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**Institute of Current World Affairs**  
The Crane-Rogers Foundation  
Four West Wheelock Street  
Hanover, New Hampshire 03755 U.S.A.

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*James Workman is a Donors' Fellow of the Institute studying the use, misuse, accretion and depletion of fresh-water supplies in southern Africa.*

## *Potty (Re) Training* **Water Scarcity Changes How Africa Pees and Poops**

James G. Workman

OCTOBER 2002

JOHANNESBURG, South Africa—Richard Holden, technical manager of Mvula Trust, Africa's largest water-services nongovernmental organization, reaches the crux of his mouth-watering argument just as the waitress arrives with lunch. This is the second meal I've shared with Holden; he is smart, engaging and articulate and, as usual, talking a complete load of crap. Mine, as it happens.

"Look, if you don't want to handle your own feces that's perfectly fine," he says, much to my relief because like most people I'd really rather not. "But —" *But? Why must there be a But?* "But if that's the case," he continues, "you had better be prepared with money, skilled labor, infrastructure and above all cheap abundant water."

Southern Africa lacks all the above, a situation that isn't likely soon to change. True, with political stability, developing nations could raise investment from foreign donors or lenders. With money perhaps they eventually can train workers, who may sooner or later install, maintain and repair pipes and sewerage. But they can't invent water in a dry land. Confronting these undeniable limits, the immediate demand for sanitation and the swelling costs of what little water exists, Holden believes that half the region has little choice but to shift toward 'dry sanitation' in general, and a revolutionary pedestal called a 'urine diversion toilet' in particular.

Skeptical? Yeah, me too. Not merely because my Institute is endowed by Charles R. Crane, the Henry Ford of the American bathroom. I'm skeptical because in my experience humans don't change our ingrained behavior or habits no matter how wasteful, unless our collective ass is dragged kicking and screaming to do so by some intransigent force we can't control.

Yet aridity may prove exactly that force. This strong possibility, thrown down like a gauntlet, has brought me through several countries, five provinces, big cities and remote rural areas across Southern Africa, inspecting various *commodes* or lack thereof. It goads me to ask strangers blunt personal questions about how they answer nature's call. I spend lovely spring afternoons, as is my wont, poring over texts on sludge, touring sewage treatment plants, lingering around conference booths that display alternative plumbing wares, interrupting romantic conversations to marvel about the chemical components of excreta, and, ultimately, discovering and confronting a latent toilet phobia of my own.

Friends and family are understandably concerned; I never used to give a crap about my feces or anyone else's. As my messy rooms and offices testify I've rarely shown symptoms of what Freud called anal-retentive behavior. In those salad days ignorance about amoebic dysentery or *e. coli* bacteria was sheer bliss; I felt confident that with each triumphant flush I was no longer part of the human



*“Look, Ma, no water!” Dry sanitation means what goes in here...*

waste problem. Alas, now, along with 2.4 billion other humans, like those wretched souls in Dante’s *Inferno*, I realize we’re inevitably surrounded by the stuff. But several recent unpleasant truths uncovered during my tenure in Southern Africa may help us find a way out.

\* \* \*

The first unpleasantness is that when it comes to biological functions no man (or woman) is an island unto his bowels. Never mind abstract individual human rights or free speech; we are all equals in one tangible and less exalted respect. Regardless of race, gender, age, religion or how much we paid for our most recent meal, all of us living in South Africa combined release roughly 40 million liters of urine and seven million kilograms of feces each day into nature. If our collective intestines were considered an industry, we’d rank with Chernobyl, Bophal and Dow among the world’s top industrial polluters of toxic waste (as well as certain greenhouse gases like methane). Still we can’t plug or shut down this human ‘factory’ in Africa; its wastes have to go somewhere, with or without water.

The second unsavory revelation is that water may take them the wrong somewhere. Sure, 21 million of us in South Africa sit smugly enthroned, assuming that our daily emissions are swept away by traditional expensive waterborne flush toilets, pipes, septic tanks and sewage-treatment plants to become someone else’s mess. But as has happened from Cape Town to Durban to Johannesburg, the old pipes rust. Gaskets fail. Connections leak. Plumbing ages, gets crowded, clogs, fails, backs up and those who built the system have retired, leaving few skilled workers to deal with the waterborne vector of disease infiltrating the water table above

and below ground. From city sewers to home cisterns, the mess is increasingly our own.

My third grim revelation is that water brings life not just to Africa’s charismatic Big Five game animals, but to *all* God’s creation, including those tiny wormlike intestinal parasites that cripple, weaken and kill us. Ironically, the water we use to get rid of these deadly Microscopic Five actually keeps them alive longer, and provides ideal breeding grounds. What’s more, waterborne disease doesn’t require a broken pipe to spread when the only sewer is the local creek: more than 18 million South Africans, three quarters of them rural, lack even a clean pit to squat over. Small muddy streams and puddles become deadly vectors. Education and treatment can go only so far: one in ten teachers teach students about proper hygiene in schools without toilets or taps, and one clinic in six lacks running water or latrines for the patients. The predictable results – intestinal worms in cities, death by diarrhea dehydration in the country – are so muted, poor, gradual and remote that it’s hard to grasp. Imagine a yellow school bus filled with 100 small children careening slowly, silently off a cliff, twice a day, all year, due to waterborne deaths in South Africa alone. Twice as many, the survivors, hobble off with stunted growth or weakened immune systems.

Looking for this dark cloud’s silver lining, the government cheerfully cites several recent cholera epidemics as “opportunities” because they “have heightened awareness of the importance of sanitation.” Indeed they have. Until last year ‘dirty water’ was ignored from the family to the national level in favor of the top priority: ‘clean water.’ For at least seven years, fresh running water was glamorous and public and hygienic and symbolic; there was no shortage of photo opportunities of officials turning on a new communal tap. Meanwhile Sanitation was Fresh Water’s ugly half-sister who lurked in the gully on the shadowy outskirts of those civic celebrations, neglected and growing sicker by the day, until she grew so



*...comes out here, cholera-free and ready to compost and fertilize*

foul and dangerous she could no longer be ignored. ‘Thanks’ to cholera outbreaks and recognition that more could follow, the pressure to do something fast bubbled up from households to municipalities to cabinet ministers.

Now the two sisters are reunited as equals, almost. Along with the cliché slogan “water is life” on national posters you will find the new afterthought “...and sanitation is dignity.” I attended Africa’s first conference exclusively devoted to Madame Sanitation in late June, whose organizers hoped to give her a starring role in the World Summit on Sustainable Development (WSSD) two months later. That proved no mean feat. (It’s easy to find celebrities to champion rainforests, Third World Debt or global warming, but for some odd reason the likes of Sting, Bono, or Leonardo di Caprio shy away from promoting proper ‘feces handling.’)

But the economic rationale was as compelling as moral arguments. Studies showed that the returns on investment of improving water quality and sanitation together are three times higher than fresh water alone. So if wealthy rock stars shied away from sanitation, cash-strapped officials and bureaucrats embraced it. Indeed, the Summit’s most innovative press-grabbing social marketing came as toilet paper with messages on the sheets, with some brave water experts being interviewed in the men’s room, sitting on the can.

\* \* \*

It worked. While failing elsewhere, the rather spineless WSSD delegates indisputably succeeded in raising the profile and urgency of dealing with sanitation and fresh water together. The ‘Johannesburg Declaration’:

- 1) Strengthened consensus that water is a precious finite resource best conserved when people, cities, industry, farmers pay for it through user fees, metered and tiered water pricing, cost recovery etc.
- 2) Agreed to pledge hundreds of millions in aid funding to cut in half the billions of the world’s population living without adequate sanitation by 2015.

South Africa provides a neat microcosm of these two forces. First, its recent consensus-drafted, widely-circulated and Department of Water Affairs and Forestry (DWAFF)-sponsored white paper enshrines “sanitation [as] a human right, and municipal responsibility,” and allocates \$30 million a year to help municipalities elimi-



nate the backlog (of bringing toilets to 18 million people) by March 2010. Second, it recognizes that water has economic value and that costs of using water at home and in the city will continue to rise.

Taken in isolation, the two abstract agendas mark real triumphs at the global and national levels. Taken together, the two become a recipe for disaster. The linked halves of H<sub>2</sub>O — paying increasingly more for a smaller share of water supply at the same time as requiring more toilets that cause water demand to skyrocket — show a dangerous First-World bias. Promotion of more and more flush toilets and waterborne sewerage could only be the work of people who typically grew up in cities, lived in rainy nations, were sponsored by wealthy governments who could subsidize the needs of people — and spend their days in offices, hotels and conference rooms equipped with urinals and bidets.

That world is a long way from here. Walking the traffic-free, run-down, post-Summit streets of Johannesburg after these delegates have continued along the global conference circuit, Holden and I (and 18 million others) are left facing the inescapable local legacy of the global Summit: To meet targets and donor requirements, governments are duly racing ahead, subsidizing housing for its poorest citizens. To meet profits, private contractors duly equip each new home with a shiny flush toilet, and then leave it to the municipalities to provide pipes, connections and water later on. This triple subsidy is short-term madness, notes Holden. In a dry, poor, water-stressed nation with high unemployment and local governments thrashing about to stay afloat, Charles R. Crane’s porcelain throne becomes a Cadillac in a land without gasoline or roads: a beautiful, comfortable, plush status sym-



*VIP Suite for One, Great View. A technology born and bred in Southern Africa.*

bol whose proud owner can't drive anywhere. In short: *The region is rapidly installing millions of toilets where no one has, or will ever have, the water or money to flush.*

Uh, oh. The issue is not limited to Southern Africa; meeting the WSSD sanitation target will require that the world invest at least 50 percent, or \$8 billion, more each year in water-related infrastructure. In these places, money is as scarce as water. "Most still feel that only a western-style flush toilet is the ultimate solution – for status and so forth," Holden acknowledges, while shaking his head. "It's a symbol that a family 'has arrived.'" But the high cost of installing and maintaining flush toilets and sewers rules this out in many settlements."

How many? Wherever the area is too dry, too poor and too incompetent to manage such infrastructure, it seems. That's most of the subcontinent. But *sans* flush, what's the alternative? The answer depends on a messy mix of personal tastes, capacity, economics, geologic limitations, taboos and phobias of each region, place, culture and family. Ideally, families are given choices. But their answers, after reading the bottom line, essentially depend on access to, and rising cost of, water.

\* \* \*

Ironically, until the last century, sanitation was never a massive health issue for most of southern Africa. While crowded cities in Europe and North America and Asia had long struggled with the risks and come up with technological means of isolating and disposing of human waste, densities here were such that Africans for the most part just moved from place to place in relatively small numbers. Holden explains: "A simple hole in the ground, where the feces is covered after deposition, will suffice so long as children or animals do not disturb it afterwards. The system is safe, reliable and can

be handled totally at household level."

Even today in the Kalahari, Bushmen clan settlements face many challenges — food, liquids, communications, medicine...but not sanitation. Despite the lack of plumbing or even outhouses, there is no water-borne disease because there's no surface water. The Kalahari is a big sandbox — kitty litter for lions and humans — and absorbs anything moist within seconds, drying it out and, more importantly, killing its living organisms.

But the growth of densely populated African cities and the vanishing of Africa's nomadic rural pastoralists and hunter-gatherers irrevocably changed the rules. When Bushmen move, or are forcibly removed, to 'developed' camps, the first thing they have to learn is how to urinate or defecate in one place, and in

proximity to thousands of others. Like other Africans, they also must now do so without privacy. Among the many problems of deforestation for fuelwood around Africa's villages (erosion, biodiversity loss etc.) add this: there are no longer trees or bushes behind which to squat.

As a result, people use plastic buckets in their huts. This has obvious drawbacks, from smell, to flies, to safe disposal, and has increased the demand for 'real' latrines. As a contrast to the arid, empty Kalahari, I began to explore the wetter and more densely populated yet predominantly rural mountain kingdom of Lesotho, where in 1981 only one in five had any sort of sanitation (50 percent in urban areas, 15 percent in rural). Rugged Lesotho has high rainfall, and is laced with rivers, but as one of the ten poorest nations in the world cannot afford to install water-borne sewerage. Its answer over the last two decades: a nationwide campaign to construct 36,000 structures using a then-new, low-cost African technology that has altered the face of sanitation worldwide.

It is called the Ventilated Improved Pit (VIP) latrine, born at the Blair Research Laboratory in Harare, Zimbabwe in the mid-1970s. At first glance, you think: "Just an outhouse." Then you notice the long-drop is slightly off-center, and it has a stovepipe and vents on the front end, plus a fine mesh screen. The revolutionary difference isn't that airflow makes it smell better; offensive odor is secondary. The magic is that contagious and breeding flies are diverted, trapped, excluded or confused. Over three months, researchers caught only two flies per day in the VIP latrine, versus 179 flies per day in a typical outhouse. Counting flies each day for three months might seem dull if the consequences of these primary disease-vectors weren't so lethal.

That technology – exported around the world to Asia

and South America — is a novel one that Africa can take pride in. Unfortunately it is not a one-time-only process. VIP latrines from Zimbabwe to Mozambique to Lesotho still face economic and logistical problems. One is that VIPs remain relatively expensive for those who need them most; the best functioning designs require brick, stone, cement, mortar and steel — materials that cost some families several months' wages, even in areas where they are available. While this can be overcome by donor-aid and government subsidy, a second problem is that all pits, even "new, ventilated and improved," fill up fast.

When they do, they must be sealed over or emptied. Sealing requires installing another new VIP latrine, doubling all the expenses and delays and complexities that go with it. In Zimbabwe today, on top of famine, free-roaming 'war veterans' and a worthless currency, I learned that the nation that pioneered the VIP has filled most of the first ones to the brim, can't empty them, and can't afford to build new ones. Granted, its economy is in the toilet, but Zim is not unique in its toilet-economy challenge. Emptying VIPs anywhere requires special vehicles, including suction tankers, that get blocked by non-human waste, can't reach places without good roads, break down through overuse, and require water for dilution, like septic tanks.

A proposed solution was to build ventilated, improved "double-pit" latrines, where the second pit can be used as the first dries up or "matures" over three to five years and can be emptied by the household. But so far that works mainly in theory, and in ideal dry environments with low water tables and flat surfaces. This leads to other problems. The floor of a double VIP must be constructed 1.5 meters above ground level. "This exposes the user to the world," notes Holden, "and has proved to be socially unacceptable." And while the VIP requires darkness to divert flies toward the light, some rural tribes, as noted in Mozambique, find it culturally inappropriate to defecate in a roofed building. VIPs, it turns out, proved to be just one inexpensive alternative to the flush toilet or septic tank. If merely extends the disposal problem from minutes to years. It keeps urine and feces closer to home, and delays the need for water to carry waste away, but does not 'close the loop' or take dry sanitation to the next, perhaps ultimate, level.

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Sanitation's political pressures are greatest in cities. Of those cities, none feels the pinch worse than Cape Town. No part of the Mother City sprawls more danger-

ously than the sprawling, crowded, nonwhite ghettos collectively known as the Cape Flats. And in no section of the Flats are people more vulnerable to sanitary breakdown than Khayalitsha, where this lily-white correspondent is searching for a toilet. As I wind through the dusty streets I pass groups of schoolchildren wandering home on lunch break. Some are laughing, most stare at me curiously. I wave back but my smile fades as I recall that intestinal worms afflict 19 out of 20 of them. After apartheid fell and squatters swarmed into the cities, the schools here were the only areas with open fields; those spaces rapidly filled with Africa's poorest, living in shanties. The city can't afford new infrastructure for these poor urban immigrants, so they relieve themselves on the school grounds.

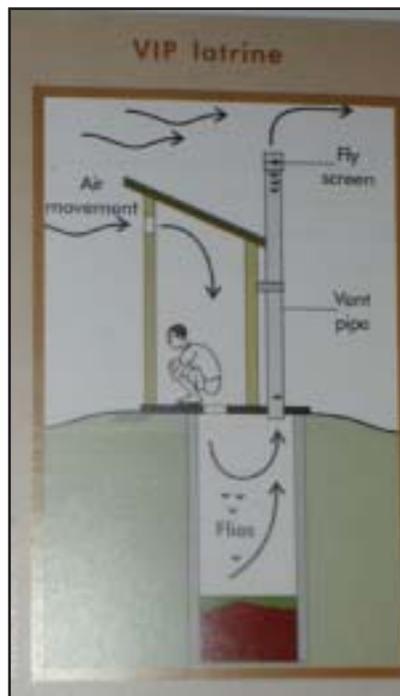
Caught smack in the middle of this no-sewer-zone is Nonzwakazi Nokhwe, 40, who came from Tsomo, in the Eastern Cape Transkei region, four years ago and decided to stay. She has four children in school who are at risk of worms, and two older ones looking for work, but the family also must share a single shack with no toilet. I pass communal portapotties on my way to visit her, their doors fastened with padlocks.

When I ask about these she makes a face in disgust. "They are obscene," she says in Xhosa. "Dangerous, inconvenient, not private, and as a result that no one cares for them they are covered in shit, all over the walls."

I assume that she means dangerous in a sanitary context. But later I learn the truth is that they are dangerous at night, when a lone woman walking after dark risks being raped, or worse, *en route* to the john. Either she holds it in until daylight, or uses a bucket. Mostly, Nokhwe held it in, and hoped that a neighbor a few blocks a way with a conventional flush toilet would let her use that until something better came along.

At a community meeting she attended in January, she learned that Holden's Mvula Trust NGO was piloting a new kind of toilet that did not need to be hooked up to expensive sewage systems. It sounded strange, but with nothing to lose, she quickly volunteered. To ensure sustainability, such pilot ventures require some investment 'stake' by the household, either in money or labor. Learning that the pedestal was en route, Nokhwe assembled the toilet 'superstructure' (a shack) herself in two days, using left-over wood and materials from a neighbor who moved out. She carved space for it in an open square meter and erected it herself. Then came the centerpiece.

It looks like any toilet, but just as the name implies,



*The VIP is a simple design with complex functions, but there are still a few bugs in the system.*

it diverts urine into a container while feces fall into the pit below. A mixture of soil and ash is thrown down into the pit to help kill off the pathogens and dehydrate the feces, as might happen in the Kalahari. The pedestal is made by using a fiberglass mould into which a sand-cement mixture is cast. The cost is 30 Rands (\$3.50) if made by the household. "I prefer urine diversion because it doesn't smell," says Nokhwe. "When the toilet is full I don't mind taking out the feces because it looks just like manure. I am delighted because this toilet is mine. It doesn't smell, and it's much healthier for my family."

"Would you rather have a flush toilet?" I ask.

"Sure," she answers. "If I could afford that someday, that would be ideal, but with conditions as they are now, I'm more than happy with what I've got. It would be selfish to want more."

Then she adds something that hints at the universal nature of humans, upwardly mobile, but wanting a sense of permanence in our temporary stations en route to something bigger and better. She feels the opportunities in the Cape are better than in the Transkei, at least for her children. But she didn't feel satisfied just to have a shack around them. It wasn't quite home, for it lacked lasting foundations. The Porta-potties came and went, hauled in and out of the squatter camps. But with this installation, she feels she does have pride and self-esteem in her place. She belongs. She has new roots. The difference is that a toilet of her own has now been installed, and, she adds, "it's permanent."

Like the VIP, the urine-diversion toilet still has a few



*"If it's yellow, let it mellow..." (in this watering can that will be sprinkled in the garden once a week)*



*A private room of one's own. Nokhwe: "It would be selfish to want more."*

bugs in its system. A spring rain blew some drops of water down the air vent at the top and kept the feces wet; that leads to anaerobic decomposition, instead of aerobic, which made it smell and turn unhealthy. Also, some sand seems to have clogged her urine-diversion pipe. The technology is new, and being piloted, but neither of these problems are technologically or economically insurmountable.

Indeed, others in her immediate community don't seem to have problems with it, and are curious that it doesn't smell (a matter of dry aerobic vs. wet anaerobic breakdown). If anything, some are envious that they did not take advantage of the opportunity themselves, and plan to next time 'round. They haven't asked to use it, but if they could carve out the space, like she did, several neighbors would like one as well.

At some point, say proponents, if the urine-diversion toilets start to gain ground, the school's open spaces can once again be used to play in, or even enriched and fertilized and grow vegetables and flowers with the now-sanitary recycled wastes coming out of the squatter camps. That's still a ways off, concedes the local sanitation-project manager, Johannes Mokgatle. "People are understandably afraid to use feces that they have learned are carriers of disease. Now we need to educate them why, if treated right and dried, these wastes can be clean and useful."

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Nokhwe's neighbors aren't the only recent converts. Elsewhere, the urine-diversion toilet has gained political acceptance at the top of the ladder. One year ago in the arid and poor Northern Cape, Provincial Premier Manne Dipico endorsed dry sanitation as *the* solution in the eradication of approximately 25,000 buckets in the province.

His endorsement recognized that the province has neither the water nor the financial capacity to sustain water-borne sewage for all its inhabitants.

Some political converts, like newly reformed smokers, are running way ahead of these pilots. After investigations into the technology, several Durban Water Services officials decided they wanted to start installing urine-diversion toilets everywhere. Ironically, Holden persuaded them not to do so. Not yet anyway. "You can't — and we won't — force this on people who aren't ready for it, or they'll make it fail. You need a motivating factor, like aridity in the Northern Cape, or the cost of water — and then let people come to it voluntarily, on their own."

This is why the technology is, for the time being, most readily embraced by the poor. And among poor, most readily adopted by women. For them, the cultural and social barriers of urine diversion are lower than the risks of rape, disease, or public exposure. Nokhwe says she doesn't mind handling dry feces. Nor did Marietjie Meyer of the Northern Cape, in whose government-built house the flush toilet had no water or sewer. Indeed, it seems only African men have a problem with this, since the women have been handling feces — wet and messy, their own or others — for years. Women take care of babies before they are potty-trained, changing diapers. And they take care of the elderly, after sphincter muscles weaken. Handling dry feces, these women say, is by comparison a vast improvement.

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Even as I grow impressed at such complex yet simple technology, there is a philosophical part of me — call it scatological eschatology — that wonders whether urine-diversion toilets will simply languish as "the poor person's toilet." Status is a powerful force for change or for foot-dragging. The only no-flush systems I have come across in Scandinavia and America (where there is plenty of water and a high standard of living) are in fact hugely expensive status symbols flaunting green self-righteousness. But if necessity is the mother of invention, 50 percent of South Africa is increasingly willing to experiment with closing the loop. Not because it's 'green,' but because it's affordable and improves their lives. For that reason, politicians, consumers and contractors are starting to ask not whether urine diversion will remain second-rate, but whether drinking water will become too precious to flush. With the price of household water rising across the nation (in some places now costing \$1.25 a cubic meter), I wondered: Would urine diversion make sense even in middle and even upper class communities?

Holden wondered as well. By way of answering himself and his critics, in February 2001 he retrofitted his century-old home in Bellevue East, Johannesburg, to dry sanitation. It meant cutting himself off from sewers, recycling greywater (bath, sink and kitchen drainage), and diverting the waste into the garden in order to save money

and keep up a high standard of life. Installation cost 1,000 Rands (US\$125), an investment that has been repaid in savings from municipal fees.

He gives me a tour of his house, showing the urine container, a watering can that is sprinkled each week into the compost heap and around the garden. And the feces? He removes them every six months from the rear of the toilet, a 15-minute operation, adding them to a compost heap where heat destroys any lingering hardy pathogens, such as worm eggs. At first I wondered if Holden was another eco-topian, ready to sacrifice his family and quality of life at the altar of his career and ideology. But I came away knowing a regular Joe who can't stop bragging about his garden, his vegetables, and how disconnecting from sewerage not only re-connects him to cycles of seasons, but affords him and his wife a bonus vacation down to the Cape.

Class differences aside, Holden's pride in his system parallels Nokhwe's in terms of permanence and belonging: a sense of improved place. When we came to the bathroom, he was only partly joking when he flipped on the lights with a flourish and trumpeted, "*Voilà! La piece de resistance!*" I stared at it for a few moments, took a few photos, sniffed a bit and reluctantly had to concede that while there was not a Glade air freshener in sight, none was needed.

Searching, like any skeptical journalist, for ways to criticize, I noted. "It seems a bit low to the ground."

"Yes," he answered. "But my wife likes it better that way, and we find that lower pedestals make people squat, and spread their cheeks for a neater deposit." *Boy, these sanitation guys think of everything.*

"What about when you have, um, indigestion?"

"Just throw down a bit more ash. Believe me, I've done everything possible in this toilet, sick or healthy,



*"If it's brown, flush it down — no, wait, let it mellow too!" As the price of water rises, urine diversion turns from 'second rate technology' to a status symbol of the savvy*

both ends." *Hmm. Thanks for sharing*, I think. But there is a relentless candor in his answers that makes me laugh; Holden does practice what he preaches.

Alas, at this point my bladder is bursting. "May I take it out for a spin?" I ask, nodding at the flushless contraption.

"By all means, be my guest," he says, leaving me alone with this contraption, after adding. "There's nothing special about it."

But when he closes the door I find there is indeed something special about it. After months of learning about other people's reservations and phobias about alternative sanitation in Africa it is time at last to confront a toilet taboo of my own. Some Africans don't like burning toilet paper, or squatting under a roof, or sharing with others, or handling their own desiccated feces, or using urine as fertilizer, or sitting on a platform 1.5 meters off the ground. Having seen the water-scarce pressures at work, I think I can get past all those issues myself. I even think that urine-diversion will in fact be a growing force of change in the years to come, not just among the urban and rural poor, but also among those, like Holden, wanting to save on their skyrocketing water bills.

But there is one big problem troubling me, now with the door locked and no one around. I realize that to pee in this thing, one must sit down. That may seem a minor issue to women (even a blessing to those who argue endlessly about who left the toilet seat up or down, not to mention wisecracks about how poor men's aim is). But I suspect every real man reading this will nod in quiet sympathy.

I don't consider myself a misogynist. But I have noted that women seem to be gaining (slower or faster, depending on your patience) economic and political clout almost everywhere you look. At this moment I recall my 8<sup>th</sup>-grade *Annie Get Your Gun* duet – "Anything you can, do I can do better.." Two decades later I've come to recognize that, on balance, women *can* in fact do everything better than men. From US soccer teams to reasoned political debate, to business networking and even to producing genetic offspring without us, we men seem to be finding ourselves increasingly marginalized, if not redundant.

So it is that despite failing ubiquitously, we can at least take pride in our ability to pee standing up. Anywhere. Anytime. Standing tall, chin up, firm footing, breeze in the hair, one hand on hip: it is the ultimate male-bonding posture of international brotherhood. Let the fairer sex bend their knees or find a bush, We Who Will Not Kneel just need to face downwind and relieve ourselves before the glory of the Almighty. But now, here, in this Johannesburg room, I find the epiphany that the future salvation of water and sanitation in Southern Africa, if not the world, requires that I sit down just like the female of the species. One last thing they can do better than we? It seems a cruel joke.

I try, and after a few minutes of stage fright, succeed at emptying my bladder. It is my small contribution toward rescuing Africa's biodiversity, infrastructure, scarce funds, need for nitrogen-based fertilizer and acute regional water shortages. But I can't say I like it. When I emerge, I share this insight with Holden, who nods knowingly, but says nothing.

"There must be some way around this sitting-down-to-pee stuff," I grumble. "When I was young my father imbued me with the principles of positive use of urine, what is today called 'closing the loop.' But that just meant we would go over and, as Dad said, 'fertilize the rhododendrons.' They bloomed beautifully, and we cut out the humiliating middle step that this diversion toilet requires."

Holden looks around furtively for eavesdroppers. Then he leans toward me and lowers his voice. "Listen, don't tell my wife, because she'd get mad. But when I'm out working in the yard, and no one's around, *that's exactly what I do.*" □

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Phone: (603) 643-5548  
E-Mail: ICWA@valley.net  
Fax: (603) 643-9599  
Web Site: [www.icwa.org](http://www.icwa.org)

Executive Director: Peter Bird Martin  
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