Methane, flatulence, and the coevolution of bacteria

Contributed by Boldone
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The book A Field Guide to Bacteria by Betsey Dexter Dyer features a mine of gold for evolutionary thinking. Easily readable, it does not require the chemical and biological background needed to approach many other textbook on prokaryotic life. Just what many ecologists and evolutionary (paleo)biologists need, in order to figure out the complexities of metabolical ways involved in energy transfer and ecosystem functioning. The qualities of this guide, a must for a nicely-stuffed bookshelf on Natural History, stem from the focus on ‘field marks’ that the author has decided to impart to her observations, and the choice to skip most aspects demanding the use of a microscope or knowledge related to this. Whatever your point of view on natural history, you can be sure there’s some type of bacteria involved in some kind of way in your work, probably many types zusammen, the afterthoughts being germane to some aspect of evolution. One example has to do with human flatulence, cited here with some indulgence, but mainly to stress how far the evolutionary mind can go when observing natural phenomena.

On page 59 we read: “The intestines of humans are loaded with bacteria. The colon in particular is estimated to have more than 100 species of bacteria, mostly Bacteroides and gram-positives. These fermentative bacteria are exactly the sorts of compatriots with which methanogenic archea thrive. However, not all human colons contain methanogens. [...] The presence of methanogens seems to be in part a familiar trait. It can be quite difficult to sort out if a trait such as this is genetic or environmental. Twins both identical and fraternal have similar methanogens. Children of methane-emitting parents do too. It appears that one spouse can “give” methanogens to another. But is this due to similar diets, or to a passing around of actual bacteria and a genetic tendency to harbor them? A genetic influence is suggested by the fact that most Old World primates are methane emitters, whereas most New World primates are not, regardless of similarities of diet”. And to finish with the reason for the title: “If intestinal gas smell sulfurous it is not likely to be rich in methane. Direct evidence for methane in flatulence is its flammability [...] A fraternity trick—not recommended here—is to attempt to light one’s flatulence, with a little jet of blue flame indicating the presence of methane”.

The world as we perceive is shaped a great lot by bacteria. Life starts with prokaryotes, and ends with them, as a matter of fact, and we can’t do nothing against their overwhelming power and omnipresence, an evidence finely told by Stephen Jay Gould in Full House. But what have we done to them in our turn? How much is their evolution shaped by that of us pluricellular eukariotes? What the impact on prokaryotes of the evolutionary innovations introduced by the Cambrian radiation of metazoans? And what about the Paleozoic colonization of terrestrial habitats? Anything happened after the Cretaceous radiation of angiosperms? The knowledge contained in the field guide by Dyer is helping us to realize that many prokaryotic species may particularly thank us primates for their existence, and that new species appearing and old ones extinguishing may be much dependent on us humans, what we eat, where we choose to migrate, what technologies we invent.