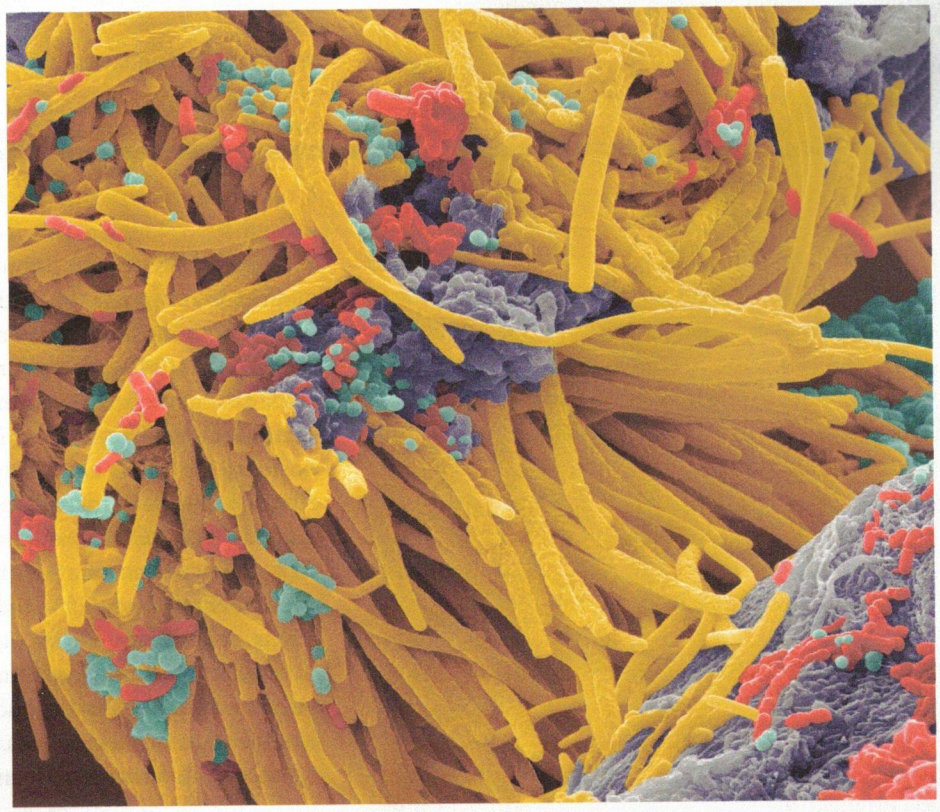
IN THEIR OWN WORDS

Have We Ever Been Individuals?

Evolutionary biologists committed to the Modern Evolutionary Synthesis, interested in carrying out microevolutionary studies of natural selection on genes, have worked hard to clarify distinctions between species, populations of a particular species, and organisms that belong to such populations. Now, the seemingly self-evident, taken-for-granted boundary distinguishing one individual organism from another is not looking so self-evident after all—even among mammalian species, such as ourselves. Recent research is showing that it is incorrect to assume that each biological individual (such as an individual human organism) is also a genetic individual; that is, in possession of just a single genome. On the contrary, each human organism contains within it multiple communities of different species of microbes, each with its own separate genomes, living with us in a mutually beneficial association called symbiosis. Biologists Lynn Chiu and Scott Gilbert explain that 90% of the cells in mammalian bodies belong to populations of different species of microbes that affect a range of chemical processes supporting our ongoing health and well-being. Some of these microbes contribute to our digestive processes; others to the construction of our bodies; others to our brain function; still others keep our immune system operating properly. And these symbiotic relationships are ancient. As Chiu and Gilbert put it, "Development is a multi-species project. The mammalian body requires its symbionts; it is not constructed properly if it does not have them" (2015, 193).

For these reasons, biologists suggest that the proper term to identify organisms such as ourselves is not "individual" but rather "holobiont," a label that acknowledges the fact that each of us contains within ourselves multiple communities of symbionts of different species. Thinking of organisms as holobionts reshapes the way we think about not only our relation to other organisms but also the way we understand our own life cycles. In particular, Chiu and Gilbert argue that thinking of humans as holobionts reshapes our understanding of what happens when we reproduce. We can no longer consider human reproduction to involve only a male individual and a female individual, whose individual genetic endowments are joined to produce an individual offspring. Rather, we



This scanning electron micrograph shows some of the bacteria living in your mouth. Humans and other animals have symbiotic relationships with microbes that are integral to various biological functions such as digestion.

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