Ain't No Bugs in Me!

May Berenbaum

The human body comes equipped with nine or ten natural orifices—these little portals function to allow light, air, and solid or liquid material to enter or leave the body, depending on biological necessities. Although there are exceptions (which I'm sure, given time, you can probably come up with on your own), movement in or out of these orifices for any given state of matter tends to be resolutely unidirectional. Thus, it becomes rather unsettling whenever the normal flow of traffic is reversed. Drooling, for example, lacks the sensory fulfillment of drinking fine wine, and bleeding from the ears tends to be looked upon by most people with at least some degree of disquietude. Unfortunately for us humans, insects are for the most part, oblivious to these traffic patterns and, thus, occasionally wander into orifices that are not designed to accommodate them.

Not all insects have an equal likelihood of appearing in any given orifice. Cockroaches, for example, appear to have a particular predilection for ears. According to one report (Baker, D. 1987. Foreign bodies of the ears and nose in children. Pediatr. Emerg. Care 3: 67), of 134 foreign objects found in children's ears, 27 were insects, and, of these, 21 (78%) were cockroaches. Although there is a general consensus not only in the medical community but in the world at large that cockroaches do not belong in ears, there is by no means a similar consensus on the best procedure for removing said bodies from said orifices. The usual methods of dispatching insects are, for the most part, not easily adapted to auditory canals—spraying insecticide directly into the ear seems only slightly less unpleasant than putting up with the cockroach, and dealing with the cockroach by stepping on it is just plain unworkable inside a person's head.

Physicians (as the experts to whom people who find cockroaches in their ears generally turn) have, therefore, become increasingly resourceful. Among the most widely accepted approaches is to drown the cockroach lodged in the auditory canal in a fluid of some sort. A remarkable variety of substances have been used to this end, with varying degrees of success. While esoteric solutions involving benzocaine, succinyl choline, isopropyl alcohol, or hydrogen peroxide have been tried on occasion, the more prosaic ether, water, vegetable oil, and mineral oil have a long historical record of use (Leffler, S., P. Cheney, and D. Tandberg. 1993. Chemical immobilization and killing of infra-aural roaches: an in vitro comparative study. Ann. Emerg. Med. 14: 1795–1798). Of these, ether has the decided disadvantage of being explosively flammable and vegetable oil is rarely on hand in an emergency room. In 1980, Dr. A. Schitteck (1980. Insects in the external auditory canal—a new way out. J. Am. Med. Assoc. 243: 331) introduced to an eager medical community a novel approach to the challenge of extricating cockroaches from auditory canals—immobilizing the cockroach with lidocaine spray. Lidocaine spray more typically is used as a topical anesthetic, but, when sprayed inside an infested ear, it has the advantage of rendering a cockroach paralyzed and, thus, less likely to kick and scratch while being extricated.

This new method received validation of sorts when, in 1985, an unusual opportunity presented itself to an enterprising team of emergency room physicians in a large urban hospital confronted with a patient with a cockroach in each ear (O'Toole, K., P.M. Pariss, R. D. Stewart, and R. Martinez. 1985. Removing cockroaches from the auditory canal: a controlled study. N. Engl. J. Med. 312: 1197). They immediately set up a controlled study, using tried-and-true mineral oil in one ear and innovative 2% lidocaine spray in the other ear. While the cockroach that had drowned in mineral oil required manual extraction, the cockroach sprayed with lidocaine “exited the canal at a convulsive rate of speed and attempted to escape across the floor.” In fairness, it must be pointed out that the “simple crush method,” employed by a quick-thinking and “fleet-footed intern,” was ultimately responsible for the demise of the cockroach, but the lidocaine clearly facilitated the process.

The field continued to advance in 1989 when Drs. J. Warren and L. Rotello introduced another method under very stressful circumstance (Warren, J., and L. C. Rotello, 1989. Removing cockroaches from the auditory canal: a direct method. N. Engl. J. Med. 320: 322). Although lidocaine was introduced into the auditory canal according to custom, it failed to have an instantaneous effect. Prompted by the patient's urgent request to “Get that sucker outa my ear!,” the physicians took her at her word and applied a metal suction tip to the opening of the auditory canal; the cockroach was sucked up immediately and removed. These authors made medical history in that, in describing the moment of contact between cockroach and suction tip, they introduced the word “shloop” to the medical literature.

Although cockroaches appear to be the insects encountered most frequently in ears, the same cannot be said for other human orifices. Maggots have a habit of turning up in all kinds of openings, natural or otherwise. Maggots are what turned up, for example, in the urogenital tract of a five-year-old girl in a Tokyo hospital. Some of these larvae came into the possession of R. Disney and H. Kurahashi [1978. A case of urogenital myiasis caused by a species of Megaselia (Diptera: Phoridae). J. Med. Entomol. 14: 717], who attempted to rear them to adulthood. Eventually, these authors tentatively identified the specimens as a Megaselia species. Positive identification was undoubtedly complicated by the fact that, of the two larvae they were rearing, one "escaped"—although the authors do not describe how it was that a legless, headless maggot encumbered by "very conspicuous posterior balloon-like structures" at its nether end managed to make a clean getaway. It also struck me as a curious omission that these authors made no attempt to speculate on how it was that maggots came to live where they did; in fact, there is no indication in the article that the authors thought that the habitat was in any way extraordinary (although they did allow as how they found the specimen "interesting").

Disney [1985. The Japanese species of Megaselia (Dipt, Phoridae) responsible for urogenital myiasis is a new species. Entomol.
Mon. Mag. 121: 261–263] eventually described the specimen as a new species, M. kurahashii, having been supplied in the interim with additional specimens from one Dr. K. Kaneko, although it is not clear where these additional specimens were collected. An earlier publication reports this species as breeding in steechers of Takuwan, a kind of Japanese “pickle made with radishes, rice bran, and salt.” The fact that the species initially found in a girl’s urogenital tract also breeds in pickle brine doesn’t really clear things up for me a lot. For the life of me, I can’t imagine any plausible scenario that connects Japanese pickle brine and urogenital tracts, but perhaps I am just lacking in imagination or suffering from too conventional an upbringing.

I guess I’m interested in how phorids in particular and insects in general gain access to human orifices because, as the possessor of more than a few of these orifices, I would like to take every precaution necessary to keep them insect-free. I’ve always believed that one of the few benefits of living in central Illinois is that one is relatively well insulated against the many forms of arthropod infestation that largely are limited to tropical climates. Human hot flies, jigger fleas, and Congo floor maggots are among the very few things I feel I do not have to spend time worrying about on a daily basis. However, casual interloping at orifices that are left open and inviting seems to have no climatic or geographical boundaries. Badia and Lund (Badia, L., and V. J. Lund. 1994. Vile bodies: an endoscopic approach to nasal myiasis. J. Laryngol. Otol. 108: 1083–1085) describe a case of nasal myiasis, infestation of the nasal cavities, by Oestrus ovis, the sheep nasal bot fly, in a 35-year-old living in London, England. Nasal myiasis is not all that uncommon in tropical Asia and Africa—Sharma et al. (1989) reviewed some 250 cases over a ten-year period (H. Sharma, D. Dayal, and S. P. Agrawal. 1989. Nasal myiasis: review of 10 years experience. J. Laryngol. and Otol. 103: 489–491)—nor is it all that uncommon in shepherds and in other people who, for whatever reason, choose to spend a lot of time around sheep. But this man from London denied having associated knowingly with sheep or traveled abroad immediately prior to the appearance of the maggots. The mere occurrence of these maggots in the man’s nasal passages, however, was not the most remarkable thing about this case; what struck me as truly extraordinary was that this man had been “sneezing out several maggots during the preceding six weeks” before he checked in with his physician. Call me a wimp, but I don’t think I could sneeze out even one little tiny maggot without immediately reaching for the phone and dialing 911.

Although it’s true London, England, is a comfortable 3,000 miles away or so, there’s little justification for complacency here. M. J. Phelan and M. W. Johnson (1995. Acute posterior ophthalomomyiasis treated with photoagulation. Am. J. Ophthamol. 119: 106–109) recently reported an instance of myiasis uncomfortably close to home. A 16-year-old boy returning from summer camp in southwestern Michigan experienced a rapid and progressive decline in the visual acuity of his right eye. Close examination of the eye revealed the presence of “a white, segmented maggot, approximately 1.25 disk diameters in length and tapered at both ends . . . moving slowly in the subretinal space near the equator inferotemporally.” Lidocaine and mineral oil both being out of the question here (not to mention shoe leather), the inventive physicians photoagculated the maggot with an argon laser, treatment end point being a “mild vaporization (bubbling) of the worm.”

From even this superficial and incomplete review of a disturbingly vast literature, I have reached the inevitable and distressing conclusion that nobody’s orifices are safe these days. I really don’t mind that insects might occasionally take advantage of extraordinary circumstances. It’s not all that surprising that a debilitated 80-year-old man in a week-long coma in a hospital in Ankara, Turkey, came to host an infestation of Wohlfahrtia magnifica in his mouth and intubation tube (Ciftcioglu, N., K. Altintas, and M. Haberal. 1997. A case of human orotracheal myiasis caused by Wohlfahrtia magnifica Parasitol. Res. 83: 34–36), and, although I couldn’t actually read the paper, the translated title of Tomita et al. (Tomita, M., Y. Uchijima, K Okada, and N. Yamaguchi. 1984. A report of self-amputation of the penis with subsequent complication of myiasis. Hinyokika Kyio 30: 1293–1296) suggests a set of circumstances that must certainly qualify as unusual by anyone’s criteria. But I never imagined my eyes, ears, nose, and mouth (not to mention less public places) might be at risk here in the Midwest. I don’t know what to recommend—it’s not as if we can go about our business with eyes shut tight and fingers in our ears. Maybe I’ll think of something, but, until then, I can pass on one bit of advice—if you should find yourself in a Japanese restaurant, try to steer clear of the pickles when you sit down.

May Berenbaum is a professor and head of the Department of Entomology, Morrill Hall, 505 S. Goodwin Avenue, University of Illinois, Urbana, IL 61801. Currently, she is studying the chemical aspects of interaction between herbivorous insects and their hosts.