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A VISIT TO AMSTERDAM'S MICROBE MUSEUM

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SHARE TWEET



Micropia is a shrine to the super-small, a haven for charismatic minifauna.

PHOTOGRAPH COURTESY ED YONG

On a warm summer afternoon in Amsterdam, a line of visitors snaked toward the entrance of the Artis Royal Zoo, queuing to see the typical assortment of elephants, giraffes, penguins, lions, and so on. I, however, was more interested in the building opposite the ticket booths, which had a very different menagerie inside. A large banner draped over the building's two stories displayed a collection of fuzzy colored balls, shaped like a waving person. This towering gestalt figure represented the human microbiome—the trillions of bacteria and other microorganisms that inhabit our bodies. With its purposeful stride and genial wave, it welcomed passersby into Micropia, the world's first museum devoted entirely to microbes.

Micropia launched in September, 2014, after twelve years of development and ten million euros of investment. None of the creatures in its exhibits is bigger than an ant, and most are substantially smaller—zipping water fleas, invincible tardigrades, green algae, and innumerable bacteria. The place is a shrine to the super-small, a haven for charismatic minifauna, a place where the cages and paddocks of the neighboring zoo have been swapped for agar plates and glass slides. The fact that it exists at all is a tribute to the growing realization that the great majority of microbes are neither signs of filth nor bringers of disease but vital parts of the world around and within us.

It is fitting that such an attraction should open in the Netherlands, the birthplace of microbiology. It was here—or, more precisely, forty miles away from Amsterdam, in the bustling trade hub of Delft—that a draper named Antoni van Leeuwenhoek became the first person in history to see bacteria. Leeuwenhoek had no scientific training, but he excelled at making microscopes. He would grind his own impossibly tiny lenses and sandwich them between brass plates, creating devices that looked like glorified door hinges and acted as exceptionally powerful magnifying glasses. With these glasses, he peered at everything from animal hairs to plant parts. But his real revelations came when he trained his lenses on samples of water that he had collected from a nearby lake, from a pot outside his house, from the canals of Delft, and elsewhere. Again and again, he saw life in untold numbers: miniscule creatures, dancing and dashing about. He called them animalcules; we know them today as protists and bacteria.

A replica of one of Leeuwenhoek's superlative microscopes is the first thing on display past Micropia's ticket barriers. It sits in a glass jar, humble, incongruously simple—and mounted upside down. Around it are samples of the things that Leeuwenhoek examined, including infusions of pepper, duckweed from a local pond, and dental plaque. These exhibits are more than curios. They are a testament to Leeuwenhoek's untrammelled curiosity, to the sort of mind that would lavish such attention on such mundanity. As Nick Lane, a biochemist from University College London, once wrote, "More than being the first to see this unimagined world of animalcules, he was the first even to think of looking."

Departing the Leeuwenhoek collection, I stepped into a lift with a friend and a family of visitors. We looked up to see ourselves reflected in a video feed on the ceiling. As the lift rose, the video zoomed in on our faces, closer and closer, smoothly transitioning from actual video to animations of eyelash mites and skin cells, then bacteria, and eventually viruses. When the doors opened, on the second floor, we saw a series of words written in little pinpricks of light, shimmering gently, like a living colony. “When you look from really close, a new world is revealed to you, more beautiful and spectacular than you would ever have imagined,” it said. “Welcome to Micropia.”

Immediately, there was a firsthand glimpse into that new world, through a row of microscopes trained on mosquito larvae, nematodes, slime molds, algae, and pond bacteria. The last were magnified two hundred times, which is, astonishingly, about the same as what Leeuwenhoek’s self-made microscopes could muster. He might have seen these wonders too, albeit in much less comfort. Whereas he had to squint through a tiny lens, Micropians can push their faces up against a padded eyepiece and look at a crisp digital display.

After the microscopes, I went to stand in front of a seven-foot-tall screen, where I let a camera mounted near the top scan my body. A microbial avatar popped up, with its skin outlined in white dots and its internal organs represented in bright colors. As I waved, it waved; as I shuffled, it shuffled. By moving my hand, I was able to select an organ and reveal information about its resident microbes—about the denizens of my skin, stomach, gut, scalp, mouth, and nose, and about how they affect my behavior, train my immune system, digest my food, and protect me from disease.

Given how readily people tend to associate microbes with all that is vile, the information on offer at Micropia is remarkably unapologetic, and the visitors seemed to become accustomed quickly to the idea that their bodies aren’t entirely their own. No one recoiled or frowned or wrinkled his or her nose. Leeuwenhoek didn’t, either. When he examined his dental plaque, he was positively delighted to learn that his mouth was crawling with life. The popular revulsion came later, after Louis Pasteur and other pioneers confirmed that some microbes were responsible for plagues and pestilence. We started treating them as enemies and developed ever better ways of killing them, from antibiotics to sanitizers.

Micropia returns its visitors to an unpasteurized era, when invisible organisms were objects of fascination rather than targets for elimination. A young couple embraced on a heart-shaped red platform, the Kiss-o-Meter, which told them how many bacteria they had just exchanged. A woman gazed intently at a wall of stool samples from llamas, gibbons, storks, lions, anteaters, elephants, and sloths, all collected from the nearby zoo and double-sealed in airtight jars and Lucite cases. A group of teen-agers stared at a wall of backlit agar plates, some of them with mold or bacteria colonies that traced the contours of the places where they had first begun to grow: keys, phones, computer mice, remote controls, toothbrushes, doorknobs, a euro bill. There were orange dots of *Klebsiella*, blue mats of *Enterococcus*, and gray pencil shadings of *Staphylococcus*—contamination made beautiful.

Meanwhile, the family from the lift were staring at a wall-sized tree of life. Our most honored kingdoms, the animals and the plants, were relegated to a small circle in the corner, with the rest of the tree blooming in microbes—the familiar bacteria, and a superficially similar but fundamentally different group called the archaea. As the family looked over the diagram, it occurred to me that the father might well have been born before anyone even knew that the archaea existed. Although their name derives from the Greek word for “ancient,” they weren’t properly classified until 1977.
