

Poverty, Malnutrition and Worms

The great American theologian and preacher, Jonathan Edwards (1703–1758), once declared: “A little, wretched, despicable creature; a worm, a mere nothing and less than nothing; a vile insect that has risen up in contempt against the majesty of Heaven and earth.” The condemnation seems a bit excessive; and perhaps would be more appropriate for the bubonic plague-carrying louse; certainly that lowly invertebrate creature, the earthworm, that earnestly feeds the robins in spring and aids the fisherman in his riparian pursuits, doesn’t deserve the full homiletic wrath of the Reverend Edwards.

And yet, did the Reverend know something about lowly worms that his 18th Century audience failed to grasp? Did he know, for example, that by the 21st Century, well over a billion humans would be chronically afflicted, encumbered with enduring diseases caused by worms parasitizing their bodies?

There is a parasitic worm called *Ascaris lumbricoides*; and as its species name indicates it is remotely related to the ubiquitous but innocent earthworm. *Ascaris*, however, reaches lengths exceeding 12 inches and over the millennia has adapted itself to a precarious dwelling within the intestinal tracts of humans. To get there, however, the *Ascaris* worm begins its life cycle by its fertilized eggs—of microscopic dimension—surviving in top soil.

And how did these many *Ascaris* eggs get there? The Western world is so civilized that it refrains from public mention of the unspeakable act of defecation, but not civilized enough to provide private facilities called privies or toilets for about one-fourth of its global population. Accordingly, the great outdoors is the site for this quotidian biological function; and necessarily the topsoil of vast territories is intermixed with what is coyly called night-soil. It should be remembered that the living female *Ascaris* worm, safely dwelling in the small intestines of its victims, generates up to 250,000 eggs per day.

So the process begins with a vast measure of topsoil contaminated with fertile eggs capable of surviving for months particularly in the warmer soil of the tropics. Human contamination begins in an act as commonplace as a foot soiled with earth or a farming hand smudged with soil that may carry these eggs to the mouth. And once within the warmth of the intestines, the latent egg evolves into a small larva that then penetrates the intestinal wall, enters the blood stream to end in the lungs. The barely visible creature then is coughed up, typically at night, and inadvertently swallowed to re-enter the gastrointestinal system to dwell generally within the small intestines. There it grows rapidly by feeding upon the food stuffs within the intestines thus depriving its victim of necessary sustenance.

Most often the victim is a child in villages with neither bathroom facilities nor an abundance of high-protein foodstuffs. The child languishes both physically and intellectually, deprived of achieving his full capabilities by a brainless parasite.

The spectrum of other predatory worms is awesome. There are worms that sneak into the human body by penetrating the soles of bare feet causing profound anemia (hookworm); there are worms that attack the urinary bladder and liver, causing a major tropical disease called schistosomiasis; there are worms that invade the skeletal muscles (in an ailment called trichinosis); and other worms that contaminate the drinking water and ultimately end up as pain-producing dwellers of skeletal muscle (called dracunculiasis); there are worms that attack the eyes ultimately causing blindness (onchocerciasis or river blindness); and even worms that enter the brain developing cysts as harmful and mortal as brain tumors. The variety of pathologic, parasitic worms is extensive; so much so that there is a separate science called helminthology devoted solely to its understanding and perhaps eradication.

It is not likely that the subject of invasive worms will be a leading subject for discussion at tonight’s family dinner in the suburbs of this nation. Clearly, it is a distasteful if not repellent subject.

Are these chronic diseases treatable? Eminently, yes. Are they, preventable? Also, yes. But as long as about one-fourth of humanity remains on intimate terms with abject poverty; as long as most of the impoverished have little familiarity with the most rudimentary of hygienic resources; and as long as illiteracy prevails in vast areas, the parasitic worms will continue their amity with humans. In the prophetic words of Keats, life deprived of life’s bounty is little more than “darkness and worms, and shrouds, and sepulchers.”

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Disclosure of Financial Interests

Stanley M. Aronson, MD, and spouse/significant other have no financial interests to disclose.

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