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## TOXIC AND WASTED: ARTISTS THINKING ABOUT HOW TO ENGAGE WITH MATERIAL FUTURES

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The artist Michael Heizer is quoted as saying “the history of sculpture ... consists mostly of remains and fragments, damaged either by men or by natural phenomena” (Kastner 2009, 40). Productively blurring the line between art and waste, this assertion points us toward considering the essential unity of things that humans make that outlast their makers. Every material humans enlist, whether aesthetically pleasing or seen as exhausted, understood as neutral, or feared to be destructively active, has the potential to end up discarded. And everything can return from discard to raw material for new purposes.

These points can be exemplified even by what are viewed as some of the most toxic of contemporary discards, radioactive wastes. Some day, even these may circle back as useful. As Cornelius Holtorf and Anders Högberg (2014:5) wrote, “new technologies, such as transmutation, may allow using nuclear waste to generate further energy or for other purposes, so that this waste becomes a precious resource”. Artists have a long history of undertaking the aesthetic conversion of materials viewed as waste or toxic. Holtorf and Högberg mention the case of James Acord (2009), who fought to obtain a radioactive handling license to use radioactive uranium in his sculptures.

Gabrielle Decamous (2011) has traced artists’ responses to nuclear technology from the very beginning of the nuclear age, identifying works produced as early as 1946. These extended from the use of radioactive materials to works designed to give a sense of otherwise invisible nuclear facilities. Decamous (2011) draws particular attention to the ways art has been used to represent the invisible, showing radioactivity as an active force. She cites the work of Piotr Kowalski, a Polish artist resident in France, who in 1968 “used luminescent radioactive gas encapsulated in nine transparent marbles for *9 ans* (9 Years)” (Decamous 2011, 129). In a related experiment, artist Andy Weir produced sound files made in deep nuclear waste

repositories (Allen 2012). These artists give contemporary people a sense of buried but still present, invisible but still active, radioactive materials.

Other artists, like Acord, demonstrate the way that these notionally, sometimes actually, toxic materials have already penetrated everyday life. In a provocative work, Jonathon Keats created a musical instrument that would sound when objects he bought on eBay emitted gamma rays (Strickland 2018). The same kind of objects activated a work called “Universes Unlimited” that Keats installed in 2008 in a San Francisco gallery. When a radiation source was detected, a visible spark was set off (Keim 2008).

The raw materials Keats used came from the same sources used by Acord: kitchenware made using radioactive materials to produce distinctive colors. Keats described his acquisitions, demonstrating the way that toxicity cannot be separated from everyday life:

I went onto eBay, and bought some uranium-doped glass. Uranium was used as a colorant in classic red glass Fiesta Ware in the 1950s, and in light green glass made in the 1920s and 1930s. That provide[d] my uranium. Then I found a guy who sells scintillating crystals, which are used by Homeland Security as a simple way to detect whether someone has a nuclear bomb under their coat. When a gamma ray hits the crystal, a photon is produced, so it glows a beautiful blue.

(Keim 2008)

Fiesta Ware is a staple of 20th-century interior design that is simultaneously a carrier of toxicity (Sheets and Thompson 1995; Sheets and Turpen 1998). Other ceramics made with non-radioactive elements, including lead, cadmium, and cobalt, that provide colorants or stabilize glazes can also be toxic (Sheets 1998). None of these ceramics are considered appropriate for use in meals today. Yet they are still prized as collectibles, so are not trash either; they are domestic heritage. In work by Acord and Keats, Fiesta Ware dishes moved from collectible heritage property to art.

These artists directly engaged with efforts by the US government to grapple with the much larger legacies of nuclear industries left by weapons development and power plants. Commenting on the work of Acord, Decamous (2011, 129) underlines both his direct engagement with the Hanford site in Washington, a now-decommissioned site of production of plutonium for nuclear weapons and his motivation to create a work that would be a warning “of the risk of contamination 10,000 years from now, when even language will have changed totally and image would be the sole means of communication”.

Keats linked his project “Universes Unlimited” to specific proposals under consideration by the US government to warn future human beings against intruding on buried nuclear waste sites. Writing to the US Department of Energy, he proposed installing the same kind of interactive device he demonstrated in the San Francisco gallery at the site of Yucca Mountain, at the time the US

government's proposed high-level nuclear waste repository, writing "with this, you'd see Yucca Mountain at work, making new possibilities for us":

It would be quite beautiful: the idea is to sink two-mile-deep scintillating crystal stacks into the mountain, sticking out like chimneys, looking like a factory. But instead of sending out smoke, they'd glow in the night. I don't know if the government would go for it, but it'd be less expensive than other things that they've done in the past.

(Keim 2008)

In the pages that follow, I want to pursue some of the connections between waste and art that engagements like this reveal, considering what they can tell us about thinking about toxicity as an expected byproduct of human activities. I begin by outlining proposals for marking nuclear waste repositories developed in parallel, one by experts advising the US Department of Energy, others by artists, participants in a long tradition of artists' efforts to reclaim or commemorate landscapes affected by industrial development.

### **Planning for Nuclear Waste Repositories: Intended and Unintended Monuments**

In 2002, the Desert Space Foundation sponsored a competition inviting artists to design alternative ways to mark the proposed repository at Yucca Mountain, Nevada, intended to house waste from civilian nuclear power generation (Auer 2002). The competition was inspired by the existence of a mandate for the US Department of Energy (DOE) to design a "marker system", required for the only already-approved nuclear waste repository in the US, the Waste Isolation Pilot Plant (WIPP) in New Mexico (Trauth, Hora, and Guzowski 1993).

In the planning process for WIPP, distinctions between markers and monuments, between functional signs and works of art that might become cultural heritage, were erased (Joyce 2020). Two approaches were taken by different teams of experts advising the DOE. In one, archaeological sites recognized today as cultural heritage monuments were cited as prototypes for a surface marker system that would be a modern analog to Stonehenge. A second team proposed instead that universal human responses could be elicited by building large-scale assemblages of stone, earth, and other materials forming spikes, blocks, and other abstract forms. Advocated by an environmental design scholar, this plan forcefully invokes the aesthetics of contemporary non-representational sculpture but justifies it with appeals to supposed universal responses to ancient monuments.

The second proposal put monuments and waste into relation with a third term: art. It invited the kind of responses seen in the Desert Space Foundation competition and other projects in which artists respond to the challenge of revealing the invisible presence of material potentially deadly for more than 10,000 years.

In these projects, artists propose productive approaches to sites considered to be damaged by human activity through the development of modern industry and urbanism.

Both the experts advising DOE and many artists adopted a landscape scale for their proposals. In this, the experts and artists shared a view of the post-industrial landscape as an empty canvas. They echo perspectives that emerged in the 1970s as a movement called Land Art. The experts advising the DOE actually included a recommendation that a contemporary artist be commissioned to produce a piece of Land Art as part of a marker system for the WIPP site, demonstrating that for them, their proposed markers were like works of art.

The initial wave of Land artists wrote about what they thought the projects they were creating would become in the future. This writing provides a source for thinking about the intersections of art and waste. These provide a context for the understandings shared by experts involved in the planning effort for nuclear waste markers (Joyce 2020). They cast light as well on the continuing engagements of artists with such sites and materials.

### **Art, Waste, and Heritage: Land Art and Industrial Landscapes**

Land Art and Earth Art are labels applied to works that began to be created in the late 1960s. A 1968 exhibition in New York City featured photographic documentation of some of what are now recognized as the first Land Art projects (Rigaud 2012). Many blurred lines between natural features and forces, as in the use of metal poles as attractors for lightning strikes in Walter de Maria's "Lightning Field", orientation toward the sun in Nancy Holt's "Sun Tunnels", or the construction of sighting lines in an extinct volcano in James Turrell's "Roden Crater" (Hobbs 1982; Matts and Tynan 2012; Nisbet 2013; Saad-Cook 1988).

Many Land Art installations were sited in the US southwest as a kind of untouched canvas. Yet there is more to Land Art than simply using a purportedly empty landscape as a site. Robert Smithson, who became perhaps the iconic practitioner of Land Art, made clear connections between Land Art and the questions raised when we consider how human activity concentrates toxic materials in certain locations. Smithson insists his work is about entropy, universal processes of decay and change (Smithson 1996a, 1996b). Perhaps his best-known work is "Spiral Jetty" in the Great Salt Lake (Cooke et al. 2005). Entropy is built into Spiral Jetty by the activity of the lake itself. Rising and falling, covering and uncovering the spiral, and leaving deposits on its surface, the lake works beyond the artist's original control and intention, exemplifying the unpredictable future that lies ahead once humans have relocated matter in space. It creates a geological concentration of materials with specific properties, crystals of selenite gypsum or hydrous calcium sulfite ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ) that have made Spiral Jetty a point of reference for contemporary mineral collectors (Sikorski 2019).

Smithson began to imagine his large-scale projects in places on the landscape already affected by human industry, proposing works for a Kennecott Copper mining

site in Utah, a Hanna Coal extraction site in Ohio, and a Minerals Engineering site in Colorado (Hobbs 1982; Ryan 2007). Andrew Menard (2014) argues that Smithson saw any imagination of the US west as untouched by human projects as historically unrealistic. It was a romanticization to be countered by engaging with industrial development sites. Writing about a provocative work entitled “Tour of the Monuments of Passaic, New Jersey” in 1967, Smithson characterized contemporary buildings as “ruins in reverse”, saying they were “the opposite of the ‘romantic ruin’ because the buildings don’t *fall* into ruin *after* they are built but they rather *rise* into ruin before they are built” (Smithson 1996c, 72).

A connection with ruination is evident in some of the early work of a second noted Land Art movement participant, Michael Heizer. “Effigy Tumuli”, created in 1985 in Illinois, consists of five earthen mounds in the shape of animals (Doss 2011; McGill 1990). The work is notable for its location, on land reclaimed after coal mining. In this case, Heizer attempts to commemorate the indigenous relationship to the landscape after it was interrupted and distorted by an extractive industry. In this work Heizer, as did Smithson, imagined the reclamation of a waste site, something contaminated brought back into active and positive engagement with living people.

Heizer’s use of the word “tumulus” identifies the effigy mounds that dot the midwest US with tombs, relegating them to the past. This explicit use of an indigenous vocabulary of form associated with the end of tradition forcefully raises questions of the artistic imagination of historical continuity and discontinuity. Indigenous artists respond to the same sites quite differently, in ways that we shall see also characterize Indigenous responses to the wicked problem of curating radioactive waste.

### Reclaiming Landscape: Indigenous Artists

Native American scholars and activists often treat landscape features as having continuing life. In their art practice, these artists shift from treating landscape scale art as a monument to enabling their activity in art as a performance. In a particularly rich project, an indigenous poet, Allison Hedge Coke, wrote a cycle of poems inspired by earthen mounds at a place originally called Blood Run, now part of a South Dakota State Park, Good Earth (Allen 2015; Hedge Coke 2006). Hedge Coke’s poems explore the relations of a serpent-shaped effigy mound recorded there in 1889, destroyed by later extractive land use, to other beings, invoking the voices of the nonhuman participants making up the place. The poems are meant to be performed, to enact the recognition of the place and its history through sound. Indigenous artists LeAnne Howe (Choctaw) and Monique Mojica (Guna/Rappahanock) also produced performative work in relation to indigenous earthen mounds (Allen 2015).

These indigenous artworks reflect an ontology in which nonhumans, effigy mounds, and even features that government experts and some Land Artists treat as inert natural objects, are not dead, but lively. For example, Yucca Mountain, the proposed container for civilian nuclear waste, while not a human construct, is understood by Shoshone and Paiute people who historically have lived in relation

to it as alive, some naming it with terms that can be glossed in English as “Serpent Swimming West” (Endres 2013). The placement of radioactive waste within the depths of Yucca Mountain, selected as a geologically inert feature from the perspective of US agencies, will actually poison a living being, indigenous critics argue (Endres 2012; Zabarte 2002).

### Remaining Connected: From Marking to Living with Waste

One brief suggestion in the proposals for markers for WIPP called for something more in line with the performativity of engagements with heritage places through which indigenous poets and artists maintain their liveliness. This was a call for what the planning team described as “aeolian structures” that would “resonate in the wind” making “dissonant and mournful” sounds, conveying that it was “a place of great foreboding” (Ast et al. 1993, F-136). The invitation to imagine installing such things was taken up by one of the artists who participated in yet another art project reacting to the planning for marking waste repositories, commissioned by the journal *Columbia* (Wong et al. 2011). The eight artists involved each proposed their own ideas for markers for the WIPP site. Among these, Charles Alwakeel designed “razor-sharp ... beaks” that would “create piercing sounds when wind passes through them”.

Here, there is an echo of two kinds of engagements with a place that were systematically de-emphasized both in the approved design schematics for a faux monument for the WIPP site, and in the alternative installations that echo the work of Land artists. Both of these rely on visibility to claim the attention of future humans. The visual was so critical for WIPP that the proposal included a call to cover the surfaces of the stone elements with explicit messages. Some were in the form of serial drawings, like comic strips showing death as the consequence of digging up buried waste, relying on claims that a universal language of forms has been recognized by humans since at least the Palaeolithic. Other visual messages that would be inscribed on the marker elements would be texts, repeated in multiple languages, ultimately considered the most reliable means to convey the warnings required.

In contrast to this emphasis on visibility, indigenous scholars and activists have called for the transmission of stories of buried waste over generations (TallBear 2001; Weatherdon 2017). Kim TallBear (2001, 4) argued that including “stories, songs ... culturally significant place names, and theater” would be more effective in ensuring the survival of memories of buried toxic wastes than monuments alone. Indigenous critics argue that the formation of lasting memory requires attention to, and acknowledgment of, the failures of the present generation to think ahead before creating a burden for future generations. The tenor of such stories might, then, be elegiac.

In that way they converge with one of the scripts one expert team felt the WIPP markers should convey: “This is not a place of honor ... no highly esteemed deed is commemorated here ... nothing valued is here” (Trauth, Hora, and Guzowski 1993, F-49). Other contributors to the planning of markers also called for orality as a tool to preserve knowledge of the repository. In an early contribution to thinking

about commemorating nuclear waste, semiotician Thomas Sebeok actually proposed the deliberate creation of a cult guarded by an “atomic priesthood”, to be passed down within that group as a sacred secret, with only warnings shared with the people at large, memory to be conserved via “folkloristic devices, in particular a combination of an artificially created and nurtured ritual- and- legend” (Sebeok 1984, 24). A distinct expert group employed by the US Department of Energy to assess the probabilities of intrusion in the waste repository in the future chose to embody some of their thinking in narrative form, writing scenarios for imagined futures. Most predicted the breach of the buried site. The sole vision they provided that suggested success imagined a museum built on the site, complete with an invented children’s culture around the character of Nicky Nuke – a Smokey the Bear for nuclear waste circulating in “children’s books, stories, narrative poems, puzzles, animated films, live theatre productions, and other media” (Joyce 2020, 222).

These interventions, from inside and outside the government planning effort, open up the question of how to preserve memories of toxic materials to wider participation, an invitation taken up by artists. In an award-winning response to a competition to imagine a future marker system for WIPP, Germain Canon produced a series of drawings called “The Time Between the Stones – A Ritual” (Canon 2017). His drawings and captions describe future residents systematically disassembling a construction composed of 10,000 stone slabs, one every year, accompanied by story-telling. Canon wrote “Memory is not a passive action, to be understood and trusted it must be passed on rather than discovered ... This marker does not directly warn about the danger underground, but rather about the interruption of the ritual: the message is to pass on the message” (Canon 2017).

### Art and Toxic Memories

Multiple competitions for alternative markers for nuclear waste have inspired artists to engage with these issues. The Desert Space Foundation selected “Blue Yucca Ridge”, a work by Ashok Sukumaran that proposed planting a genetically altered field of yucca plants that would glow blue as a kind of unnatural sign, as the winner of its competition (Auer 2002). Artistic competitions call attention to the way that waste is assigned to spaces out of the sight of the powerful, as in the winning design for a “Plutonium Memorial” to be built near the White House, countering the concealment of projects like these from the powerful by their common location in what the sponsors called “the backyard of the poor” (Rogers 2002). Other designs for this memorial proposed to incorporate human skeletons and bones. This acknowledgment of the potential human cost of waste echoed a comment by one of the experts advising the DOE, who argued that “the most effective ‘marker’ for any intruders will be a relatively limited amount of sickness or death caused by the radioactive waste” (Ast et al. 1993, F-143).

Artists routinely insist that rather than tucking radioactive waste out of sight and out of mind, humanity needs to maintain an ongoing dialogue about and with these

materials. So, as part of the *Columbia* journal response to the WIPP site, an artist named Emcee C. M. proposed a conversation to be carried on for millennia by a “Committee for Radical Inquiry into the Earth’s Regretful Situation” (Wong et al. 2011). Claire Jamieson proposed a 10,000-year-long project of “sequenced ruination” through which a Stonehenge-like monument would gradually be uncovered by erosion, followed by the emergence of an “observatory-like chapel” (Wong et al. 2011). This, she proposed, might promote the circulation of oral traditions keeping alive the memory of the danger of buried nuclear waste.

These are all interventions by artists who are skeptical of the project of containing nuclear waste, and critical of the society that produced it without a plan to manage it safely. Yet even when artists are committed unironically to marking nuclear waste sites, a rejection of universal assumptions and an insistence on the local, the site-specific, is notable. Belgian artist Cecile Massart is one of four artists who participated in a 2014 conference on constructing the memory of such sites. She proposed that after closure, a living space, a laboratory for the production of art, music, and dance, should be established on the site (Massart 2015). Rather than concealing the buried waste, her proposal would mark the locations, including by installing surface marks. But these are not imagined as remaining static or preventing engagement. While not proposing to recycle the materials that are byproducts of the nuclear industry, her proposal, and others by artists imagining large-scale installations, recycles the places contaminated by these activities, in precisely the way Smithson called for in his proposals for Land art on former industrial sites.

### Nothing is Wasted; Everything is Toxic; Heritage is Everything

Proposals to mark buried nuclear waste aim to cut it off from further interaction with humans. Yet scenarios of the very near future proposed by experts suggested that geological materials today considered to be uninteresting might rapidly achieve economic importance, belying attempts to find sites where radioactive materials would remain undisturbed. We might consider this as an affirmation of the idea that ultimately, nothing is waste in the long history of humankind. If nothing is truly wasted, what might this imply for trying to think about a category of “toxic heritage”?

The experts who participated in proposing designs for markers for the US Waste Isolation Pilot Plant and any successor to be built actively debated the relationship of the site to concepts of heritage as they understood them. They repeatedly suggested that the monumental markers they proposed would work because they would be perceived as important heritage sites in the future. They wrote that “with age” these “could become recognized as a preservable, historical resource” (Baker et al. 1993, G45). A linguist involved in the project, Frederick Newmeyer, suggested “the WIPP site will quickly become known as one of the major architectural and artistic marvels of the modern world”, attracting mass tourism (Ast et al. 1993, F-149). It was from this perspective that it made sense to propose commissioning a



major piece of Land Art as part of the proposed marker. These suggestions, though, did not extend to viewing the buried radioactive materials themselves as heritage.

Heritage in its present use combines the notion of inheritance from the past and value in the present sufficient to require or justify attention and investment for management for the future. It is no accident that concepts of heritage were developed alongside nationalist projects, and today are fostered by international agencies that assign the rights to determine heritage to nations, rather than to people. Artists who work directly with radioactive materials, who imagine or implement artworks on industrial landscapes, show us that everything inherited from the past can be an occasion for some kind of response, escaping the intentions of control embraced by governments. Whether future human responses to inherited toxic materials are aesthetic, narrative, visual, or aural may truly be unpredictable. What they inevitably will be, however, is active and emergent, defying the logic of nationalism and the cultural heritage enterprise in which it is immersed that demands fixity of form or meaning.

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