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> EDITORIAL

Mineral transformation and resource extraction generate some of the most complex environmental, social and economic problems facing humankind and the planet today.

In one way or another, resource extraction and mineral transformation are central to human existence. Like all biological organisms, we are mineral and matter transformers, on very small and very large scales. Mammals breathe oxygen and emit carbon dioxide, and build mass through minerals ingested in food; as Russian scientist Vladimir Vernadsky noted, we are walking, talking minerals. Plants build mass by extracting carbon dioxide from the atmosphere, which releases oxygen. The carbon, nitrogen and water cycles surround and condition these processes, forming the principles which govern all life on earth.

Humans are increasingly recognised as powerful actors in these cycles, with some humans more implicated than others. Fossil fuel extraction for energy and manufacturing releases carbon dioxide and methane, heating up the planet. The use of nitrogen fertilizers has dramatically increased the amount of nitrous oxide, a potent greenhouse gas, in the atmosphere. Our built environment is grounded in resource extraction; silica for glass, sand for concrete, iron ore for steel. The shifting, expanding or degrading lives of extracted materials may also affect us in ways we do not immediately recognise.

Extractive processes and industries are celebrated as engines of some national economies and have a host of negative consequences; environmental degradation, groundwater contamination, market speculation and manipulation, conflict with Indigenous peoples and farming communities over social and territorial impacts – to name but a few. Given the triumphalism of what humanity has achieved with resources and the litany of problems associated with their extraction, the subject generates profound ambivalence. And alongside the practicalities of transitioning to renewable and sustainable forms of energy and resource use, questions arise about what it takes for governments and corporations to support and encourage such a transition.

This issue of *Transformations* explores how scholars in creative arts, the humanities, and social sciences are contributing to the debates and politics of resource transformation and

extraction. The complex socio-cultural and environmental legacies of nitrate, lithium, coal and uranium mining are examined across a range of sites in Europe, South America, Asia, and Australia. Across these different sites and modes of engagement, what emerges is a very tangible sense of the forces exerted by the activities of resource extraction upon environments and human populations.

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