

# Ancient Parasites Show that Cleanliness May Have Been Next to Sickliness

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Recent bioarchaeological findings at the ancient Dead Sea settlement of Qumran confirm the existence of a strange communal latrine --located at a remote distance, conforming with extreme hygiene practices described in ancient texts and possibly accounting for a documented early mortality rate at the settlement.

The Essenes, a strict ancient Jewish sect devoted to religious purity and linked to the Dead Sea Scrolls, are one of the most interesting and mysterious religious elements in Judaea around the time of Jesus. Recent articles and news stories have questioned long-established scholarship about the Essenes and their relationship to the scrolls, arguing in particular that the inhabitants of the ancient settlement of Qumran, located in the Dead Sea area where the scrolls were found, had no relationship to the religious sect.

Now, new scientific findings from the settlement connect Qumran to details in the scrolls, and give direct evidence of Essene culture at the site. The discovery may also provide a window into dynamic relationships between the sect's rigorous religious practices and the community's health.

A forthcoming report presenting new bioarchaeological evidence from Qumran reconfirms the "Essene hypothesis" by showing the presence of unusual and extreme toiletry and hygiene practices in the ancient community. The evidence points to the Qumran inhabitants' detailed obedience to unique, rigorously demanding precepts that are specified in

Dead Sea Scrolls texts and also documented in a Roman-era descriptions of the Essenes.

In an article forthcoming in the next issue (winter 2006/2007) of *Revue de Qumran*, an international research team reports the results of an investigation of a suspected remote latrine site. Located by following clues in the ancient sources that specify the remote placement of latrines, the team positively identified the site as a latrine area through analysis of sub-surface soil samples.

University of North Carolina at Charlotte biblical scholar James Tabor suggested the investigation at a site outside the ruins of Qumran, noting instructions in two of the Dead Sea Scrolls (the “War Scroll” and the “Temple Scroll”) specifically requiring latrines to be located at a significant distance “north-west of the city,” and also to be “not visible from the city.” Tabor had also noted that the first century Jewish historian Josephus described very similar exotic toilet practices among the religiously strict sect known as the Essenes.

Analysis of the site by Israeli paleopathologist Joe Zias and soil analysis by Stephainie Harter-Lailheugue, a French parasitologist from the Centre National de la Recherche Scientifique, confirmed the area as an ancient latrine site through the presence of desiccated eggs from three distinct human-specific intestinal parasite species. The findings have further implications regarding community health in the ancient settlement.

Visiting Qumran, Tabor noted an area approximately 500 meters to the northwest of the settlement which seemed likely because it was sheltered from view by a bluff. Tabor also noted that the soil in the area appeared to have a significantly different coloration from other soils in the Qumran environs, a fact which was subsequently confirmed by Zias using high-resolution aerial photographs.

“I started thinking that in the scrolls they have these very explicit descriptions of where the latrines have to be,” Tabor explained. “It has to do with religious ritual purity -- the latrines have to be located in a place that the ancient texts designate as ‘outside the camp’. That’s a phrase used in the Torah, where Moses tells the ancient Israelites ‘build your latrines outside the camp.’ When you go to the toilet, take a paddle or a shovel with you and use the toilet and then cover it up,” he said, explaining that the ancient practice appears to have been revived at Qumran.

“This group is very strict and they observe this practice rigorously -- in one text it says go 1000 cubits, and in another text, 2000 cubits -- and they specifically state ‘northwest’ in the scrolls. Josephus, in talking about the Essenes, mentions it as a point of admiration or piety – he says that these people are so holy, that on the Sabbath day they won’t even use the toilet, because on the Sabbath one can’t go outside the settlement,” he said.

“It turns out, if you go northwest from Qumran you get to this bluff – a large natural plateau separated from further cliffs – and if you go around it, it hides you from the camp. One of the things Josephus says is that they also believe that their latrines should shield them from view of the camp, so I thought ‘this is getting really good, if I can just find some evidence for toilet practices.’”

Tabor suggested investigating the area to Zias, who took four random soil samples at the site as well as six other samples for control -- 4 from surrounding desert areas, one from an area that was known to be Qumran’s stable (to test for animal parasites), and one from an area on the opposite side of the city, essentially covering other outside-the-settlement areas that could have been used as latrines.

On the basis of earlier research that has shown that intestinal parasites

can be preserved in arid, sub-surface conditions, Zias sent the samples to Harter-Lailheugue at CNRS for analysis. Three of the four samples from the suspected latrine area yielded four species of preserved worm eggs and embryophores that were all identified as human intestinal parasites – *Ascaris* sp. (human roundworm), *Taenia* sp. (a human tapeworm), *Trichuris* sp. (a human whipworm) and a human pinworm, *Enterobius vermicularis*, that had not previously been reported in the ancient Near East. The soil sample from the stable contained the eggs of *Dricrocoelium* sp., a common parasites of ungulates. The control samples from the surrounding desert areas contained no parasites, human or animal.

“Frankly, I was surprised,” said Zias. “A parasitologist I talked to told me that my chances of finding something were just about nil. Finding evidence of parasites would be easy in a latrine, but in the middle of the desert... But small things like parasite eggs in feces can hang around for thousands of years. At the Dead Sea, we have hair and hair combs with desiccated lice in them because of the dryness.”

“The evidence shows conclusively that the area was a toilet,” Zias noted. “The samples contained eggs from intestinal worms that are specific to humans. These things had to come from human feces. The presence of eggs in three out of four 100-gram samples indicates heavy and continual use of the specific site suggested by Tabor.”

Since the other sites did not yield human parasites, the team concluded that the latrine site was most likely the area specified in the Scroll passages. Because of the remoteness of the Qumran environs, they concluded that the latrine could only be associated with Qumran, the only settlement in the area.

“One possible concern was that the latrine area could have been used by Bedouins, who are known to have been near Qumran,” said Zias.

“However, according to Bedouin anthropologist Professor Aref Abu-Rabia, Bedouins are generally not known to bury their human waste, and fecal matter left on the surface quickly dries up and is broken down by sun and wind. This stuff was certainly buried, as the ancient documents say it should be.”

Zias noted that the heavy daily digging by the Essenes left its mark on the desert in a way that is still noticeable more than 2000 years later.

“I went there and the entire area looked like somebody had plowed it, the earth was so nice and soft, while the rest of the desert was very hard,” he said. “In fact, I broke my pick collecting control samples from the other areas.”

Zias and Tabor also note that the settlement’s unusual latrine practices may be clues in solving some of Qumran’s other archaeological puzzles -- in particular, questions raised by the 1,100 graves found at the site, which are almost exclusively male.

“The graveyard at Qumran is the unhealthiest group that I have ever studied in over 30 years and this is readily apparent,” said Zias, who has done previous work on the Qumran burials. “For example, 2,000 years ago in Jericho, 14 kilometers to the north, the chances of an adult male dying after 40 were 49 percent. But when you go to Qumran, the figure for people surviving to 40 falls to six percent -- the chances of making to 40 differ by a factor of eight!

“And yet we are told that these men arrived very healthy – they had physical examinations coming in. The people at Qumran thought that you could look at body types and tell what kind of person you were. Josephus tells us that the Essenes were selective -- you had to be 20 years old, and you had to be healthy,” Zias noted.

The puzzle comes together for Zias when he combines the community's latrine practices with its near-obsessive use of pools for ritual cleansing and bathing.

“Burying your feces in the outdoors makes a lot of sense until you live in Qumran,” Zias said. “What happened was that 20 to 40 people went out there every day over a period of 100 years. By burying their fecal matter, they actually preserved the microorganisms and parasites. In the sunlight, the bacteria and parasites get zapped within a fairly short amount of time, but buried, the parasites can live in the soil for up to a year. Then people pick up things by walking through fecally contaminated soil -- it's like a toxic waste dump, and if you have any cuts on your feet...”

Well-defined community bathing practices, combined with a lack of running water, complicated the problem of daily exposure to contaminated soil. A cleansing pool was located at the settlement entrance on the return route from the latrine area and is likely to have been a fertile breeding ground for pathogens picked up from the human waste-enriched soil.

“Here is where things really get bad,” Zias explained. “After they went to the latrines they were required to enter one of the emersion cisterns (Miqvot) before they came back into the settlement. Hygienically, that sounds like a good idea, if you have fresh running water, but there is no running water at Qumran, only runoff which was collected during the three months of winter rains. They enter the cisterns where everyone else has been, with all the bacteria they've brought in with them, floating around. The bacterium, which usually doesn't last long in the air and sunlight, stays active for a longer period in the sediments and is continually re-suspended in the water by people disturbing the pool.”

There were other immersion pools at Qumran as well, and Zias and Tabor point out that the Essenes' rigorous ritual purification practices

seem likely to have insured that they too were contaminated by cross-infection.

“People who have cleansed themselves in the outside pool also have to go into the Miqwah twice a day. The water there may looked clean, but hygienically, it was rarely changed and must have been very dirty with the potentially fatal pathogens shared by everyone who was entering it for ritual purification. And Miqwah cleansing is a total immersion, which means that it gets in your ears, in your eyes and in your mouth. It is not hard to imagine how sick everyone must have been,” Zias said.

Ironically, both the rigorous latrine and purification practices, combined with the lack of running water appear to be the most likely causes for the extreme differences in early mortality between Qumran and the contemporary Jericho.

“The people in Jericho were not religious extremists who went into the Miqwah twice a day and they also had clean, running water from the natural springs surrounding the desert oasis. The men in Qumran lived and bathed religiously in contaminated water that had been standing for up to nine months at a time,” Zias said.

According to Tabor, however, poor health might have had its own place in the cultural thinking of Qumran.

“As a group the men of Qumran were very unhealthy, but I think this would have been likely to have actually fed the Essenes’ religious enthusiasm,” said Tabor. “They would have seen their infirmities as punishment from God for their lack of purity and then have tried even harder to purify themselves further.”

Source: University of North Carolina at Charlotte

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