

The Microplastic Fantastic

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What are microplastics?

Step on the earth, dip a toe in the river, and take a breath. Land, water, and air have all been touched by microplastics, the most ubiquitous form of pollution¹ which has been found near the summit of Mt Everest² and the Mariana Trench³. The term “microplastics” was coined in 2004 by marine ecologist Richard Thompson at the University of Plymouth to describe plastic particles smaller than 5 millimetres across⁴. Microplastics come from larger plastic pieces that disintegrated, resin pellets in plastic manufacturing, or microbeads from health and beauty products⁵. They may be so small we cannot see these polymers, though we touch and even inhale them.

¹ Conocimiento, Ventana al. 2020. “Microplastics, the Most Ubiquitous Pollution of Land and Sea.” *OpenMind* (blog). July 27, 2020. <https://www.bbvaopenmind.com/en/science/environment/microplastics-the-most-ubiquitous-pollution-of-land-and-sea/>.

² Napper, Imogen E., Bede F. R. Davies, Heather Clifford, Sandra Elvin, Heather J. Koldewey, Paul A. Mayewski, Kimberley R. Miner, et al. 2020. “Reaching New Heights in Plastic Pollution—Preliminary Findings of Microplastics on Mount Everest.” *One Earth* 3 (5): 621–30. <https://doi.org/10.1016/j.oneear.2020.10.020>.

³ Peng, X., M. Chen, S. Chen, S. Dasgupta, H. Xu, K. Ta, M. Du, J. LI, and Z. Guo. n.d. “Microplastics Contaminate the Deepest Part of the World’s Ocean | Geochemical Perspectives Letters.” Accessed October 23, 2023. <https://www.geochemicalperspectivesletters.org/article1829/>.

⁴ Lim, XiaoZhi. 2021. “Microplastics Are Everywhere — but Are They Harmful?” *Nature* 593 (7857): 22–25. <https://doi.org/10.1038/d41586-021-01143-3>.

⁵ US Department of Commerce, National Oceanic and Atmospheric Administration. 2023. “What Are Microplastics?” January 26, 2023. <https://oceanservice.noaa.gov/facts/microplastics.html>.

Microplastics as companions

The ubiquity of microplastics makes them our involuntary companions, similar to Donna Haraway's concept of companionship where she proposed that human and canine beings are entangled in a web of relationships that blurs the boundaries between species⁶. In my PhD research, I expand on Haraway's "companion species" by using the term "companion molecules" to recognize the agency of the molecular⁷. In this exhibition, we are companions with the polymers of microplastics, where we have a reciprocal transformative relationship with them where each produces the other. In other words, we produce microplastics, while microplastics shape us. Microplastics share the anonymity of Mr. Anading's portrait photographs and also Dr. Manomaivibool's research—we do not know to whom the pieces of artificial turf, coated fertiliser, styrofoam, tarpaulin, and rope belong to, but we might imagine what activities these were related to—perhaps packaging, fishing, agriculture, and so on.

Microplastics and petroleum

Our deep relationship with microplastics gives us an orientation with what Cara Daggett calls "petro-masculinity", a fossil fuel-powered concept of identity⁸, as microplastics are petroleum-derived. The majority of plastic, whose molecular building blocks are ethylene and

⁶ Haraway, Donna Jeanne. 2003. *The Companion Species Manifesto: Dogs, People, and Significant Otherness*. Chicago, Ill.: Prickly Paradigm.

⁷ Young, Catherine Sarah. "The Ghost of Rain: Investigating Petrichor as Companion Molecules in the Critical Zones through the Arts." University of New South Wales, School of Art and Design. In progress. Expected completion 2024.

⁸ Daggett, Cara. 2018. "Petro-Masculinity: Fossil Fuels and Authoritarian Desire." *Millennium* 47 (1): 25–44. <https://doi.org/10.1177/0305829818775817>.

propylene, are derived from the further transformation of petroleum by-products⁹. Like petroleum, we use plastic in most aspects of our lives, which Susan Freinkel narrates in *Plastic: A Toxic Love Story* using common objects, such as the comb, the chair, the Frisbee, the IV bag, the disposable lighter, the grocery bag, the soda bottle, and the credit card to illustrate plastic's ubiquity¹⁰. As only 9% of plastic is recycled¹¹, we can surmise that these plastic polymers eventually break down into microplastic pollution. Recognizing that we orient ourselves repeatedly with microplastics—that these polymers become our companions from the medical equipment used to help our mothers deliver us to our daily activities and up to our deaths—may awaken us to our shared responsibility to caring for the environment, which is equal to caring for our own health.

Harms of plastic

In 2022, microplastics were found in human blood for the first time¹², connecting the planetary Earth body with the human body. While there is no definitive evidence of what happens to the human body when exposed to plastic¹³, it has been found that microplastics can

⁹ Geyer, Roland, Jenna R. Jambeck, and Kara Lavender Law. 2017. "Production, Use, and Fate of All Plastics Ever Made." *Science Advances* 3 (7): e1700782. <https://doi.org/10.1126/sciadv.1700782>.

¹⁰ Freinkel, Susan. 2011. *Plastic: A Toxic Love Story*. Melbourne: Text.

¹¹ OECD Global Plastics Outlook Database. 2022. "Plastic Pollution Is Growing Relentlessly as Waste Management and Recycling Fall Short, Says OECD." Accessed October 23, 2023. <https://www.oecd.org/environment/plastic-pollution-is-growing-relentlessly-as-waste-management-and-recycling-fall-short.htm>.

¹² Carrington, Damian. 2022. "Microplastics Found in Human Blood for First Time." *The Guardian*, March 24, 2022, sec. Environment. <https://www.theguardian.com/environment/2022/mar/24/microplastics-found-in-human-blood-for-first-time>.

¹³ Lee, Yongjin, Jaelim Cho, Jungwoo Sohn, and Changsoo Kim. 2023. "Health Effects of Microplastic Exposures: Current Issues and Perspectives in South Korea." *Yonsei Medical Journal* 64 (5): 301–8. <https://doi.org/10.3349/ymj.2023.0048>.

damage cells¹⁴. Ingesting microplastics could further expose us to chemicals found in some plastics that are known to be harmful to the endocrine system and the hormones that regulate human growth and development¹⁵. We have seen images and videos of animals, especially marine life, catching themselves in plastic nets or mistaking plastic for food, underscoring the harms of single-use plastic on other living beings. The accumulation of plastics of all sizes also chokes up the waterways in Anading's *every water is an island*. In these videos, the smaller plastic particles may also be filmed without the artist seeing them from his vantage point. In the future, one might imagine that instead of sunlight hitting the water, the rays might hit moving patches of plastic waste, the invisible particles coalescing into visible islands.

Microplastics in the body

The production of microplastics is human-made and is situated in the Anthropocene, a term coined by Paul Crutzen and Eugene Stoermer to describe the most recent period in Earth's history when human activity started to have a significant impact on the planet's climate and ecosystems¹⁶. In 2021, the petrochemical industry generated 139 million metric tons of single-use plastic waste—6 million metric tons more than in 2019 as reported by the Plastic Waste Makers Index by the Minderoo Foundation¹⁷. These large plastic objects will be broken down

¹⁴ Danopoulos, Evangelos, Maureen Twiddy, Robert West, and Jeanette M. Rotchell. 2022. "A Rapid Review and Meta-Regression Analyses of the Toxicological Impacts of Microplastic Exposure in Human Cells." *Journal of Hazardous Materials* 427 (April): 127861. <https://doi.org/10.1016/j.jhazmat.2021.127861>.

¹⁵ Gerretsen, Isabelle. 2023. "How Microplastics Are Infiltrating the Food You Eat." January 4, 2023. <https://www.bbc.com/future/article/20230103-how-plastic-is-getting-into-our-food>.

¹⁶ Crutzen, Paul J., and Eugene F. Stoermer. 2000. "The 'Anthropocene.'" *The International Geosphere–Biosphere Programme: Global Change Newsletter* 41: 17–18.

¹⁷ "Plastic Waste Makers Index - Minderoo Foundation." n.d. Accessed October 22, 2023. <https://www.minderoo.org/plastic-waste-makers-index>.

into smaller pieces through time, and eventually, microplastic particles that submerge, float, transfer, embed, and fuse into ecosystems and bodies. In Mr. Anading's photograph, *Broken SD Card*, the accidental breakage results in the loss of the memories the card contains and also catalyzes the further decomposition of the object into smaller and smaller pieces, eventually shaved into the microplastic accumulation of the planet. One day, one of us might inhale the anonymous particles of this SD card. Eventually, we may find ourselves accumulating dangerous levels of microplastics, whose full agency in terms of acting on our health we are yet to discover. How much microplastic are you?