

EVERYDAY KILLERS Series in the New York Times

It is good to be reminded why cold fusion is so important. The *New York Times* recently published a two-part series on Third World health problems titled “Everyday Killers,” by Nicholas D. Kristof:

Malaria Makes a Comeback, And is More Deadly Than Ever, January 8, 1997
For Third World, Water Is Still Deadly Drink, January 9, 1997

The first article reports that malaria kills between 1 and 3 million people every year. The numbers are unclear. Most of these deaths could be prevented by sleeping under mosquito nets. A \$5 net impregnated with insecticide can cover several people. The article describes the horrifying predicament faced by many parents:

Mrs. Nhem Yen, a Cambodian villager, has one small mosquito net – and that is the source of her anguish. A 40 year old woman with thick hair brushed to the side around a high forehead, Mrs. Nhem Yen has five children and two grandchildren in her little hut. Every evening she must figure out which children sleep under the net, and which sleep outside the net and risk death.

“It's very hard to choose,” Mrs. Nhem Yen said softly, her children clustered around her. “But we have no money to buy another mosquito net. We have no choice.”

The *Times* says the World Health Organization recently declared that the mosquito is “public health enemy No. 1.”

Cold fusion cannot directly contribute to controlling malaria. It might make people richer so they have more money to buy mosquito nets, screens, and medicine. But it can help directly with the other great public health crisis: unsanitary drinking water. This causes widespread illness and death. It kills roughly 3.5 million people per year, mostly children. This is approximately 68,000 victims per week, more than the total number of U.S. soldiers killed in the Vietnam war. The biggest threat from water pollution is not industrial waste, it is disease from human waste. The article concludes: “All in all, human wastes may be more menacing than nuclear wastes, for feces kill far more people than radioactive substances.”

Almost all of water borne diseases could be eliminated by boiling the water used for cooking and drinking and by cooking foods more thoroughly. Better hygiene would also eliminate them, but boiling will work. Unfortunately, for a family of four in India, the kerosene required to boil the water costs about \$4 per month. Many poor families earn less than \$20 per month, so this is much more than they can afford.

Cold fusion might ameliorate this problem by giving people cheap energy to boil drinking water and cook food. If a high-temperature cold fusion device could be made as cheaply as a kerosene burner or electric stove, it could save millions of lives every year. Boiling water is a work-around. It is not as effective as proper sanitation. As the article explains, “billions of people in

the third world don't have access even to a decent pit latrine." In other words, in many parts of the world shovels would do more good than either kerosene or cold fusion. Latrines or septic systems would be a great benefit on land with good drainage and percolation. Concrete lined cesspools can be effective. The next step – to water pipes, sewers, and waste treatment plants – costs far more than poor third world communities can afford.

Whether you use kerosene or cold fusion, boiling drinking water is a stopgap solution to the problem. It depends on the initiative of individuals. A mother might conscientiously boil drinking water, but when she is not around the children may not bother. It is far better and more efficient to secure a source of pure water for the whole neighborhood or village, and to drain off sewage. On the other hand, the ad-hoc one-at-a-time method of boiling water is good because it allows individuals to solve the problem on their own, immediately, without depending on community action. It fits in well with the "micro-loan" model third world assistance programs, which were pioneered by organizations like Oxfam. Until the 1980s, most foreign aid dollars were spent on large, centralized projects like dams and factories. The money was often channeled through local government agencies, which often wasted it because of corrupt and inefficiency. A micro-loan program is a bank that loans small sums of money at low interest directly to individuals and families, sums small as \$10 to \$100 in many cases. The only other sources of credit for most of these people are usurers and pawnshops. People use the loans for their farms and businesses, for things like chicken feed or a sewing machine for a tailoring business. The credit rating of these third world borrowers is excellent. They are extremely anxious to pay the debts on time, because their lives depend on maintaining a line of credit, and because they often have an old-fashioned sense of honor. This is illustrated in the first article, which describes why one family does flee from an area where malaria is endemic:

It is not just that her husband has a job there cutting wood and thus the family has food to eat, or even that the family's entire savings – \$4 – were spent when they moved here in April. Rather, the problem is that the family puts honor above all else.

One of the couple's four sons, Rathna, a year-old who was scampering naked around the hut, nearly died of malaria a couple months ago. Mrs. Chim Savan managed to save his life, but only by borrowing \$22 so that he could spend a week in a hospital for a blood transfusion and other treatment.

So now the parents have saved Rathna, but they feel they are honor-bound to stay in the village until they can repay the \$22 to the woodlot owner, who lent them the money. The risk is that in the meantime their other children will die.

"If I weren't in debt I would leave," Mrs. Chim Savan said. "But when we were in trouble, the owner helped us, so now we have to help him. Because he was good to us.

The *Times* praised the micro-loan movement in an editorial on February 16, 1997, "Micro-Loans for the Very Poor." It reported that eight million people are now getting them, about half in Bangladesh, and in 42 other countries. About \$1.2 billion is lent, which is 2 percent of world's third world development budget. The Grameen Bank pioneered micro-loans. It lends to small

groups of people rather than individuals. The *Times* reports that loan recipients “pledge to boil their water, keep their families small and carry out other good health practices. People who repay small loans on time can take bigger ones.”

The Hydrosonic Pump Might Help

The Griggs Hydrosonic Pump is another interesting low tech solution to this problem. This device appears to produce excess energy, but not enough to be economically significant. That is irrelevant to this application, in any case. The Griggs machine is now being sold primarily as a device to boil and purify waste water in U.S. factories. It is better than a conventional boiler because it does not clog up as easily. The temperature of the machine as a whole is no hotter than the fluid inside it. With a conventional electric heater or external flame, some parts of the boiler housing get very hot. Scale and debris from the boiled water builds up at these spots. In the third world or in a rural U.S. location the Griggs machine can be driven by a windmill or waterwheel.

A Vicious Circle

People who are sick all of the time do not have the energy to work, or dig latrines, improve their neighborhood. They spend what little money they have on expensive, stopgap fixes like medicine and kerosene to boil water. The article describes this vicious circle:

“We have no blanket, no medicine and not enough food to eat,” said Soy Phal, 31, a Cambodian who is herself feverish with malaria and whose husband died of the disease three years ago. “How can I afford a mosquito net? I spend my life being sick, so I have no time to earn money to get a mosquito net.”

Ignorance Is Often the Real Problem

Ignorance causes much of the suffering. Children have no idea that filth causes disease. The article opens with a scene familiar to anyone who has traveled in the third world, although it is unthinkable to Americans and Europeans:

Children like the Bhagwani boys scamper about barefoot on the narrow muddy paths that wind through the labyrinth of a slum here, squatting and relieving themselves as the need arises, as casual about the filth as the bedraggled rats that nose about in the raw sewage trickling beside the paths.

Adults realize that this causes disease, but they are not convinced of the fact enough to discipline their children, or to dig proper latrines. In some urban slums there is not enough room, but that is not a problem in rural villages, yet in many of them water-borne diseases are endemic. Many crowded Japanese towns and villages today have no running water or sewer systems. (At least, they still do in rural Yamaguchi, where I often spend my summer vacation.) Houses are equipped

with concrete cesspools only, which were emptied by hand until the 1950s. Yet there has been no water-borne disease in these villages in modern times.

For those who have forgotten why science is so important, the article illustrates the curse of superstition and ignorance:

. . . because of his lack of education, the money is wasted.

The most recent child in the family to fall seriously ill was Tatu, Mr. Simba's 18 month old daughter, who in September began to come down with severe diarrhea and fever. Mr. Simba took her to the local traditional healer and without question handed over the huge sum of \$20, along with a chicken, and \$8 worth of cloth used for the magic.

The healer put Tatu under the bed and had her mother squat on top of it and urinate, drenching the child. Then the healer burned elephant dung and had the child breathe the Fumes.

"Usually it helps," Mr. Simba said dejectedly. But not this time, for Tatu died. Mr. Samba aches at the loss of a sixth child, yet he continues to offer his family the same water.

Cold Fusion No Panacea, but Better than Alternatives

No technology is a panacea for social problems. But, if it is used intelligently, cold fusion can help alleviate third-world poverty. Anything which directly raises the standard of living of the poorest people will help. People need breathing room. They need respite, so they can get back on their feet and work. Whether cold fusion is used to help poor people or not will depend upon policies set by the politicians, industrialist leaders, and approved by the voters in democratic nations.

Technology does not help people automatically, just by existing. We already have technology that might have lifted every person on earth out of abject poverty decades ago, at no cost to the developed nations or to wealthy people in the third world. Mosquito netting would eliminate almost all cases of malaria, and shovels could eliminate most serious problems with the water supply and sanitation. It would cost us nothing to supply poor people with nets and shovels. Indeed, you could make a reasonable profit selling these things. You have to give away some of the nets. You have to lend many of your customers small sums of money (micro-loans) to purchase the nets. But, by ensuring their long-term good health, you would reap a profit millions of times greater than cost of the nets and shovels over the productive lifetime of the people whose lives you save. The problem is that the leaders who have the means to solve these problems, and set up hardware stores in third-world slums, do not want to bother. In the short term, it is not very profitable. The poor people have not taken the initiative to dig their own latrines with whatever tools they can scrape together at hand. There is plenty of blame to go around, just as there are many potential solutions.

We hope that cold fusion reactors can be made small, reliable, and cheaply, for use in a single house. A small cold fusion power and heating reactors would be much better for third world customers than alternatives like large-scale fission and plasma fusion reactors. Cold fusion reactors are potentially cheaper per watt of energy, because they are simpler, they use cheaper material, and they do not produce massive, ionizing radiation, so they do not require massive shielding. They will not need a centralized distribution network of power lines and wires, which does not exist in many third world countries. The biggest advantage would be that individual people will decide for themselves to buy the reactor. People will not have to wait for corrupt governments or power companies to serve their needs. They will be able to solve their own problems, just as they do today with micro-loans. We hope that someday, small cold fusion reactors will be as cheap as a kerosene stove is today. Or if they cannot be made that cheaply, we hope they will cost about as much as a television or a motorcycle. These items are extremely popular and useful to people the third world. Even in Japan, farmers routinely carry eggs, fish and crates of oranges on the back of motorcycles.

Once people raise their standard of living, they usually pay more taxes and begin asserting their rights more vociferously. Governments and corporations then pay more attention to their needs. Perhaps people can begin by boiling drinking water, so they stay healthy, work, and go to school. Then they can make a little more money and eventually be in a position to demand that the local utility companies build proper sewers, which are a much better long-term solution to the problem.

Cold fusion is a good example of what has been called “small technology.” A great deal has been written about “small” or “appropriate technology.” versus “big technology.” This was popularized in a book by E. F. Schumacher, *Small is Beautiful* (1973), and by Amory Lovins, “Energy Strategy: The Road Not Taken,” *Foreign Affairs* magazine (October 1976). Much of this strikes me as misguided or unworkable. Small technology in the form of automobile engines and wood-burning stoves are major sources of pollution and deforestation. The problems with Schumacher’s book were summed up in a masterful essay by Samuel C. Florman, “Small is Dubious,” in his book *Blaming Technology* (St. Martin’s Press, 1981). The distinction between big and small technology is somewhat artificial. Automobiles, motorcycles and bicycles are small decentralized machines in one sense, but they require good roads, which can be thought of as massive machines, and which require strong central government coordination to build and maintain. Small, personal computers require the largest, most expensive, multibillion-dollar microprocessor and memory chip fabrication plants ever built. Personal computers have concentrated monopolistic power in the hands of Microsoft and Intel. In spite of the problems with the thesis, it does contain a grain of truth. There are times when many small machines can replace large, centrally located ones, and do a better job. Cold fusion looks like it may become an ideal example.

[SIDEBAR]

The *Times* listed some statistics for the most common water borne diseases:

Diarrhea	3,100,000 Deaths per Year
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Schistosmiasis	200,000
Trypanosomiasis	130,000
Intestinal Helminth Infection	100,000

Total: 3,530,000

Sources: World Health Organization, American Medical Association, and the Encyclopedia of Medicine.