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Fecal Matters

Prolegomenon to a History of Shit in Japan

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Poop is yucky. As a rule, yuckiness is socially constructed, but poop is different. Our dislike of the stuff is hardwired into us. Neuroscientists confirmed this in an experiment designed to locate regions of the brain involved in "the response to disgusting stimuli presented in the olfactory modality."[1] Poop's yuckiness is an insistent plea for us to stay away; it protects us from the critters that live in it and could cause illness or even death if ingested. Yuckiness is good, at least with regard to poop. At the same time, poop is more than just yucky; it's necessary, too, and not just in the usual sense of giving form to food the body cannot or will not digest. Babies are born with sterile guts. They must acquire intestinal microflora for their immune systems to develop properly. They pick up these vital bacteria from Mommy's feces on the journey through the birth canal or, barring that, from unwittingly helpful caregivers and well-wishers in the maternity ward.[2]

Poop's yuckiness presents a challenge to the aspiring historian of shit. In Tokugawa and Meiji Japan, people readily acknowledged the essential yuckiness of poop, but they also looked beyond it and indeed embraced shit as an object of utility. In the pages that follow, I will discuss a number of possible topics for a comprehensive history of shit in Japan. In every case, my emphasis will be on shit as something useful—a source of benefit for the individual and the nation. I will, moreover, meditate briefly on notions of the nature of excrement—the shittiness of shit—particularly from an agronomic perspective. Yet, at the end of the day, despite the rich variety of angles from which to look at it, it's still shit we're talking about—yucky poop, disgusting as ever in the olfactory modality.

The Shittiness of Shit

In his discussion of night soil (and fertilizer more generally), Miyazaki Yasusada, the author of the agricultural manual *Nōgyō zensho* (The agricultural

compendium), first published in 1697, cites what he calls an old proverb.[3] Looking at the characters alone, the reader will want to read the proverb as "*Jōnōfu wa kuso o oshimu koto, kogane o oshimu ga gotoshi*"—something like, "The superior farmer values shit as he values gold." Actually, however, Yasusada glosses the character 糞—normally read *kuso* or *fun,* "shit"—as *koe,* "fertilizer." He does this, in fact, throughout his entire discussion of fertilizer.[4] Now, the usual character for *koe* is 肥, the *hi* of *hiryō* 肥料, "fertilizer," and *himan* 肥満, "obesity." Yasusada uses this character as well, but he uses it to describe the beneficial results of the application of fertilizer. This suggests a slippage in meaning—"shit" 糞 is not waste but rather anything that nourishes and enriches the land and makes it literally "fat," *koechi* 肥地, be it excrement, compost, green fertilizer, or the mud of streambeds.[5]

Yasusada divides fertilizers into various categories depending on their source and use, but he eventually settles on a broad differentiation between "miscellaneous shit" (*zōgoe* 雑糞) and "superior shit" (*jōgoe* 上糞); in both cases, I'm using "shit" in his capacious sense. Night soil is "superior shit," along with things such as oil cake (the dregs of cottonseed and sesame seed that have been pressed for oil), dried sardines, and the remains of whale meat and bones boiled and pressed.[6] He makes no mention of night soil per se as a commodity, though the other items in the "superior shit" category were commercial fertilizers. In any case, he is certainly cognizant of agriculture as a commercial enterprise. He cautions against using "superior shit" on crops that won't return a high price or in fields without the labor to make the most of its potent power. Don't invest more in fertilizer, in other words, than the crop is worth.[7]

I should like to stress that even useful shit is still yucky; but its utility trumps its yuckiness. Hiraga Gennai made this point in his 1776 treatise, "On Farting" ("Hōhiron"). Here I quote William Sibley's elegant translation:

> All things that lie between heaven and earth array themselves naturally into categories of high and low, lofty and base. Among them, surely the lowest of the low, the basest of the base, are urine and excrement. In China they have various pejorative figures of speech in which things are compared to "ordure," "coprolith," etc., while in Japan we simply say of things we don't care for that they're "like shit." Yet this loathsome filth, we should not forget, is turned into fertilizer and thereby nourishes the millions.[8]

Gennai's essay on farting was intended to amuse his readers. Conversely, a lecturer named Furuichi Matsuo, speaking in 1915, was not joking when he said, "As you all know, excrement is bad smelling, foul looking, dirty stuff. Yet, for we farmers, it's deeply important—treasure, really." In fact, Furuichi continued, it's not proper to think of excrement as dirty, for shit is nothing less than rice transmuted:

"If rice is important, so too is shit (*kuso*)." Unfortunately, some people just don't get it—especially folks in Tokyo, who call farmers "poop handlers" (*kuso nigiri*) and "turd tinkers" (*kuso ijiri*). He concluded ominously that such people might change their tune and stop looking down on farmers if they stopped collecting their night soil—in ten days Tokyo would be inundated in a sea of shit and piss.[9]

Without being quite so angry or aggressive, other writers made the same association between rice and shit as Furuichi did. The author of a short essay entitled "Which Is More Precious, Shit or Rice?" reads much into the characters used to write "shit," 糞 and 屎 (either can be read *kuso*).[10] The first combines the characters for "rice" 米 and "different" 異, the second "rice" and "corpse" 尸. In either case, he argues—invoking an appealing but incorrect folk etymology—that the characters demonstrate that shit is the transmutation of rice.[11] Hence, "rice and shit are of the same essence but manifest themselves in somewhat different forms. Man depends on rice to live; shit depends on man to be formed; and rice depends on shit to grow. Rice becomes shit and shit becomes rice in an endless cycle of birth and rebirth." Indeed, it's only because rice goes in the mouth and shit comes out the anus that we think of the one as pure and the other as filthy. After all, when we eat rice, it's like we are indirectly eating shit. We're getting into pretty disgusting territory here, and by the point the author declares, "In this world, nothing is as important as shit," one senses that he is not being entirely serious. Nevertheless, the basic circle-of-life storyline is one repeated frequently in Japanese discourses on shit.

Shit as a Natural Resource

Another late seventeenth-century farm manual, *Hyakushō denki* (The farmer's memoir), devotes one of the work's fifteen fascicles to a discourse on *fujō*, "the unclean."[12] Although the anonymous author explicitly defines *fujō* as "excrement and urine" (*daishōben*), much of the fascicle is given over to a general discussion of fertilizer in its myriad forms, including varieties of green fertilizer from land and sea and animal products ranging from horse manure, bird droppings, and dried sardines to dried turtle meat, bivalves, and gastropods. Whatever the source—animal, vegetable, or human—because fertilizer requires careful curing and preparation before use, the author devotes much of his account to detailed instructions on the alchemy required to transform raw shit into useful fertilizer. For night soil, the basic task of curing meant leaving excrement in a closed container for about a year to kill harmful bacteria and parasites; only then could yucky poop realize its destiny as an object of utility.

Despite the author's ecumenical view of shit, he lavishes the most detail on human excrement and urine, with detailed tips on best practices for their

collection and use. "Waste not a single drop of shit," he exhorts the reader, for "shit nourishes the land" and ensures the cultivator his livelihood and prosperity. In elite households, he tells us, *setchin* is the word for a toilet in the northern part of the house. If it's in the western section it is a *saijō*, and in the east, it is a *tōen*. But surely the most elegant place to do one's business is in the southern part of the house, in the "fragrant-fragrant" *kōkō*.[13] Ordinary folk without the wherewithal to indulge in fancy toilet construction should place their privies where the excreta will be protected from rain, which disrupts the curing process. Chamber pots should be placed discreetly around the dwelling for the convenience of women and children who, out of incontinence or fear of the dark, may not be able to make it to the toilet; besides, it's inconvenient and a waste of time to go all the way to the toilet to fulfill one's needs. Indeed, "waste not, want not" is the author's constant theme—don't waste time, don't waste shit, don't even waste dishwater, for it too is a useful form of "shit."

Not all shit is created equal. For one thing, different crops require different types of fertilizer. For example, seaweed harvested in the sixth and seventh months is excellent for barley and potatoes, provided the earth is not inordinately wet. The meat of fish, turtles, and shellfish can be extremely efficacious in fertilizing rice paddies, but they must be prepared and used with great care, for they are so potent that rice plants will easily overdose. Indeed, when using any type of oily fertilizer on rice, it's best to inquire of experienced local farmers what works best.[14] Even as a by-product of human digestion, not all shit is created equal. "The shit of people whose diets are rich in flavorful foods, with lots of fish, is particularly potent, while that of those who eat simply does not nourish crops well. Therefore, villages that gather shit from prosperous areas (*hanjō no chi:* i.e., urban areas) and use it to fertilize their paddies and fields enjoy bountiful harvests of grain and vegetables."[15]

The idea that some people's feces are particularly potent was widely accepted in Japan. Night soil collectors in Edo routinely paid a premium to empty the privies of the well-born and well-fed residents of daimyo mansions and high-end Yoshiwara brothels. In modern times, night soil from military barracks was considered to be the best because soldiers ate a lot of meat. Excreta from the pleasure quarters was generally highly regarded as well, though connoisseurs engaged in contentious debates over questions like the relative quality of different red-light districts and whether cheap brothels, with their legions of young customers, might not be better sources of robust poop than fancy joints.[16] Farmers in the eastern outskirts of modern Tokyo claimed to be able to discern a household's economic status with a glance at its shit: the poop of the rich was greasy and plump, whereas the turds of the poor simply bobbed forlornly in the slurry.[17]

Quality in, quality out: the logic is unimpeachable, and poop scientists in the early twentieth century endorsed this commonsensical view with studies that

demonstrated that diets rich in protein rendered poop high in nitrogen.[18] Still, surely the tea farmers of Uji in the 1830s needn't have insisted on using night soil from only two streets in the tony Kamigyō district of Kyoto to fertilize their oldest and best tea plants.[19]

The noted agronomist Satō Nobuhiro lists thirty-six different types fertilizer—animal, vegetable, and mineral—in his comprehensive treatise on crop fertilization, *Baiyō hiroku* (Secrets of fertility), but reserves pride of place for human excrement. Its oiliness warms and nourishes, and its volatility ensures that essential salts are quickly infused into the plant; crops treated with night soil grow strong and true.[20] In another work, *Jūjigō funbairei* (Annotated guide to manuring), Nobuhiro presents a series of sometimes rather elaborate fertilizer recipes, cooked up to suit diverse crops, climates, and soil conditions; despite the variety, the great majority feature night soil as a principal ingredient.[21]

Nobuhiro's contemporary, Ōkura Nagatsune, the "technologist" celebrated by Thomas C. Smith, starts his discussion of night soil with the comment that excrement is so well known among farmers as an efficacious fertilizer that there is no need for a detailed discussion. True to his word, he does little more than caution his readers against applying insufficiently cured, lumpy night soil to plant roots for fear of causing the plant and its neighbors to die of a nutrient overdose.[22]

Rather than preach to the choir on the virtues of shit, Nagatsune dwells on urine, which is much appreciated as a fertilizer in the Kansai region but disdained by peasants in the environs of Edo, who think it poorly suited to the local soil. Nagatsune concedes that raw urine can kill plants but insists that, with proper curing, it works extremely quickly and effectively, particularly on stems and leaves, making it ideal for leafy vegetables, eggplant, green onion, and watermelon (just the sort of crops, in fact, that truck gardeners in the outskirts of Edo produced). The urine of people who engage in hard physical labor is concentrated and particularly potent, so—in contrast to excrement—the poor are a better source of pee than the rich.[23]

If Tokugawa agronomists were connoisseurs, ever ready to debate the goût de terroir of regional shits, their counterparts writing during the golden age of stercorary science in Japan—roughly the 1890s through the 1910s—were simple utilitarians who pooh-poohed the notion that differences in fecal quality were significant enough for the average farmer to worry about.[24] Their concern instead was that farmers were not sufficiently aware of the value of night soil or that even if they were, their methods of processing the stuff did not maximize the potential return on Japan's GNP—Gross National Poop—a figure estimated in 1914 to be something like 106 million *koku,* or a bit more than 5 billion gallons of raw shit, assuming an average annual output of about 2 *koku* (95 gallons) for each of Japan's 53 million men, women, and children.[25]

Koshikawa Zenshichi, writing in 1901, runs his readers through a series of quick calculations of the value of their own output of poop. A rural household of five produces about 10 *koku* of excrement per year, to which is added 3 *koku* of water to make 13 *koku* (618 gallons) of fertilizer base. This is equivalent to 43.3 loads (*ni*) of night soil, worth 3.90 yen at 0.09 yen per load retail. In addition, let us assume that each household member produces around 1 *shō* 1 *gō* (just over half a gallon) of urine each day, or about 4 *koku* per year. The 20 *koku* (950 gallons) of urine produced by the entire household is worth 3.333 yen, assuming a retail price of 0.05 yen per load. Hence, one household produces about 7.233 yen worth of excrement and urine per annum. Since it would cost 25.037 yen to buy the chemical nutrients found in the family excreta, the household actually saves 17.844 yen per year—a significant sum in 1901—by using its own night soil. But wait, there's more! If that same family employed Koshikawa's new and improved system for curing night soil, they could extract even greater value—33.097 yen worth of nutrients—from their 7.233 yen of poop. That's an annual savings of 25.864 yen![26] And, of course, the more you poop, the more you save.

If Koshikawa had been writing during the Tokugawa period, he might have been satisfied to begin and end his sales pitch with an appeal to the individual profit-maximizing instincts of Japan's many rational peasants. But since he was writing in the Meiji era, it figures that his story is ultimately a national one: the nation as a whole actually produces enough shit to nourish its agricultural lands, but waste and inefficiency lead to the loss of two-thirds of the nitrogen and other nutrients housed in that shit. Instead of self-sufficiency, the nation has to expend valuable resources on chemical and other commercial fertilizers. Other writers confirmed Koshikawa's basic point: in 1913, night soil accounted for only 22 percent of the fertilizer market by value, but the figure is low only because night soil was so cheap. Replacing the nutrients with other sources would cost the nation dearly.[27]

Koshikawa wasn't the only one thinking about the possibilities of shit. "The progress of culture [is] a question of sewage," wrote the German chemist Justus von Liebig in the mid-nineteenth century, expressing a sentiment that his colleagues in Meiji Japan would have found eminently sensible. Liebig was concerned that the land would be irredeemably depleted unless nutrients were returned to it in the form of human and animal excreta. Indeed, he attributed "the singular continuity of Chinese culture across millennia" to the "exemplary perfection" of the Chinese in recycling their excreta.[28] Other Western observers, including James Madison, concurred.[29] By the end of the century, Liebig's ideas had inspired others to extol the fertilizing properties of poop. In 1896, a group of German technocrats published a massive study titled "The Use of Urban Waste Material," and planners in Berlin and a number of cities in the western United States implemented ambitious

if ultimately short-lived schemes to commodify shit, projects that foundered once flush toilets and chemical fertilizers became widely available.[30]

Shit as a Commodity

By the latter part of the Tokugawa period, urban centers such as Edo and Osaka were major sources of night soil for peasants in the surrounding countryside. The night soil trade is the one aspect of the history of shit in early modern Japan that has been covered reasonably extensively. Scholars have focused particularly on the implications of night soil use for urban hygiene and on the complexities of the market for night soil in the countryside. Among those writing in English, Louis Perez examines the night soil trade panoramically, with a focus on the eighteenth century.[31] Susan B. Hanley, who is concerned with the quality of life in early modern Japan, argues that the commodification of shit helped make Edo, Osaka, and other Japanese cities far more sanitary and livable than large urban centers in Western Europe.[32] In the hinterland of Edo, the development of the agricultural economy in the eighteenth century fostered the development of a lively market for night soil and with it the emergence of a complex array of overlapping and sometimes conflicting rights. Anne Walthall, looking at the poop wars from the countryside, has examined the strains on regional solidarity among villages.[33]

Aratake Ken'ichirō describes how the night soil trade worked in one village near Osaka around the beginning of the nineteenth century. Well-to-do residents of Hashiramoto, a community on the western bank of the Yodo River, contracted with forty-five landlords in three urban wards to pay 25 *monme* in silver annually for rights to the contents of the landlords' latrines. Twice a month, three groups of four villagers each went into the city the collect the merchandise. Aratake speculates that rather than do the dirty work themselves, the villagers likely hired proxies from the ranks of their less fortunate neighbors. In any case, the work was so onerous that the teams invariably spent at least one night—and sometimes as many as three—in Osaka each time they went on their poop-scooping rounds. After the raw night soil was delivered to the village by boat, the contracting villagers took what they needed themselves and sold the leftovers to their neighbors.[34] Iwabuchi Reiji describes a similar arrangement in Edo on the eve of the Restoration. About half the residents of Tokumaru village participated in a night soil syndicate, in which they exchanged cash, eggplants, fresh and dried daikon radishes, and pickles for the excrement of 146 households in three Edo neighborhoods.[35]

Tokumaru was in the western suburbs of Edo, where the lack of convenient water transportation routes retarded the development of a large-scale retail market for poop. East of Edo, however, night soil was a big business, and it remained so until the early decades of the twentieth century. The ready availability of night soil

for fertilizer encouraged the development of truck gardening, with the result that the eastern suburbs supplied most of the city's fresh vegetables, fruit, and flowers until industrialization and urban sprawl swept over the area in the period after World War I.

Although many villages east of Edo contracted directly with urban landlords for the contents of their toilets, a lot of night soil was moved by brokers who hired workers to empty privies and carry the contents to wharves on the rivers in the east of Edo, where it was loaded onto boats and carried upstream as far as forty kilometers from the city. Brokers sometimes owned their own night soil boats, but often they simply hired boats worked by owner-operators who lived aboard their vessels with their families. The night soil boats and their operators were famous for their gaudy appearance and for the pride they took in running boats clean enough to haul vegetables back to the city after they had been emptied of their yucky cargoes upstream. They were also occasionally accused of dirty tricks like adding river water—and toilet paper—to the night-soil buckets as they went upstream, proffering increasingly watery shit to beleaguered farmers in the capital's exurbs. Although all sorts of cargo moved in and out of Edo/Tokyo on the intricate network of rivers and canals that once characterized the city, night soil was surely the most voluminous of all: according to figures compiled by the government of Tokyo in 1872, almost a quarter (1,564 of 6,545) of the vessels in the prefecture were night soil boats.[36]

Competition for night soil led to all sorts of conflict. Landlords might sell their tenants' shit to individual peasants, villages, or night soil brokers; in some cases, the income from the toilets might exceed the rent collected on a tenement's apartments. As demand for night soil grew in the late eighteenth century, consumers eager to get their hands on raw shit participated in bidding wars that drove up the price of night soil significantly. Peasants priced out of the poop market occasionally banded together in an effort to persuade the shogunal authorities to intervene and either force down the price of night soil by fiat or drive brokers—whom peasants blamed for ratcheting up prices—out of the market altogether. Major conflicts occurred at least four times between 1789 and 1867; the first instance embroiled more than a thousand villages in Musashi and Shimōsa provinces.[37]

Urine was another matter altogether. Farmers in the hinterland of Edo had little interest in using urine as a fertilizer, notwithstanding the efforts of Ōkura Nagatsune and other boosters to persuade them otherwise. A few enterprising entrepreneurs did set out urinals in the city, but almost all of early modern Edo's pee ended up at the site of relief, be it the side of the road or the side of a building. In western Japan, however, urine was highly valued as a fertilizer. In urban tenements, residents ceded rights to their feces to the landlord or building manager, but their urine was theirs to sell to the highest bidder. In Osaka that was likely

to be a urine jobber (*shōben nakagainin*) or a member of the urine guild (*shōben nakama*), a group that claimed members in around four hundred villages by the time of the Meiji Restoration. (Incidentally, some villages in the hinterland of Osaka bought night soil but not urine, others urine but not night soil, and still others bought excreta of all sorts.)[38]

Passersby in Osaka could empty their bladders at one of the many public urinals (*tago*) placed around the city. The men and women who found relief there (women stood to pee everywhere except in polite Edo society, we're told) probably did so without much regard for the conflicts over rights to the contents of public urinals that raged almost incessantly in the city from the early eighteenth century until shortly after the Meiji Restoration.[39]

The problems started in 1740, when the city authorities gave the elders of Watanabe village, the most important outcaste community in western Japan, the right to set out public urinals. The gesture was a mark of gratitude to the outcastes for their efforts in fighting a major fire; moreover, the income stream from the urinals would help compensate the Watanabe village elders for ensuring that their community fulfilled its particular feudal duties. Unfortunately, in the zero-sum world of Osaka urine, the granting of rights to the outcastes meant that townsmen who had apparently previously enjoyed rights to manage public urinals were hurt. The aggrieved commoners tried everything to break the outcastes' monopoly: they put out their own illegal urinals; they damaged and destroyed the outcastes' pissoirs; they even sabotaged the basins' precious cargo by pouring sand into the containers. If such problems were not enough, the outcaste urinal managers had to deal with incidents like the case of Chūbei, a peasant caught pilfering pee from an outcaste-owned urinal in 1743. The authorities invariably supported the outcastes when disputes came to court, yet they seemed unable to put a decisive end to the conflict.[40]

As Kobayashi Shigeru argues, it was only because urine was such a valuable commodity that people cared enough to sabotage urinals or steal pee outright. And indeed it was valuable: as early as 1776, the outcastes estimated their urinal income to be enough to buy three hundred *koku* of rice—roughly enough to feed three hundred people for a year. In the decades that followed, the demand for urine increased, and so did complaints about unscrupulous dealers who adulterated the urine they sold and householders who turned their noses up at the daikon radishes they had once happily received in exchange for their pee and instead demanded cotton yarn, high-grade rice, and other luxuries.[41]

In all the tussles over night soil and urine, the winner was the guy who got his hands on the excreta. Although "purity" and "pollution" are key words in discussions of traditional Japanese culture, they don't come up in the writings of those who pondered poop as a resource or commodity. Sure, people saw excrement as

yucky and disgusting, but collecting, transporting, and handling the stuff was not defiling. Nor did working in the poop industry jeopardize one's standing as a commoner. Unlike the carcasses of livestock—whose handlers were inevitably marked as outcastes—night soil was dirty but not polluting. Shit isn't blood.

The institutions governing urban shit began slowly to change after the Meiji Restoration of 1868. In 1874, the Osaka prefectural government disbanded the night soil league (*shimogoe kumiai*) that had represented 309 local villages and regulated the collection of night soil directly, instituting a series of anal rules concerning the storage and transport of raw shit: keep it covered, don't leave it out on the streets when collecting, move it only at night, don't move it at all when there's a lot of traffic on the roads and rivers, and so on.[42]

Aratake notes that throughout the regulations, there is a consistent and wholly novel concern with smell: poop has always been stinky, but its stinkiness was the object of official concern only in the 1870s. He argues that this was probably due to the fear of cholera, which reached Japan in 1858 and whose spread was linked by officials and the public to malodorous smells. A major cholera epidemic in 1877 upset the balance between the production of night soil in the city and its consumption in the countryside. During times of anxiety about cholera, peasants refused to come into the city to empty privies.[43]

The real turning point in the history of shit came after World War I. As Tokyo grew and its populace simply produced far more shit than the local agricultural economy could absorb, a teeming latrine became a liability, and urbanites were forced to pay others to relieve them of their shit. In Hongō ward in the eastern section of Tokyo, the tipping point came in 1918, when in response to residents' complaints of a "deluge of excrement," the authorities were finally forced to hire night soil men to haul away excess shit in some neighborhoods; emboldened carriers reneged on their contracts and refused to empty toilets until they received a fee. The toilets emptied for a fee still provided night soil to local farmers: in 1935, the ward supplied over 61,000 loads of night soil to agricultural associations in Chiba, Saitama, and Tokyo prefectures.[44] In Yokohama the crisis occurred a bit later, in 1921, but the storyline is very similar: peasants, realizing that the supply of shit in the booming metropolis far outpaced demand, abruptly stopped paying for night soil and demanded a fee instead. The city, faced with the problem of disposing of 5,150 loads of night soil every day, had no choice but to capitulate to the farmers' demands.[45]

Shinoda Kōzō, in his nostalgic look back at Meiji Tokyo, contrasts his childhood memories of the family poop man, an uncultured but kind-hearted rustic from a village near the Tama River, with the privy cleaners of the present day—that is, the early 1930s—men who just don't give a shit: it's all waste to them, so they're surly, they don't mind spilling, and if anyone complains they'll carry the grudge

(with stinky consequences, no doubt). Back in the day, when a farmer would come with his oxcart to receive oh so gratefully the precious contents of the loo, you could "shit to your heart's content (*kuso shihōdai*)," but now. . . .[46]

Coda: Who Gives a Crap about the Environment?

Poop is yucky, especially when it's underfoot or in the water supply. Yuckiness abounded in the cities of early modern Europe; in Japanese cities, not so much. Much credit goes to the night soil man for making a city like Edo a relatively healthful place to live, but as Susan Hanley notes, good water helped as well. Abundant rain and freshets of melted mountain snow flushed pollutants from the rivers that supplied the city with its water; cleverly designed aqueducts helped keep the clean river water clean for many of the city's residents.[47]

Edo was a green city; London was brown. Wonderful—but were the city fathers thinking green when they laid out Edo's infrastructure? Reading Ishikawa Eisuke's bizarrely chauvinistic celebrations of premodern Japan, one would think so: indeed, in his presentation, the French might have avoided the Black Death and their revolution had they only thought to value shit as the Japanese did.[48] Less ostentatiously celebratory is Itō Yoshiichi, who has detailed Edo's surprisingly sophisticated system for disposing of the garbage produced by prosperous commoners: contractors hauled it away for use in landfill or occasionally to sell to rural farmers for use as yet another form of organic fertilizer. (Commoners in poor neighborhoods and samurai in general had to deal with their own garbage, which they did, often in unsanitary ways.)[49]

Iwabuchi Reiji sounds a note of caution.[50] Cities like Edo may have been relatively sanitary, but one shouldn't equate green results with green intentions. And in any case, clean compared to eighteenth-century London isn't necessarily very clean at all. The Japanese recycled garbage and marketed shit not because they wanted to preserve the environment per se, but because it made practical sense to do so. When given the opportunity to be bad custodians of their surroundings, they often took it.[51]

An incident from 1784 illustrates this point. Villagers from the hinterland of Edo, apparently heeding Ōkura Nagatsune's advice to embrace the fertilizing powers of urine, petitioned to place urinals in the streets of Edo. Commoner officials, pondering the question at the behest of the city magistrates, opposed the scheme. They complained that urine buckets in narrow city streets would hinder commerce and obstruct traffic during the day and pose the risk of injury to passersby stumbling across them at night. They fretted over the possibility of insulting the sensibilities of the city's most exalted residents—it would hardly to do for the shogun to glimpse a pissoir while passing through the commoner wards on

procession (*onari*), and since many shops in the city were official provisioners to daimyo mansions, stinky pee smells mustn't mar their wares. Hiding urinals in back alleys was hardly better: alleys were even narrower than main streets, and the people back there already had toilets in their tenements. And in any case, what's the big deal about peeing into drainage ditches or directly onto the ground?

In a conciliatory gesture, however, the officials said that they wouldn't mind if the urinals were set out in poorer neighborhoods—Fukagawa and Honjo might be good choices—so long as the petitioners avoided areas where there already were more than 160 public urinals put out by enterprising night soil men. Incidentally, 160 public urinals may sound like a lot—or not: Edo had more than a million people, after all—but even with all those urinals around, more than half of Edo's urban wards (*chō*) remained without public facilities until the end of the Tokugawa period, despite a series of petitions similar to the one in 1784.[52]

As Nesaki Mitsuo argues, the episode strikes the modern reader as odd. Potties are a convenience, yet the officials seem to have considered them a nuisance best relegated to marginal districts: Edoites could drain their bladders at home, use an acquaintance's facilities, or take a leak into a ditch in an emergency. To be sure, they had some sense that urine would make good fertilizer, but it does not seem to have occurred to them that the urinals would contribute to making Edo a cleaner, more livable city—notwithstanding that all parties openly acknowledged the foul smell of urine and all excreta.[53]

All this talk about the environmental consequences of people's toilet habits would surely have mystified people in early modern Japan. They didn't share our concept of or concern with the environment, so it figures that they didn't care whether their shit was green or brown so long as it remained an object of utility: stinky and yucky but useful all the same. That, much more than conservation or sanitation, is the story of shit in Japan.

Notes

1. Maike Heining, Andrew W. Young, Glavkos Ioannou, Chris M. Andrew, Michael J. Brammer, Jeffrey A. Gray, and Mary L. Phillips, "Disgusting Smells Activate Human Anterior Insula and Ventral Striatum," *Annals of the New York Academy of Sciences* 1000 (2003): 380–384.

2. Lars Å. Hanson, Marina Korotkova, Samuel Lundin, Liljana Håversen, Sven-Arne Silfverdal, Inger Mattsby-Baltzer, Birgitta Strandvik, Esbjörn Telemo, "The Transfer of Immunity from Mother to Child," *Annals of the New York Academy of Sciences* 987 (2003): 199–206.

3. Miyazaki Yasusada, *Nōgyō zensho* (1697) (*Nihon nōsho zenshū,* vols. 12–13), ed. and annot. Yamada Tatsuo et al. (Tokyo: Nōsangyoson Bunka Kyōkai, 1978), vol. 12, 101.

4. Ibid., 91–105; the section on fertilizer is simply entitled "*Koe*."

5. Ibid., 93.

6. Ibid., 98.

7. Ibid., 101–102.

8. Fūrai Sanjin [Hiraga Gennai], "Hōhiron" (On farting), trans. William Sibley, in *Readings in Tokugawa Thought* (Chicago: University of Chicago Center for East Asian Studies, 1993), 149–156.

9. Furuichi Matsuo, "Jinpunnyō no hanashi," in *Guntai nōji kōenshū*, 2 vols. (Tokyo: DaiNihon Nōkai, 1915), vol. 2, 244, 245, 246.

10. "Kuso to kome to wa izure ga tōtoki ka," *Nihon nōgyō zasshi* (1909), reprinted in Tsubame Sakuta, *Shimogoe* (Tokyo: Yūrindō, 1914), 191–199.

11. See the etymological discussion in Morohashi Tetsuji, ed., *Dai Kan-Wa jiten,* 13 vols. (Tokyo: Taishūkan Shoten, 1955–1960), s.v. 糞,屎.

12. Anon., *Hyakushō denki*, 2 vols., ed. and annot. Furushima Toshio (Tokyo: Iwanami Shoten, 1977), vol. 1, 156–185. The text was produced in Tōtomi or Mikawa (modern-day Aichi Prefecture), most likely around 1681 to 1683. See Fukaya Katsumi, "Kinseiteki hyakushō jinkaku: *Hyakushō denki* ni arawareta," *Waseda daigaku daigakuin bungaku kenkyūka kiyō* 26 (1980): 157–166.

13. *Hyakushō denki,* vol. 1. 157–158.

14. Ibid., 170–171.

15. Ibid., 168.

16. Anne Walthall, "Village Networks: *Sōdai* and the Sale of Edo Nightsoil," *Monumenta Nipponica* 43:3 (autumn: 1988): 295; Hori Mitsuhiro, "Tōkyō kinkō nōson ni okeru shimogoe riyō no shosō," in *Nihon minzoku fiirudo kara no shōsha,* ed. Inokuchi Shōji (Tokyo: Yūzankaku, 1993), 120.

17. Hori, "Tōkyō kinkō nōson," 119.

18. Koshikawa Zenshichi, *Shinshiki jinpunnyō toriatsukai benpō: Ichimei nōji kairyō daigen* (Tokyo: Yūrindō, 1901), 50–55. Koshikawa cautions, however, that in addition to diet, many other factors affect the quality of a person's excrement, particularly age and general health. Tsubame, *Shimogoe,* 25, notes that although the feces of people with high-protein diets is indeed rich in nitrogen, people with low-protein diets produce feces with other types of nutrients.

19. Ōkura Nagatsune, *Nōka hibairon* (1830s), 25–137 in *Nihon nōsho zenshū,* vol. 69, *Gakusha no nōsho 1,* ed. Tokunaga Mitsutoshi (Tokyo: Nōsangyoson Bunka Kyōkai, 1996), 50–51.

20. Satō Nobuhiro, *Baiyō hiroku* (1840), 153–391 in Tokunaga, *Nihon nōsho zenshū,* vol. 69, 241–242.

21. Satō Gen'an and Satō Nobuhiro, *Jūjigō funbairei*, ed. Oda Kanshi (n.p.: Oda Kanshi, 1872). Gen'an was Nobuhiro's great-grandfather. In his agronomic works, Nobuhiro always presented himself as merely passing down the techniques and knowledge of his ancestor. See Morita Hideki, "Edo no shinyō sehi jijō," *Toshi to haikibutsu* 36:2 (2006): 51–54.

22. Ōkura, *Nōka hibairon,* 49–51. See Thomas C. Smith, "Ōkura Nagatsune and the Technologists" (1970), reprinted in Smith's *Native Sources of Japanese Industrialization, 1750–1920* (Berkeley: University of California Press, 1988), 173–198.

23. Ōkura, *Nōka hibairon,* 37–39.

24. Hara Hiroshi, *Hiryōhen* (Tokyo: Hakubunkan, 1892), 71.

25. Tsubame, *Shimogoe,* 24. The population figure excludes Korea.

26. Koshikawa, *Shinshiki jinpunnyō toriatsukai benpō,* 36–39.

27. Ibid., 36–38. See Tsubame, *Shimogoe,* 6, for the value of night soil as a percentage of the entire fertilizer market; Furuichi, "Jinpunnyō no hanashi," 245, for a lamentation of the high cost of replacing night soil's nutrients with chemicals from other sources.

28. Joachim Radkau, *Nature and Power: A Global History of the Environment,* trans. Thomas Dunlap (Washington, DC: German Historical Institute; New York: Cambridge University Press, 2008), 12–13.

29. Steven Stoll, *Larding the Lean Earth* (New York: Hill and Wang, 2002), 39.

30. Radkau, *Nature and Power,* 145, 208.

31. Louis G. Perez, *Daily Life in Early Modern Japan* (Westport, CT: Greenwood Press, 2002), 217–226.

32. Susan B. Hanley, "Urban Sanitation in Preindustrial Japan," *Journal of Interdisciplinary History* 18:1 (summer 1987): 1–26.

33. Walthall, "Village Networks," 293–302.

34. Aratake Ken'ichirō, "Kinsei kōki ni okeru shimogoe no ryūtsū to kakaku keisei," *Ronshū kinsei* 24 (2002): 1–21, especially 3–8.

35. Iwabuchi Reiji, "Kinsei toshi no toire to shinyō mondai no genkai," *Rekishi to chiri* 484 (December 1995): 52–53.

36. Ibid., 53–55. On the night soil boats and their operators' tricks, see Hori, "Tōkyō kinkō nōson," 118, 120. On the night soil wharves in Edo, see Iwabuchi Reiji, "Edo no shimogoe no kashi ni tsuite," *Chihōshi kenkyū* 262 (August 1996): 4–9.

37. Walthall, "Village Networks," discusses the 1789 protest in detail. On conflicts in the nineteenth century, see Kobayashi Shinado, "Kinsei kōki Edo shūhen chiiki ni okeru shimogoe ryūtsū no hen'yō: Tenpō, Kōka-ki no shimosōjidai hikisage negai to gijō o chūshin ni," *Senshū shigaku* 38 (2005): 42–105, and Kobayashi Shinado, "Keiōki no shimogoe nesagerei to shimogoe ryūtsū," *Senshū shigaku* 43 (2007): 125–152.

38. On the distribution of rights to urine, see Iwabuchi, "Kinsei toshi no toire," 50. On the urine guild in Osaka, see Kobayashi Shigeru, *Nihon shinyō mondai genryūkō* (Tokyo: Akashi Shoten, 1988), 68–69.

39. On women routinely standing to urinate, see Iwabuchi, "Kinsei toshi no toire," 50, and "Shōbenkō," *Kokkei shinbun*, no. 159, reprinted in Tsubame, *Shimogoe,* 204–206.

40. Kobayashi, *Nihon shinyō mondai genryūkō,* 70–73. Hanley, "Urban Sanitation in Preindustrial Japan," 10, briefly discusses disputes over Osaka urinals.

41. Kobayashi, *Nihon shinyō mondai genryūkō,* 73–78.

42. Aratake Ken'ichirō, "Meiji zenki Ōsaka ni okeru shinyō mondai," *Ōsaka Shiritsu Kōbunshokan kenkyū kiyō* 15 (2003): 3–19. See also Yoshimura Tomohiro, "Toshi buraku ni okeru shinyō shori mondai no tenkai: Shiiki hennyūki no Ōsaka Minami-ku Nishihamachō no gutaizō," *Sekai jinken mondai* 6 (2001): 157–173. Similar rules were instituted in Tokyo in 1872: Nesaki Mitsuo, "Edo no shimogoe ryūtsū to shinyōkan," *Ningen kankyō ronshū* 9:1 (2008): 19.

43. Aratake, "Meiji zenki Ōsaka."

44. Hongō Kuyakusho, ed., *Hongō ku shi* (Tokyo: Hongō Kuyakusho, 1937), 899–901. Many thanks to Jordan Sand for guiding me to this source.

45. Kira Yoshie, "Shinyō shori o meguru toshi to nōson: 1921-nen no Yokohama shigaichi to kinkō chiiki," in *Yokohama kinkō no kindaishi: Tachibana-gun ni miru toshika, kōgyōka,* ed. Yokohama Kindaishi Kenkyūkai (Yokohama: Yokohama Kaikō Shiryōkan, 2002), 103–132.

46. Shinoda Kōzō, *Meiji hyakuwa,* 2 vols. (Tokyo: Iwanami Shoten, 1996), 163–166.

47. Susan B. Hanley, *Everyday Things in Premodern Japan: The Hidden Legacy of Material Culture* (Berkeley: University of California Press, 1997), 111.

48. Ishikawa Eisuke, *Ōedo risaikuru jijō* (Tokyo: Kōdansha, 1997), 158.

49. Itō Yoshiichi, *Edo no yumenoshima* (Tokyo: Yoshikawa Kōbunkan, 1982).

50. See Iwabuchi Reiji, "Edo no gomi shori saikō: 'Risaikuru toshi,' 'seiketsu toshi' zō o koete," *Kokuritsu Rekishi Minzoku Hakubutsukan kenkyū kiyō* 118 (February 2004): 301–336. Iwabuchi Reiji, "Kinsei no toshi mondai," *Rekishi to chiri* 560 (December 2002): 1–16, deals mostly with garbage disposal in the service of the same argument.

51. With regard to garbage, Japan was not so different from the West in the age before mass production. Susan Strasser, *Waste and Want: A Social History of Trash* (New York: Henry Holt & Co., 2000).

52. Nesaki, "Edo no shimogoe ryūtsū to shinyōkan," 16–19; Iwabuchi, "Kinsei toshi no toire," 50–51.

53. Nesaki, "Edo no shimogoe ryūtsū to shinyōkan," 19.