s also a writer researching Year 2000 emergency preparedness, phoned a man named Joe Jenkins, author of a book called the Humanure Handbook. Joe reassured my husband of the safe, sanitary, and uncomplicated method for composting human waste. His solution is based on 20 years of scholarly study. It turns out that the thermophilic bacteria in human waste, when mixed with organic material like peat moss or sawdust, creates temperatures over 120 degrees Fahrenheit, rapidly killing pathogens just as Mother Nature intended.

We grew bold and daring and decided to use our emergency five gallon toilet receptacle with the toilet seat, layering everything with peat moss. Larry spent maybe a half hour building a special compost bin. This was right up his alley, since he already composes all the kitchen scraps, yard, and dog wastes.

Surprisingly, I found myself liking that little toilet. It was comfortable, clean, with no odor, just a slightly earthy smell of peat moss. The soul-searching came when I contemplated going back to the flush toilet.

By coincidence, I recently heard a presentation by the director of the local waste treatment facility. He was asked to address the issue of Year 2000 disruptions and explain what preparations were being made. In a matter-of-fact voice, he described what a visitor from another planet would undoubtedly consider a barbaric custom. First, we defecate and urinate in our own clean drinking water. In our town, we have 800 miles of sewers that pipe this effluent to a treatment facility where they remove what are euphemistically called solids. Then they do a bunch more stuff to the water, I forget exactly what. But I do remember that at one point, they dose it with a potent poison — chlorine, of course — and then they do their best to remove the chlorine. When all this is done, the liquid gushes into the Spokane River.

At this meeting was a man named Keith who lives on the shores of Long Lake, down river from us. Keith was quite interested to know what might occur if our sewage treatment process was interrupted. The waste treatment official assured him that all would be well, but I couldn’t help reflecting that Keith might end up drinking water that we had been flushing. I like Keith. So I decided to keep on using my camp toilet.

My husband is a passionate organic gardener, at his happiest with a shovel in his hand, and he’s already coveting the new compost. He’s even wondering if the neighbors might consider making a contribution. I’m just grateful the kids are grown and moved out, because they’d have a thing or two to say.”

Judy Laddon in WA (excerpted with permission)
humans. I would not agree that double pit storage is more appropriate than thermophilic composting unless it could be proven that human pathogens could be adequately destroyed using such a double pit system, and that such a system would be comfortable and convenient, would produce no unpleasant odor and would not require the segregation of urine from feces. According to Rybczynski, the double pit latrine shows a reduction of *Ascaris* ova of 85% after two months, a statistic which does not impress me. When my compost is finished, I don't want *any* pathogen threat lurking in it.

Ironically, the work of Franceys et al. further illustrates a "decision tree for selection of sanitation" that indicates the use of a "compost latrine" as being one of the least desirable sanitation methods, and one which can only be used if the user is willing to collect urine separately. Unfortunately, contemporary professional literature is rife with this sort of inconsistent, incomplete and incorrect information which would surely lead a reader to believe that composting humanure just isn't worth the trouble.
On the other hand, Hugh Flatt, who, I would guess, is a practitioner and not a scientist, in *Practical Self-Sufficiency* tells of a humanure toilet system he had used for decades. He lived on a farm for more than 30 years which made use of “bucket lavatories.” The lavatories serviced a number of visitors during the year and often two families in the farmhouse, but they used no chemicals. They used sawdust, which Mr. Flatt described as “absorbent and sweet-smelling.” The deciduous sawdust was added after each use of the toilet, and the toilet was emptied on the compost pile daily. The compost heap was located on a soil base, the deposits were covered each time they were added to the heap, and kitchen refuse was added to the pile (as was straw). The result was “a fresh-smelling, friable, biologically active compost ready to be spread on the garden.”

Perhaps the “experts” will one day understand, accept and advocate simple humanure composting techniques such as the humanure toilet. However, we may have to wait until Composting 101 is taught at universities, which may occur shortly after hell freezes over. In the meantime, those of us who use simple humanure composting methods must view the comments of today’s so-called experts with a mixture of amusement and chagrin. Consider, for example, the following comments posted on the internet by another “expert.” A reader posted a query on a compost toilet forum website wondering if anyone had any scientific criticism about the above-mentioned humanure toilet system. The expert replied that he was about to publish a new book on composting toilets, and he offered the following excerpt:

“Warning: Though powerfully appealing in its logic and simplicity, I’d expect this system to have an especially large spread between its theoretical and its practical effectiveness. If you don’t have a consistent track record of maintaining high temperatures in quick compost piles, I’d counsel against using this system. Even among gardeners, only a small minority assemble compost piles which consistently attain the necessary high temperatures . . . Health issues I’d be concerned about are 1) bugs and small critters fleeing the high-temperature areas of the pile and carrying a coat of pathogen laden feces out of the pile with them; 2) large critters (dogs, raccoons, rats . . .) raiding the pile for food and tracking raw waste away; and 3) the inevitable direct exposure from carrying, emptying, and washing buckets.

Some clever and open-minded folk have hit on the inspiration of composting feces . . . by adding them to their compost piles! What a revolutionary concept! . . . Sound too good to be true? Well, in theory it is true, though in practice I believe that few folks would pass
FREQUENTLY ASKED QUESTIONS ABOUT HUMANURE TOILETS

• Should a humanure toilet be inside or outside? Inside. It is much more comfortable during cold and wet weather. The contents of an outside toilet will freeze in the winter and will be very difficult to empty into the compost bin. Keep a clean layer of sawdust over the toilet contents at all times and you won’t have any odor inside.

• Can the humanure toilet receptacle be left for long periods without emptying? The toilet receptacle can sit for months without emptying. Just keep a clean layer of sawdust or other cover material over the contents.

• Will the toilet material compost inside the toilet receptacle? No. It will not start to compost in the toilet receptacle. It won’t start composting until you put it in your compost pile.

• How full should the humanure toilet receptacle be before it’s emptied? You know it’s time to empty the toilet when you have to stand up to take a shit.

• Why doesn’t the toilet smell bad? The adequate amount of the correct cover material will allow for an odor-free system. Therefore, a humanure toilet can be used almost anywhere, such as in an office or bedroom. If you don’t cover the toilet contents, it will stink like hell.

• Will my outdoor compost bin smell bad and cause complaints? Absolutely. If you don’t keep a layer of cover material on the active compost bin it will stink like hell and your neighbors will have you tarred and feathered, and they should. If you detect odor emanating from your pile, add cover material until it stops.

• Why won’t the compost pile leach pollutants? Start your pile on a concave surface with a biological sponge underneath it to prevent leachate during the early stages of the compost pile. A hot compost pile craves moisture — liquids don’t leach from it, unless it’s a monsoon.

• Should a compost pile be separated from the earth by a waterproof barrier to prevent leaching? Not necessarily. However, you can put a sheet of plastic under your compost and arrange it to drain into a sunken bucket if leaching is a concern. Any leachate collected can be poured back over the compost pile. Leachate is typically not a problem, however.

• What sort of seal should I use around the toilet seat lid? You don’t need a seal around the toilet seat lid. The “seal” is created by the organic material that covers the humanure.

• Can I use wood chips in my compost? What else? Don’t use wood chips or wood shavings. Chips are bad; shavings will compost, but they take a long time and don’t make good compost. They’re lousy in a toilet because it takes a lot of them to mask odor and then they throw the carbon/nitrogen ratio off balance and your compost won’t heat up. Use a finer material in your toilet. Use hay, straw, weeds, leaves, grass clippings, etc. on your pile. Not wood chips.

• When I empty the contents of several toilet receptacles at once, should I cover each one separately with a bulk cover material so as to trap air in the compost pile? No. Air is already trapped in the sawdust. When emptying several toilet receptacles at once, just empty them into a depression in the top, center of the pile, then cover. One mistake people make is thinking they need to create a layered pile for aeration purposes. In fact, if you layer too much cover material into the pile, it may become too dry and not heat up at all. Although there needs to be oxygen in the pile, there also needs to be a lot of moisture.

• What about winter composting? Can I add to a snow-covered compost pile? You can deposit compost materials on top of the snow. The main problem in the winter is the cover material freezing. So you need to cover your leaves, sawdust, hay, or whatever you use so they don’t freeze. You can throw a tarp over an outdoor pile of sawdust, then cover that with a thick layer of straw, for example. Or you can bring sawdust indoors in a wheele bin (plastic garbage can) during the winter, too. That works pretty well.

• Does a compost bin need to have an open side? Shouldn’t a bin be enclosed in an urban situation? You don’t need an open side. Someone wrote from Manhattan who had installed humanure toilets in a communal home, and he made a four sided bin (one side removable) with a heavy screen top to keep out anything that might want to try to get in (like flies, rats, skunks, snakes or politicians). That seemed like a good idea for a city situation (a screen bottom may be necessary too). Wrap your bins in chicken wire if animals are a problem.

• Where do you keep your sawdust? I can’t seem to decide where to store it. I have lots of outdoor space so I have a dump truck bring me a load of sawdust every few years and dump it
out by my compost bins. If I didn’t have that option, I might try using peat moss, which is handily packaged and could be kept indoors, or store sawdust indoors in feed sacks or wheelie bins, or use a three-chambered compost bin and put the sawdust in the center.

• How do I know the edges of the compost pile will get hot enough to kill all pathogens? You will never be absolutely certain that every tiny bit of your compost has been subjected to certain temperatures, no matter what you do. If in doubt, let it age for an additional year, have it tested at a lab, or use the compost on non-food crops.

• Can I build my compost bin under my house and defecate directly into it? Yes, but I have never tried this and can’t personally vouch for it. You may have odor issues.

• What about meat and dairy products in compost? They’ll compost. Dig them into the top center of the pile, and keep it all covered with a clean, organic material.

• What about building codes, septic permits, and other government regulations? Some composters are inclined to believe that government bureaucrats are against composting toilets. This is more paranoia than truth. Alternative solutions are becoming more attractive as the sewage issue continues to get worse. Government agencies are looking for alternative solutions that work, and they are willing to try new things. Their concerns are legitimate, and change comes slowly in government. If you work cooperatively with your local authority, you may both be satisfied in the end.

• What about flies and rats in the compost? Flies won’t be a problem if the compost is adequately covered. If you have rats, you may have to envelope your compost bin in wire mesh if you can’t get rid of them.

• Can I use softwood sawdust in my compost? Yes. Make sure it’s not from “pressure treated” lumber. The sawdust can be moist, but shouldn’t be wet. If using cedar, redwood, or other rot-resistant sawdust, make sure it is well rotted (aged) outdoors first.

• What about using railroad ties to make compost bins? The creosote is not good for your compost, so railroad ties are not recommended.

• What about using dog doo in compost? Use a separate compost bin because many pets are not healthy and pass visible parasites, such as tapeworms, in their stools. Use a cover material, and let the compost age a year or two. Same for cats. Grow flowers with the compost.

• What about coffee filters and barbecue ashes? Throw coffee filters in your compost. Grounds, too, and even old coffee. Tea bags too. Barbecue ashes? Maybe throw them in with the dog doo. Use that compost for non-food plants.

• If I don’t want to start using humanure in my compost now, could I do it on short notice in the event of a municipal emergency? In the event of a serious municipal emergency, you could immediately begin composting humanure, as long as you had a source of clean cover material (sawdust, leaves, etc.) and a compost bin. Compost piles work much better when you feed them manure and urine and other nitrogen sources such as grass clippings and greenery. You may find that humanure and urine greatly improve your compost.

• What is the hottest temperature you have recorded in your compost? Can it get too hot? About 65 degrees Celsius (150°F). Yes, it can get too hot (see Chapter 3). A cooler pile over a longer period is ideal. It’s more likely your compost won’t get hot enough. This is often due either to a dry pile (make sure you collect and compost all urine), the use of wood chips or shavings (do not use wood chips or shavings — use sawdust), or the excessive use of layered cover material (you do not have to layer cover material into the pile — keep the cover material on top and around the edges; enough will infiltrate the pile without having to consciously layer it.

• Can you compost humanure with a large family? Would it be too labor intensive? For a family of 6-10, depending on body weight, a five gallon compost toilet receptacle would fill daily. A bigger concern would be the supply of organic cover material, which would amount to about five gallons of volume daily also. You would need several compost bins and a place to put them.

• What about composting on a flood plain? Would a pit latrine work better? Don’t compost on a flood plain. Don’t use a pit latrine. Pit latrines are illegal because they cause pollution.

• What are some other compost bin designs? One design consists of two concentric wire bins with leaves stuffed in between and the humanure going into the center. Another is a bin composed entirely of straw or hay bales. Another design consists of simple wooden pallets arranged on their sides and tied or screwed together to form compost bins.

• Do you recommend using chlorine bleach as a disinfectant? No. It’s an environmental contaminant. Try hydrogen peroxide or just use soap and water.
all the little hurdles along the way to realizing these benefits. Not because any part of it is so difficult, just that, well, if you never ate sugar and brushed and flossed after every meal, you won’t get cavities either.” 4

Sound a bit cynical? The above comments are entirely lacking in scientific merit and expose an “expert” who has no experience whatsoever about the subject on which he is commenting. It is disheartening that such opinions would actually be published, but not surprising. The writer hits upon certain knee-jerk fears of fecophobes. His comment on bugs and critters fleeing the compost pile coated with pathogen-laden feces is a perfect example. It would presumably be a bad idea to inform this fellow that fecal material is a product of his body, and that if it is laden with pathogens, he’s in very bad shape. Furthermore, there is some fecal material probably inside him at any given moment. Imagine that — pathogen-infested fecal material brimming with disease-causing organisms actually sitting in the man’s bowels. How can he survive?

When one lives with a humanure composting system for an extended period of time, one understands that fecal material comes from one’s body, and exists inside oneself at all times. With such an understanding, it would be hard to be fearful of one’s own humanure, and impossible to see it as a substance brimming with disease organisms, unless, of course, oneself is brimming with disease.

The writer hits upon another irrational fear — large animals, including rats, invading a compost pile and spreading disease all over creation. Compost bins are easily built to be animal-proof. If small animals such as rats are a problem, the compost bin can be lined with chicken wire on all sides and underneath. The compost bins should have side walls such as pallets, straw bales, wood boards, or similar barriers to keep out dogs. A simple piece of wire fencing cut to fit the exposed top of the active compost pile will keep all animals from digging into it while allowing rain water to keep the pile moist.

The writer warns that most gardeners do not have thermophilic compost. Most gardeners also leave critical ingredients out of their compost, thanks to the fear-mongering of the ill-informed. Those ingredients are humanure and urine, which are quite likely to make one’s compost thermophilic. Commercial composting toilets almost never become thermophilic. As we have seen, it is not only the temperature of the compost that destroys pathogens, it is retention time. The humanure toilet compost requires a year’s construction time, and another year’s undisturbed retention time. When a ther-
mophilic phase is added to this process, I would challenge anyone to come up with a more effective, earth-friendly, simpler, low-cost system for pathogen destruction.

Finally, the writer warns of “the inevitable direct exposure from carrying, emptying and washing buckets.” I’m not sure what he’s getting at here, as I have carried, emptied and washed toilet receptacles for decades and never had a problem. Wiping one’s butt after defecating requires more “direct exposure” than emptying compost, but I would not discourage people from doing it. It is quite simple to wash one’s hands after defecating and after taking care of the compost, and as you can see, it’s quite easy to get carried away with a frothing-at-the-mouth fecophobic frenzy.

Other recent experts have thrown in their two cents worth on the humanure toilet. A book on composting toilets mentions the humanure toilet system. Although the comments are not at all cynical and are meant to be informative, a bit of misinformation manages to come through. For example, the suggestion to use “rubber gloves and perhaps a transparent face mask so you do not get anything splashed on you” when emptying a compost receptacle onto a compost pile, caused groans and a lot of eyes to roll when read aloud to seasoned humanure composters. Why not just wear an EPA approved moon suit and carry the compost receptacle at the end of a ten-foot pole? How is it that what has just emerged from one’s body can be considered so utterly toxic? Can one not empty a container into a compost pile without splashing the contents all over one’s face? More exaggeration and misinformation existed in the book regarding temperature levels and compost bin techniques. One warning to “bury finished compost in a shallow hole or trench around the roots of nonedible plants,” was classic fecophobia. Apparently, humanure compost is to be banned from human food production. The authors recommended that humanure compost be composted again in a non-humanure compost pile, or micro-waved for pasteurization, both bizarre suggestions. They add, “Your health agent and your neighbors may not care for this [humanure toilet composting] method.”

I have to scratch my head and wonder why the “experts” would say this sort of thing. Apparently, the act of composting one’s own humanure is so radical and even revolutionary to the people who have spent their lives trying to dispose of the substance, that they can’t quite come to grips with the idea. Ironically, a very simple humanure toilet used by a physician and his family in Oregon is featured and illustrated in the above book. The physician states, “There is no offen-
Humanure is added to the author’s compost bin, above, observed by Kathleen Meyer, author of *How to Shit in the Woods*. The humanure is deposited into the center of the pile while a thick layer of cover material remains around the outside edges. The deposit is covered immediately afterward. The toilet receptacle is then scrubbed and the rinse water poured into the pile. The compost bin is filled for a year, then allowed to age for a year. Below, the aged compost is applied to the spring garden. Photos by author except above, by Jeanine Jenkins.
The human nutrient cycle is completed by returning the household organic material to the soil in order to grow food for people. The author’s garden is further amended with grass clipping mulch, a little annual chicken manure, and leaf mulch in the fall. It is located immediately adjacent to the home as can be seen in the photo on the opposite page. The author’s daughter, shown in the same garden at different ages, has grown up with healthy food.
sive odor. We’ve never had a complaint from the neighbors.” Their humanure toilet system is also illustrated and posted on the internet, where a brief description sums it up: “This simple composting toilet system is inexpensive both in construction and to operate and, when properly maintained, aesthetic and hygienic. It is a perfect complement to organic gardening. In many ways, it out-performs complicated systems costing hundreds of times as much.” Often, knowledge derived from real-life experiences can be diametrically opposed to the speculations of “experts.” Humanure toilet users find, through experience, that such a simple system can work remarkably well.

What about “health agents”? Health authorities can be misled by misinformation, such as that stated in the preceding accounts. Health authorities, according to my experience, generally know very little, if anything, about thermophilic composting. Many have never even heard of it. The health authorities who have contacted me are very interested in getting more information, and seem very open to the idea of a natural, low-cost, effective, humanure recycling system. They know that human sewage is a dangerous pollutant and a serious environmental problem, and they seem to be surprised and impressed to find out that such sewage can be avoided altogether. Most intelligent people are willing and able to expand their awareness and change their attitudes based upon new information. Therefore, if you are using a humanure toilet and are having a problem with any authority, please give the authority a copy of this book. I have a standing offer to donate, free of charge, a copy of *The Humanure Handbook* to any permitting agent or health authority, no questions asked, upon anyone’s request — just send a name and address to the publisher at the front of this book.

Well-informed health professionals and environmental authorities are aware that “human waste” presents an environmental dilemma that is not going away. The problem, on the contrary, is getting worse. Too much water is being polluted by sewage and septic discharges, and there has to be a constructive alternative. Perhaps that is why, when health authorities learn about the thermophilic composting of humanure, they realize that there may very likely be no better solution to the human waste problem. That may also be why I received a letter from the U.S. Department of Health and Human Services praising this book and wanting to know more about humanure composting, or why the U.S. Environmental Protection Agency wrote to me to commend the *Humanure Handbook* and order copies, or why the Pennsylvania Department of Environmental Protection
nominated *Humanure* for an environmental award in 1998. Fecophobes may think composting humanure is dangerous. I will patiently wait until they come up with a better solution to the problem of “human waste,” but I won’t hold my breath waiting.

**LEGALITIES**

This is an interesting topic. The cynic will believe that composting humanure must certainly be illegal. Afterall, humanure is a dangerous pollutant and must immediately be disposed of in a professional and approved manner. Recycling it is foolish and hazardous to your health and to the health of your community and your environment. At least that’s what fecophobes may think. Therefore, recycling humanure cannot be an activity that is within the law, can it? Well, yes actually, the backyard composting of humanure is probably quite within the letter of the laws to which you are subjected.

Waste disposal is regulated, and it should be. Waste disposal is potentially very dangerous to the environment. Sewage disposal and recycling are also regulated, and they should be, too. Sewage includes a host of hazardous substances deposited into a waterborne waste stream. People who compost their humanure are neither disposing of waste, nor producing sewage — they are recycling. Furthermore, regarding the regulating of composting itself, both backyard composting and farm composting are generally exempt from regulations unless the compost is being sold, or unless the farm compost operation is unusually large.

To quote one source, “The U.S. Department of Environmental Protection (DEP) has established detailed regulations for the production and use of compost created from [organic material]. These regulations exclude compost obtained from backyard composting and normal farming operations. Compost from these activities is exempt from regulation only if it is used on the property where it was composted, as part of the farming operation. Any compost which is sold must meet the requirements of the regulations.”

Composting toilets are also regulated in some states. However, composting toilets are typically defined as toilets inside which composting takes place. A humanure toilet, by definition, is not a composting toilet because no composting occurs in the toilet itself. The composting occurs in the “backyard” and therefore is not regulated by composting toilet laws. Portable toilet laws may apply instead, although the backyard compost exemption will probably
allow humanure toilet users to continue their recycling undisturbed.

A review of composting toilet laws is both interesting and disconcerting. For example, in Maine, it is apparently illegal to put kitchen food scraps down the toilet chute in a commercial composting toilet, even though the food scraps and toilet materials must go to the exact same place in the composting chamber. Such a regulation makes no sense whatsoever. In Massachusetts, finished compost from composting toilets must be buried under six inches of soil, or hauled away and disposed of by a septage hauler.

Ideally, laws are made to protect society. Laws requiring septic, waste and sewage disposal systems are supposedly designed to protect the environment, the health of the citizens and the water table. This is all to be commended, and conscientiously carried out by those who produce sewage, a waste material. If you don’t dispose of sewage, you have no need for a sewage disposal system. The number of people who produce backyard compost instead of sewage is so minimal, that few, if any, laws have been enacted to regulate the practice.

If you’re concerned about your local laws, go to the library and see what you can find about regulations concerning backyard compost. Or inquire at your county seat or state agency as statutes, ordinances and regulations vary from locality to locality. If you don’t want to dispose of your manure but want to compost it instead (which will certainly raise a few eyebrows at the local municipal office), you may have to stand up for your rights.

A reader called from a small state in New England to tell me his story. The man had a humanure toilet in his house, but the local municipal authorities decided he could only use an “approved” waterless toilet, meaning, in this case, an incinerating toilet. The man did not want an incinerating toilet because the humanure toilet was working well for him and he liked making and using the compost. So he complained to the authorities, attended township meetings and put up a fuss. To no avail. After months of “fighting city hall,” he gave
up and bought a very expensive and “approved” incinerating toilet. When it was delivered to his house, he had the delivery people set it in a back storage room — and that’s where it remained, still in the packing box, never opened. The man continued to use his humanure toilet for years after that. The authorities knew that he had bought the “approved” toilet, and thereafter left him alone. He never did use it, but the authorities didn’t care. He bought the damn thing and had it in his house, and that’s what they wanted. Those local authorities obviously weren’t rocket scientists.

Another interesting story comes from a fellow in Tennessee. It seems that he bought a house which had a rather crude sewage system — the toilet flushed directly into a creek behind the house. The fellow was smart enough to know this was not good, so he installed a humanure toilet. However, an unfriendly neighbor assumed he was still using the direct waste dump system, and the neighbor reported him to the authorities. But let him tell it in his own words:

Our primitive outhouse employs a rotating 5-gallon receptacle sawdust shitter that sits inside a ‘throne.’ Our system is simple & based largely on your book. We transport the poop to a compost pile where we mix the mess with straw & other organic materials. The resident in our cabin before we bought the farm used a flush toilet that sent all sewage directly to a creekbed. An uninformed neighbor complained to the state, assuming that we used the same system. The state people have visited us several times. We were forced to file a $100 application for a septic system but the experts agree that our hilly, rocky house site is not suitable for a traditional septic system even if we wanted one. They were concerned about our grey water as well as our composting outhouse. My rudimentary understanding of the law is that the state approves several alternative systems that are very complicated and at least as expensive as a traditional septic. The simple humanure toilet is not included & the state does not seem to want any civilian to actually transport his own shit from the elimination site to a different decomposition site. The bureaucrats tentatively approved an experimental system where our sewage could feed a person-made aquatic wetlands type thingie & they agreed to help us design & implement that system. Currently, we cannot afford to do that on our own & continue to use our humanure latrine. The officials seem to want to leave us alone as long as our neighbors don’t complain anymore. So, that’s a summary of our situation here in Tennessee. I’ve read most of the state laws on the topic; like most legal texts, they are virtually unreadable. As far as I can tell, our system is not explicitly banned but it is not included in the list of “approved” alternative systems that run the gamut from high-tech, low volume, factory-produced composting gizmos to the old fashioned pit latrine. For a while now, I’ve wanted to write an article on our experience and your book. Unfortunately, grad school in English has seriously slowed down my freelance writing.”
In Pennsylvania, the state legislature has enacted legislation “encouraging the development of resources recovery as a means of managing solid waste, conserving resources, and supplying energy.” Under such legislation the term “disposal” is defined as “the incineration, dumping, spilling, leaking, or placing of solid waste into or on the land or water in a manner that the solid waste or a constituent of the solid waste enters the environment, is emitted into the air or is discharged to the waters of the Commonwealth.” Further legislation has been enacted in Pennsylvania stating that “waste reduction and recycling are preferable to the processing or disposal of municipal waste,” and further stating “pollution is the contamination of any air, water, land or other natural resources of this Commonwealth that will create or is likely to create a public nuisance or to render the air, water, land, or other natural resources harmful, detrimental or injurious to public health, safety or welfare.”

In view of the fact that the thermophilic composting of humanure involves recovering a resource, requires no disposal of waste, and creates no obvious environmental pollution, it is unlikely that someone who conscientiously engages in such an activity would be unduly bothered by anyone. Don’t be surprised if most people find such an activity commendable, because, in fact, it is.

If there aren’t any regulations concerning backyard composting in your area, then be sure that when you’re making your compost, you’re doing a good job of it. It’s not hard to do it right. The most likely problem you could have is an odor problem, and that would simply be due to not keeping your deposits adequately covered with clean, not-too-airy, organic “biofilter” material. If you keep it covered, it does not give off offensive odors. It’s that simple. Perhaps shit stinks so people will be naturally compelled to cover it with something. That makes sense when you think that thermophilic bacteria are already in the feces waiting for the manure to be layered into a compost pile so they can get to work. Sometimes the simple ways of nature are truly profound.

What about flies — could they create a public nuisance or health hazard? I have never had problems with flies on my compost. Of course, a clean cover material is kept over the compost pile at all times.

Concerning flies, F. H. King, who traveled through China, Korea and Japan in the early 1900s when organic material, especially humanure, was the only source of soil fertilizer, stated, “One fact which we do not fully understand is that, wherever we went, house flies were very few. We never spent a summer with so little annoyance from them...”
as this one in China, Korea and Japan. If the scrupulous husbanding of [organic] refuse so universally practiced in these countries reduces the fly nuisance and this menace to health to the extent which our experience suggests, here is one great gain.” He added, “We have adverted to the very small number of flies observed anywhere in the course of our travel, but its significance we did not realize until near the end of our stay. Indeed, for some reason, flies were more in evidence during the first two days on the steamship out from Yokohama on our return trip to America, than at any time before on our journey.”

If an entire country the size of the United States, but with twice the population at that time, could recycle all of its organic refuse without the benefit of electricity or automobiles and not have a fly problem, surely we in the United States can recycle a greater portion of our own organic refuse with similar success today.

ENVIRONMENTAL POTTY TRAINING 101

Simple, low-tech composting systems not only have a positive impact on the Earth’s ecosystems, but are proven to be sustainable. Westerners may think that any system not requiring technology is too primitive to be worthy of respect. However, when western culture is nothing more than a distant and fading memory in the collective mind of humanity thousands (hundreds?) of years from now, the humans who will have learned how to survive on this planet in the long term will be those who have learned how to live in harmony with it. That will require much more than intelligence or technology — it will require a sensitive understanding of our place as humans in the web of life. That self-realization may be beyond the grasp of our egocentric intellects. Perhaps what is required of us in order to gain such an awareness is a sense of humility, and a renewed respect for that which is simple.

Some would argue that a simple system of humanure composting can also be the most advanced system known to humanity. It may be considered the most advanced because it works well while consuming little, if any, non-renewable resources, producing no pollution and actually creating a resource vital to life.

Others may argue that in order for a system to be considered “advanced,” it must display all the gadgets, doodads and technology normally associated with advancement. The argument is that something is advanced if it’s been created by the scientific community, by humans, not by nature. That’s like saying the most advanced method
of drying one’s hair is using a nuclear reaction in a nuclear power plant to produce heat in order to convert water to steam. The steam is then used to turn an electric generator in order to produce electricity. The electricity is used to power a plastic hair-drying gun to blow hot air on one’s head. That's technological advancement. It reflects humanity’s intellectual progress . . . (which is debatable).

True advancement, others would argue, instead requires the balanced development of humanity's intellect with physical and spiritual development. We must link what we know intellectually with the physical effects of our resultant behavior, and with the understanding of ourselves as small, interdependent, interrelated life forms relative to a greater sphere of existence. Otherwise, we create technology that excessively consumes non-renewable resources and creates toxic waste and pollution in order to do a simple task such as hair drying, which is easily done by hand with a towel. If that’s advancement, we’re in trouble.

Perhaps we’re really advancing ourselves when we can function healthfully, peacefully and sustainably without squandering resources and without creating pollution. That’s not a matter of mastering the intellect or of mastering the environment with technology, it’s a matter of mastering one’s self, a much more difficult undertaking, but certainly a worthy goal.

Finally, I don’t understand humans. We line up and make a lot of noise about big environmental problems like incinerators, waste dumps, acid rain, global warming and pollution. But we don’t understand that when we add up all the tiny environmental problems each of us creates, we end up with those big environmental dilemmas. Humans are content to blame someone else, like government or corporations, for the messes we create, and yet we each continue doing the same things, day in and day out, that have created the problems. Sure, corporations create pollution. If they do, don’t buy their products. If you have to buy their products (gasoline for example), keep it to a minimum. Sure, municipal waste incinerators pollute the air. Stop throwing trash away. Minimize your production of waste. Recycle. Buy food in bulk and avoid packaging waste. Simplify. Turn off your TV. Grow your own food. Make compost. Plant a garden. Be part of the solution, not part of the problem. If you don’t, who will?