Frass-Eating Grins

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One Sunday morning, as I was listening to the radio while driving to some otherwise forgettable destination, I was taken aback to hear a conversation on the air about frass. When I say "frass," I don't mean that this was my editorial opinion of a commentary that I didn't agree with—this was actually a discussion about the meaning of the entomological term "frass." As I listened, I discovered that the program was called "Says You" (http://www.wgbh.org/radio/saysyou/?from=dictionary.com)—a radio quiz show based loosely on a game that, when I played it in high school, was called "Fictionary." Basically, the game consists of participants choosing an obscure word from the dictionary and then trying to stump a player who hadn't seen the definition by inventing plausible alternative definitions; the challenge to the player is to choose the correct dictionary definition.

I was pretty good at this game in high school, and hours of playing it is how such colorful words as "furbelow" ("a piece of material pleated or puckered, on a gown or petticoat; a flounce or ruffle") and "eryngo" ("candied sea holly root, formerly used as an aphrodisiac") came to enter my vocabulary. (Just a note in passing—this is the first time, since playing the game in 1971, that I've actually managed to incorporate the word "furbelow" into anything I've written.)

At least that's how I think the radio show worked, given that I was trying to watch traffic lights and oncoming cars while listening intently to contestants trying to make up meanings for the word "frass." The actual dictionary definition was rendered loosely to the contestant as "termite doo." Evidently, the contestant couldn't believe that a term existed to describe the excrement of termites and instead chose a phony definition along the lines of "casting professional aspersions on a colleague" as the correct one (thereby losing the game).

I don't know why the contestant had trouble imagining that there is a technical term for insect excrement. There's certainly no shortage of it in the world. Excrement plays an incredibly important role in the life of many, if not most, insects. First and foremost, it's a source of food for many small arthropods. For example, what's euphemistically called "flea dirt" is actually the excrement of adult fleas, which serves as the primary source of nutrition for larval fleas (a fact that might enlighten your own children if they ever complain about what you're serving for dinner).

As well, it's used as a medium for communication, dispensing all kinds of pheromonal messages intraspecifically (e.g., aggregation, Sakuma and Fukami 1993; or oviposition deterrence, Anbutsu and Togashi K. 2002) and even interspecifically (as a cue for finding prey) (Rutledge 1996). Anal trophallaxis, the exchange of alimentary fluids via posterior orifices, is fundamental to the social fabric of termites in general (Suarez and Thorne 2000), giving "termite doo" tremendous significance in global nutrient recycling.

In many otherwise docile and defenseless herbivorous insects, excrement is the best weapon against enemies; they can hide under it (Eisner and Eisner 2000) or even fling it if the situation warrants it—the skipper caterpillar *Calpodes ethlius* (Stoll) can hurl its excrements at speeds exceeding 1.3 m/s (Caveny et al. 1988)—an accomplishment that fabled feces-flinging great apes might envy. Even resembling insect excrement can be a good defense against enemies. Although chlamysine chrysomelids in the genera *Neochlamisius* and *Exema* construct cases out of their own excrement as larvae, they emerge as excrement-unadorned adults with an eerie resemblance to caterpillar droppings—enough, one imagines, to dissuade

even a very hungry bird from attempting to attack.

Before the subject of frass was forced into my mind that Sunday, I certainly knew of many technical terms for insect excrement, depending on its age (e.g., fossilized excrement becomes a "coprolite"), or chemical composition (e.g., carbohydrate-rich excrement from aphids is called "honeydew"), or shape (the frass that accumulates on the anal forks of cassidine chrysomelid beetles is occasionally referred to rather heroically as a "fecal shield") (Olmstead and Denno 1993). But this radio program episode did prompt me to investigate the etymology and precise meaning of a word that I confess I've used rather loosely over the years. A Google search of the Internet yielded over 20,000 hits; a perfunctory perusal of the entomologically relevant sites seemed to divide equally in referring to any form of insect excrement as frass or exclusively to plant debris, occasionally mixed with excrement, generated by plant-boring insects.

This duality inspired me to consult more definitive sources—namely, dictionaries—for a precise definition. My desktop dictionary, the 2,347-page Webster's Deluxe Unabridged (2nd edition), was of no help—"frass" simply cannot be found between "*Frasera*" and "frat." The substantially larger Oxford English Dictionary was of course more enlightening. The OED defines frass as "The excrement of larvae; also, the refuse left behind by boring insects" (which was more or less the definition used by the folks at "Says You," more poetically rendered as "termite doo"). Etymologically, the word is derived from the German *frasz*, from the root of *fressen* (= *fret*, to devour). The oldest example of the use of the word dates back to 1854 and appears to have been coined by lepidopterist H.F. Stainton,who wrote,

> The half-eaten leaves attest but too surely that some devourer is near. These indications of the presence of a larva are expressed in the German language by the single word '*frass*," and we may, without impropriety, use the same word for the purpose of expressing the immediate effect of the larva's jaws, and the more indirect effect of the excrementitious matter ejected by the larva (Entomol. Comp. edition 2).

Thus, Stainton (better known for naming species of Lepidoptera rather than their leavings) seems to have been the first to borrow from the German to introduce a word into the scientific lexicon that would maintain propriety and at the same time spare generations of entomologists from having to learn how to spell "excrementitious."

The new word didn't catch on all that quickly; the next example of usage provided by the OED followed Stainton's by six years. In 1860, E. Adams, in Trans. Phil. Soc. 91, described frass as "the rejectamenta found at the entrance of the burrows of wood-boring insects." Interestingly, although "frass" has endured, a Google search of "rejectamenta" yielded only 212 hits, none of which, as far as I can tell, refer specifically to insect excrement. (The word does appear on the 2003 Scripps Howard National Spelling Bee Consolidated Word List (http://www.spellingbee.com/) so, unlike "excrementitious," at least some people still have a need to know how to spell it.)

My web search for "frass" turned up more than a few surprises; among the biggest was finding an actual recipe for frass. This appeared at http://www-2.cs.cmu.edu/People/mjw/recipes/ethnic/german/hessian-coll.html, a page of German recipes from Hessen, Germany, found by webmaster Micaela Pantke "on some sheets that were used as separators when a copy shop returned my printing order for a science fiction fanzine I'm publishing." The ingredients for frass consist of 1–1.5 kg white cabbage, 2–3 French rolls, 1/4 liter milk, 250 g minced meat, 2–3 large onions, and "a little amount of bacon." Basically, the ingredients are chopped, combined, soaked, and baked in a soufflé dish for about an hour. The name of the recipe was accompanied by a note stating that "this German expression is a rather rude one."

Intrigued by both the recipe (which as a vegetarian, I'd mercifully never have to eat) as well as the caveat about the name, I consulted Martin Hauser, a graduate student in our department who, with infinite patience and tolerance, serves as my authoritative source of information on all things simultaneously German and entomological.

In response to my query as to whether he'd eaten anything called "frass," Martin replied, "Frass comes from 'fressen' but only animals do that. Humans 'essen' and animals 'fresen'. So if you see somebody in a restaurant eating very fast, using his hands, eating without any style and grace and not chewing his food you could say that what he is doing is 'fressen' (typical for fast food places). And also if you go to a place and the food looks bad (e.g., in prison, where you get a dish full of amorphous mash) and it looks more like something you would give to pigs, you call it 'frass'. So frass means 'feed for animals' or 'swill'. Also, when caterpillars and other bugs eat plants, you say that you can see 'frass' on the plants. This is a more scientific term and not rude at all. But you will never see 'frass' on the menu except if you have a funny chef, and he wants to make a joke. So I have never ordered 'frass', but I have received it several times."

So, basically, what I found on the Internet was a recipe not for insect excrement, but rather for metaphorical swill, from a chef who thought he was being funny. I guess that means it wouldn't make much sense to prepare frass for an entomology potluck. That same web page on Hessian cooking, though, also had a recipe for another, more promising dish, called "Lumpen und Fleeh," translated by the sci-fi fanzine editor as "Rags and Fleas." With the exception of the bacon and the milk, and with the addition of cumin seeds, the recipe looks a lot like that for frass. I'll have to ask Martin if he has ever eaten Rags and Fleas. Or maybe not—one of these days, I expect he's going to stop answering my e-mails (and the odds that he'd actually come over to my house for a home-cooked Hessian meal aren't getting any better, either).

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