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Semiotic Thresholds, Between Arts and Biological Science: Green Technology and the Concept of Phytomining

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Abstract: *This paper documents the creative process of the Between Arts and Biological Science: Green Technology and the Concept of Phytomining project. The project represents an iterative series of concepts, models, and installations about the Anthropocene which culminates in design ideas for the creation of a functional environmental remediation system. The paper is given in three parts: historical conception, small scale modelling and the creation of a working phytoremediation system. Phytoremediation systems use plants to extract, sequester, and/or detoxify pollutants; common examples include heavy metals and human waste. Such solutions tend to be mechanically simple but biologically complex. The rationale behind the creation of this system was to create an autonomous remediation process that could function without external input, such as one that would be needed if economic or environmental resources are scarce, as is common in times of political, economic or environmental crises. This project is an exploration of how biological and technological systems can be integrated using plants and algae as a test medium - primarily *Taraxacum officinale* and *Chetomorpha* algae. The work uses several theoretical post-hoc constructions to explore the nature of design in remediation systems, these being: the Anthropocene, and phytosemiotics. This paper works at the art-engineering interface as it illustrates the process of going from conceptual models to full-scale construction of a working system. The paper does not seek to draw definitive conclusions but promote debate. We believe our primary contribution in this area is to give working examples of how biotic and abiotic sign systems can be integrated and designed to create products that are beneficial to humankind. Humankind in the age of the Anthropocene¹.*