

# RARE EARTHENWARE

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## *Unknown Fields*

Rare earth metals are the fundamental materials that enable the featherweight, slim, and seamless aesthetics of our contemporary technologies. As our personal electronics tend toward the invisible, they conjure in their shadows an undeniably visible gray mountain, a one-kilometer deep pit, and a ten-kilometer radioactive tailings lake, a counterweight to the apparent immateriality of computing, communications, and electric energy.

Unknown Fields has used the toxic mud from this radioactive tailings lake in Baotou, Inner Mongolia, to craft a set of three ceramic vessels.

Each vase is sized in relation to the amount of waste created in the production of three items of technology—a smartphone, a featherweight laptop, and the cell of a smart-car battery. With a slightly shimmering burnish from the reaction of the mineral content during firing, the vessels are the material shadow of a valuable technological object.

The toxic waste dug from the ten-square-kilometer tailings lake was discharged from the surrounding factories and contains a cocktail of acids, heavy metals, carcinogens, and radioactive material, including thorium and uranium, used to process the seventeen most sought after minerals in the world, which are known as rare earths.

China produces over 95 percent of the world's rare earths, and two-thirds of this production is in Baotou, a pastureland turned wasteland on the edge of the Gobi Desert.

At the nearby Bayan Obo mine, unpronounceable treasures—erbium, yttrium, dysprosium, europium, neodymium—are drawn from the 56-million-ton Treasure Mountain deposit, the largest in the world.



**Figure 1** Unknown Fields at work in the London Sculpture Workshop. The mud taken from a radioactive tailings lake in Inner Mongolia contains a cocktail of acids, heavy metals, carcinogens, and radioactive material.



**Figure 2** The finished vases are sized in relation to the amount of waste created in the production of three items of technology that use rare earth: a smartphone, a featherweight laptop, and the cell of a smart-car battery.



**Figure 3** Baotou, China, 2014: a rare-earth refinery with centrifuges concentrates rare-earth ore into industrial application before it is force dried into powder form. China produces 76 percent of the world's rare-earth magnets.



**Figure 4** Baotou, China, 2014: film still from *Rare Earthware* (2014) showing Unknown Fields collecting radioactive mud from the tailings lake at the outflow of Baogang Iron and Steel Corporation. The mud was used to craft the set of three ceramic vessels.

In silhouette, they echo highly valuable Ming dynasty porcelain Tongping or “sleeve” vases. Vases are traditionally objects of value that hold objects of value and display wealth, vessels for meaning and for transporting goods. Ming vases are particularly iconic objects of high value, as well as being artifacts of international trade. The Ming dynasty was, for a time, a one family global superpower, built on the trade of commodities such as imperial porcelain and presiding over an international network of connections, trade, and diplomacy that stretched across Asia to Africa, the Middle East, and Europe.

These three “rare earthenware” vessels are the physical embodiment of a contemporary global supply network that displaces earth and weaves matter across the planet. They are presented as objects of desire, but their elevated radiation levels and toxicity make them objects we would not want to possess. They represent the undesirable consequences of our material desires.

An accompanying photo essay developed in collaboration with photographer Toby Smith charts the unmaking of these objects of technology, reversing their journeys from container ships and ports, through wholesalers and factory floors, all the way back to the banks of the barely liquid radioactive lake in Inner Mongolia that is continually pumped with tailings from the rare-earth refining process. The unmaking of our technologies is the making of these vases, carefully crafted from their toxic by-products.

Credits: Unknown Fields in partnership with the Architectural Association. Commissioned by the Victoria and Albert Museum. Film and photography in collaboration with Toby Smith. Ceramics work in collaboration with the London Sculpture Workshop. Animation assistance from Christina Varvia. Photography: Toby Smith/Unknown Fields

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*Unknown Fields* is a nomadic design research studio directed by Kate Davies and Liam Young. The studio members venture out on expeditions to the ends of the earth to bear witness to alternative worlds, alien landscapes, industrial ecologies, and precarious wilderness. These distant landscapes—the iconic and the ignored, the excavated, the irradiated, and the pristine—are embedded in global systems that connect them in surprising and complicated ways to our everyday lives. In such a landscape of interwoven narratives, the studio uses film and animation to chronicle this network of hidden stories and reimagine the complex and contradictory realities of the present as a site of strange and extraordinary futures.