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Rocky Legacies of Finnish Anti-Uranium Mining Social Movements: The Rock Art of Pessi Manner

Abstract

When international mining companies rushed to prospect for uranium in Finland in the early 2000s, localised anti-uranium mining social movements formed in different parts of the country. Among the activists was Finnish artist Pessi Manner, whose rock carvings remain the social movements' most enduring legacies. In this article, I discuss the history of uranium prospecting and anti-uranium activism in Finland, analyse Manner's interventions as examples of atomic rock art, and argue that, in using rock as his art medium, Manner was able to elicit an affective connection between feeling bodies and a landscape in need of protection, a quality that also contributes to the capacity of his artworks for future communication.

Since the beginning of the atomic age, artists have taken issue with nuclear bombs, disasters, waste, and radiation in a multitude of ways. In studies on how contemporary art practice can contribute to a cultural understanding of nuclearity, the complete nuclear cycle from uranium mining to disposal of high-level radioactive waste – as well as the development of nuclear weapons and the lingering effects of anthropogenic radionuclides in the atmosphere – has been dealt with.[1] As pertains to radiation in general, art has often been mobilised as a mode of critique and activism; a way to oppose or raise awareness of those modern technologies or practices that contribute to the environmental or health risks of radiation. Uranium, perhaps more so than any other element, lies at the core of this problem. The substance exists as a fairly common and widely distributed metal in the earth's crust from where it can be extracted and subsequently refined, enriched, and, as pertains to its peaceful applications, processed into fuel pellets used in nuclear reactors.[2] One problem with this process – and a common topic in much artistic work – concerns waste, generated both through extraction, because tailings and

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waste rock can contaminate complete landscapes, and in nuclear power plants, where fuel turns into highly radioactive waste that has to be managed for tens of thousands of years. It is this temporality of uranium – the possible social, environmental, and health risks now and in the far future – that renders it a particularly powerful subject for artistic work.

This article is about a Finnish anti-uranium activist whose artistic oeuvre consisted to a large extent of works intended to raise awareness of the possible environmental effects of uranium mining. However, before we begin our analysis of art in uranium activism, a brief history of Finnish uranium is in order.

In the wake of a renewed interest in nuclear energy in the course of the early 2000s, the price of uranium began to rise exponentially. The high prices motivated international mining companies to prospect for the commodity globally, including areas of lesser uranium potential. In Finland, where uranium deposits are small and low-grade but where mining legislation at the time was especially lenient, dozens of claim reservations were made in areas with previously known uranium potential in 2004–2009.[3] Among the companies prospecting in Finland during that period was Areva. The French company had been mapping Finland's uranium in collaboration with the Geological Survey of Finland since 2000 and now took a special interest in the Uusimaa area in southern Finland and the Koli uranium province in North Karelia.[4]

The Uusimaa and Koli areas are particularly significant in the history of uranium exploration and production in Finland. In 1958–1961, small-scale test extraction and refining of uranium ore was done in Askola in eastern Uusimaa by the energy company Imatran Voima in anticipation of the construction of Finland's first nuclear power plant.[5] The quality of the ore, however, proved to be poor and the result of the whole operation was 'no more than a bucket's worth' of uranium concentrate.[6]

Just like the uranium of the Uusimaa area was discovered during the uranium rush of the mid-1950s, the uranium potential of the Koli area was discovered as a result of citizen prospecting around the same time. In 1957, rock samples were sent by two local brothers to the newly established Atomienergia, a consortium formed in 1955 by a group of forestry companies to develop the nuclear industry in Finland. Because of the promising finds, Atomienergia quickly opened the Paukkajanvaara mine in Eno (today Joensuu municipality), the first and only uranium mine in Finland to this date. In

1959–1961, the operation, which by today's standards was exploratory and experimental, employed 100 people and turned about 27 tonnes of uranium ore concentrate, most of which was sold to the Swedish company Atomenergi (not to be mixed with the Finnish Atomienergia). However, Paukkajanvaara was closed as nonprofitable in the summer of 1961.[7]

After operations ended, Paukkajanvaara remained abandoned for decades, save for some minor activities that were part of prospecting claims in the late 1960s to early 1980s.[8] During the 1980s, surveys of the environmental impact of past uranium mining and refining at Paukkajanvaara were carried out by the Finnish Radiation and Nuclear Safety Authority (STUK), and elevated levels of radioactivity were detected in the surrounding bodies of water, fish, plants, and mushrooms.[9] In the STUK report, it was determined that to mitigate the environmental impact of the old mine, the area should be rehabilitated.[10] Subsequently, all infrastructure was demolished, the open-pit mine, shafts, and tunnels were blasted with explosives and filled with rock, the whole site was covered with a 1.5-metre layer of clay and gravel, and pine trees were planted on it. Finally, after an inspection in August 1994, the site was determined safe for outdoor use. It is, however, prohibited to disturb the soil since the site is classified as a final repository for nuclear waste under the Finnish Nuclear Energy Act (990/1987) and is monitored by STUK.

It is against this historical background that the uranium rush of the early 2000s and the local reactions – including artistic interventions – must be analysed. The prospecting targeted previously known uranium-rich areas with the above-described historical baggage, but the mining companies were also met with unprecedented social resistance when they entered the scene. Although some uranium prospecting had been carried out in Finland by domestic actors in the 1970s and 1980s, as well as opposed by contemporaneous anti-nuclear organisations, in the early 2000s the mining companies found themselves in a social and cultural environment shaped by deep(er) environmental concerns and suspicions towards the international operators.

The intensity of opposition to the prospecting is reflected in the fact that when local anti-uranium mining movements started to take form in 2006, visual art acquired a key role as a mode of intervention. Among the activists opposing uranium prospecting was Finnish sculptor Pessi Susikustaa Manner (1969–2015) whose large-scale anti-uranium rock carvings, created in 2006–2008, remain the movements' most enduring legacies. With his artworks,

planned for each Finnish municipality threatened by uranium mining, Manner wanted to raise awareness in the general public of the environmental, social, and health risks of uranium mining. The preservation of the Finnish landscape in particular was an important objective for Manner, and he often placed his works in locations with a striking view. In addition to their function as artworks and PR strategies, Manner's carvings also have a communicative function. As enduring atomic art, they transfer elements of contemporary nuclear politics far into the future.

In this article, I discuss Manner's artworks in the context of Finnish nuclear politics, uranium prospecting, and national and regional anti-nuclear and anti-uranium movements. In providing the first-ever comprehensive published documentation of Manner's atomic rock art, I also analyse them from the perspective of prehistoric rock art traditions. Finally, I conclude with a discussion on how, through their aesthetic qualities, Manner's carvings continue to communicate contemporary nuclear imaginaries into the distant future.[11] My argument is that, unlike some other forms of atomic rock carvings, Manner's artworks elicit a sense of connection between a feeling body, the materiality of rock, and a landscape in need of protection, and that the open-endedness of this affective connection is the most significant element of their function.

Anti-Nuclear and Anti-Uranium Movements in the Context of Finnish Nuclear Politics

The beginning of the uranium rush of the 2000s in Finland can be dated to 2004 when Areva submitted the first claim reservations on uranium-rich areas in Uusimaa and North Karelia.[12] In 2006, Areva was permitted a claim for five years in the municipality of Eno in North Karelia, but its applications in the Uusimaa area were rejected. Also active in North Karelia was British mining company Agricola Resources which had made claims in Eno and Kontiolahti municipalities, including areas in and around the old Paukkajanvaara site. In the north-eastern part of the country Namura Finland, a subsidiary of the Canadian company Cooper Minerals, had filed claim reservations in 2006. As direct reactions to these intensifying activities by international companies, resistance to uranium prospecting increased and local anti-uranium movements formed in different parts of the country.[13] Among these

movements were Uraaniton Kansanliike (Uranium-free citizen movement) and Uraaniton.org in western and eastern Uusimaa, respectively, both of which were founded as reactions to Areva's operations in the area. Another local movement, Uraanitieto.net (Uranium information), was formed in North Karelia, and a fourth localised movement, Ei uraanikultakaivosta Kuusamoon (No uranium gold mine to Kuusamo), in north-eastern Finland.

These movements form part of a long and varied tradition of nuclear activism globally and nationally since the 1960s, notwithstanding anti-nuclear weapons movements which have a longer pedigree.[14] In Finland, anti-nuclear power movements started to form properly in 1974 after the energy company Imatran Voima revealed plans to build a nuclear power plant in western Uusimaa, and after a siting plan was published by the Ministry of Trade and Industry for 30 new plants in different parts of the country.[15] In addition, Imatran Voima had formed an energy company with Helsinki, Vantaa, Espoo, and Kauniainen, the municipalities that make up the metropolitan area, to start planning a nuclear power plant in the vicinity of Helsinki. At the time, two plants were already being built in Finland. The construction of Loviisa 1 began in 1971 and the building of Olkiluoto 1 in Eurajoki in 1974. However, in the early 1970s, environmental organisations in Finland still saw nuclear power as a preferred alternative to coal, oil, and hydropower, and it wasn't until the dramatically intensified plans by the government and the industry to invest in nuclear power – especially in or near the capital city – that the first wave of anti-nuclear movements developed in the country.[16]

The most visible manifestation of this first wave was the foundation of Energiapoliittinen yhdistys – Vaihtoehto ydinvoimalle (Energy Political Association – Alternative to Nuclear Power) (EVY) in January 1977. The main task of EVY was to oppose additional building of nuclear power plants and to criticise the management of existing ones. The accidents at Harrisburg in 1979 and at Chernobyl in 1986 provided plenty of opportunity for expressing critical commentaries on nuclear power, and EVY formed into one of the main anti-nuclear voices in Finland. Uranium mining was intimately connected to EVY's anti-nuclear campaigning. For example, when the Finnish mining company Outokumpu announced in 1980 plans, with financial support from the government, to open a uranium mine in Pahtavuoma, Kittilä, in northern Finland, the association spent all summer talking to the local people in the area.[17] However, even with the relatively high global spot price of uranium still in the early 1980s, opening a mine in Pahtavuoma proved to be nonprofitable.

The case of Pahtavuoma was probably the first proper uranium dispute in Finland.[18]

In the course of the early 1980s, EVY continued to take a stand in uranium-related topics in their communications. In 1982, a short article was published about uranium prospecting by the Finnish company Suomen Malmi in the uranium-rich area of Palmottu in western Uusimaa, but after that, EVY's coverage consisted mainly of reports on the effects of uranium mining in countries other than Finland, often focusing on the role of indigenous populations in the disputes.[19]

With the Chernobyl accident, the global uranium rush – originally caused by the 1973 oil crisis – ended and the global price of uranium started to drop dramatically. This also marked the beginning of a 20-year hiatus in Finnish uranium prospecting and, subsequently, in Finnish anti-uranium campaigns.[20] Furthermore, due in part to the general anti-nuclear sentiments of the Finnish government following the Chernobyl accident, the need for organisations like EVY, whose main task had been to oppose new nuclear power plants in dialogue with the government, diminished. By the mid-1990s, EVY's anti-nuclear campaigns became subsumed under the more general activities of larger environmental organisations like Greenpeace (active in Finland since 1989) and the Finnish Association for Nature Conservation.

In many ways then, when the local Finnish anti-uranium movements formed in the course of the 2000s, they did not necessarily share much with the anti-uranium and anti-nuclear movements of the 1970s and 1980s, both historically and ideologically. For instance, while the central shared concerns among the activists were similar to those put forward by EVY earlier, such as the health risks or environmental effects of uranium mining or the harmful image that mining might bestow upon a municipality, the members of the newly formed activist groups were not united in their views over nuclear power in general.[21] In other words, not all who opposed uranium prospecting opposed nuclear power.[22] Furthermore, the new movements also included elements that were new to eco-critical movements. These included, for example, the involvement of the church in discussions over scientific versus alternative knowledges.[23] The question regarding the position of the church in the nuclear question had already been raised in Finland in the early 1980s but from a mass communication (read indoctrination) rather than an epistemological point of view.[24]

Another novel phenomenon was resource nationalism, an aspect that is tightly interwoven with the developments in Finnish nuclear policy.[25] In the early 2000s, the nuclear power question had become more relevant in Finland than in years. In 2001 and 2002, the Finnish parliament ratified decisions to construct a final repository for high-level nuclear waste and a third reactor in the Olkiluoto nuclear power plant in western Finland.[26] This reflected a shift in the general opinion on nuclear power in Finland. The public was no longer worried about the possibility of a nuclear disaster or risks in waste management but had instead become hopeful of nuclear power as a solution to the climate challenge.[27] In the post-Kyoto Agreement climate, where nuclear power was seen as a way forward, or at least a necessary evil, political discussions revolved around the economics and logistics rather than ecologies of nuclear power, starting with Finland's potential self-sufficiency in procuring uranium ore, and ending with storing the waste in the Finnish bedrock. However, as noted by Tuija Jartti, in the local context of the uranium disputes, resource nationalism was not so much characterised by concerns that Finnish uranium would be sold to the highest bidder and returned in the form of high-level waste, but the worry that international companies would overlook the health and environmental risks of uranium mining, problems that have been well-documented around the world.[28]

With this in mind, it is easier to understand the movements as attempts to safeguard the preservation of local cultural, natural, and economic values, especially in areas like Kuusamo and Koli which form an integral part of the nationalistic landscape imagery of Finland, and the tourism industry that has developed around those values.

The Anti-Uranium Art of Pessi Manner

Since the start, the localised cultural and environmental values were visible in the anti-uranium activities organised by the newly-formed regional movements. These included cultural events, talks, free concerts, and protests, such as the symbolic 'Suitcase march', organised by Uraanitieto.net in the town of Joensuu in autumn 2006. With the march, the residents of North Karelia were figuratively saying goodbye to their home region tainted by its uranium image.[29] Insofar as events like these continue to exist as memories in the minds of the participants, as fragments on Internet Archive's Wayback

Illustration 1. *The locations of Pessi Manner's carvings in Uusimaa, North Karelia, and Kuusamo in 2006–2008 also indicate areas with intensive uranium prospecting and local anti-uranium movements at the time. Also marked on the map are Askola and Paukkajanvaara where extraction and refinement of uranium ore were done between the late 1950s and early 1960s. Map design: Triinu Silla.*

Machine, or as written accounts in bulletins, newspaper articles, academic theses, and other scholarly publications, the anti-uranium movements' activities also included interventions of a more lasting kind. Among those anti-uranium activists whose interventions are still visible in the landscapes of the aforementioned uranium provinces, namely Uusimaa, North Karelia, and Kuusamo, was Pessi Manner. Manner, who had studied visual art in the late 1990s and early 2000s, attended a masonry program in 2004–2005. However, due to back pains, Manner did not pursue a career in masonry but instead turned to sculpting. The combination of masonry and art education affected Manner's choice of medium and motifs. In 2006–2008 Manner produced the so-called Uranium-free Finland series, consisting of carvings commissioned by environmental organisations and anti-uranium movements in Uusimaa, North Karelia, and Kuusamo (Illustration 1; Table 1).

Before creating the six carvings that make up the Uranium-free Finland series proper, Manner created *Aurinko* (The Sun, 2006) in Helsinki. The carving is located in a recreational area where a relative of Manner's stepmother owned a small summer house. This picture, which at 1.5 metres in diameter is relatively small compared to his other works, was a protest against plans to build houses in the area.[30] With the carving, Manner wanted to protect the smooth rock surfaces at the site, but the piece also provided an opportunity to perfect his carving techniques. All of Manner's carvings were made by first using a diamond saw to create the general outline of the carving and then chiselling off material by hand.[31] Manner also paid special attention to the placement of the carving and designed each cut to function as a tiny drain to lead rainwater away from the artwork and therefore better protect it from erosion.[32]

Manner's first anti-uranium carving was *Taistelu* (Battle, 2006), a sun motif with a small, golden radiation symbol carved into a steep rock face near the Palmottu area in western Uusimaa (Illustration 2). Manner himself explained that the work depicts one of the sun's rays cutting a wing off the radiation symbol.[33] In addition to the carving, the message 'Foutez le camp les terroristes de nature' was painted around it by another activist, asking the French company to leave the area. Of Manner's carvings, *Taistelu* is among those most intensely weathered and reclaimed by the surrounding vegetation. Only a thin white layer of paint remains on the trefoil, and the French message has mostly disappeared.

Title	Revealed	Municipality	Coordinates	Commissioned by	Motif	Size (metres)
Aurinko	Summer 2006	Helsinki	60.16595, 25.02426	Self-commissioned	Sun with 32 concentric straight rays	1.5
Taistelu	12 September 2006	Lohja	60.47709, 23.76802	Uraaniton Kansanliike	Sun with 32 concentric straight rays + golden trefoil	4.5
Luonto vastaa	10 November 2006	Joensuu	62.84087, 30.03199	Enon Luonnonystävät	Trefoil	2.0
Joko vai	5 December 2006	Askola	60.57063, 25.77267	Uraaniton.org	Maiden of Finland + waste rock	2.0
Päiviö	24 June 2007	Kuusamo	66.11051, 28.79543	Finnish Association for Nature Conservation	Sun with 32 concentric squiggly rays	4.5
Runo	18 June 2008	Kontiolahti	62.83825, 29.96018	Uraanitieto.net	Sun with 32 concentric wavy rays	6.5
Untitled	October 2008	Siuntio	60.10635, 24.29769	Thure Lindeberg	Sun with 36 concentric wavy rays	5.5

Table 1. *Pessi Manner's rock carvings are listed in chronological order by title, date of production or reveal to the public, current name of the municipality, coordinates, name of the commissioner, motif details, and size information.*

After *Taistelu*, Manner made *Luonto vastaa* (Nature Responds, 2006), a large ionising radiation sign in a nearly vertical rock face in the municipality of Joensuu in North Karelia, not far from the Paukkajanvaara mine (Illustration 3). The piece was commissioned by Enon Luonnonystävät and became the logo of as well as a picture on a t-shirt that was sold to support the activities of the local anti-uranium mining movement.[34] The carving can also be seen on the cover of *Atomiveisuja* (Pilfink Records, 2009), a collection of anti-uranium and anti-nuclear folk songs written and performed by the group Folkswagen.[35]

Luonto vastaa was followed by *Joko vai* (Either or, 2006) in Askola. Just like *Taistelu*, the motif of the carving differs from the majority of Manner's works and is, in the artist's words, 'the raped maiden of Finland with her lap full of waste rock'.[36] The artwork consists of a carving in the shape of the map of Finland with a heap of loose rocks laid on top of it. It remained partly destroyed until it was reconstructed in June 2024.[37]

In the remaining three works, Manner returned exclusively to the sun motif. *Päiviö* (2007), revealed to the public on midsummer, is located 422 metres above sea level on top of Naatikkavaara in Kuusamo where Namura Finland had a claim (Illustration 4). The name is difficult to translate, but it refers to Beaivi, the Sámi word for sun, and Peaivvas, the Sámi shaman or

Illustration 2. *Detail of Taistelu (2006), Pessi Manner's first anti-uranium mining rock carving. Photo: M. Marila (2023).*

noaidi.[38] On the one hand, in naming the work thusly, Manner was effectively drawing attention to the ancestrality of the land. The role and rights of the Sámi in the uranium disputes were never really discussed and, in opposing

mining, the municipality of Kuusamo, for example, stressed its impact on the environment and subsequently on tourism. On the other hand, for Manner, the use of Sámi terminology and the sun motif was a way to connect ancient and universal solar cults, which extend as far back as the Neolithic, the figure's centrality in Sámi beliefs, and the more recent discussions over solar energy as an alternative to nuclear. The location of the carving is striking, and it had special significance also to Manner who had never travelled that far north before creating *Päiviö*. It took Manner six whole days to carve the piece, during which he lived in a tent.[39]

Runo (Poem, 2008), located in the municipality of Kontiolahti, is the largest of Manner's carvings. Manner stated that the piece is a celebration of the beauty, purity, and peacefulness of the North Karelian landscape, and the connection between Manner's carvings, uranium mining, and values attached to the national landscape is evident.[40] Like *Luonto vastaa*, *Runo* is located close to Paukkajanvaara, and all three sites are situated in the national landscape of Koli. The preservation of the landscape was one of the central arguments

Illustration 3. *Pessi Manner's Luonto vastaa (2006) in Joensuu, North Karelia. Photo: M. Marila (2023).*

Illustration 4. *Päiviö (2007), the northernmost of Pessi Manner's anti-uranium mining artworks, is located on top of Naatikkavaara in Kuusamo. Photo: M. Marila (2023).*

in the anti-uranium campaign in North Karelia, but its importance can only be understood by contextualising Koli as part of the formation of Finnish nationalism. In the course of the late 19th and early 20th century, Koli became a central subject for Finnish national romantic artists such as composer Jean Sibelius, writer Juhani Aho, and painters Eero Järnefelt and Pekka Halonen. Today, Koli is the epitome of the Finnish landscape. As argued by Hiedanpää & Lovén, Koli is an example of how the 'habits, customs, and ecosystem features intertwine' and 'provide emotional inspirations, resilience and social cohesion to individuals and communities.'[41] Perhaps unsurprisingly then, *Runo* became of particular significance to the anti-uranium campaign of the congregation of Kontiolahti which on summer solstice evening on 22 June 2009 organised a service on the carving. The service drew from the theme of the *Canticle of the Sun* by Francis of Assisi and aimed to intensify God's immanence in and the sacredness of nature.[42] The carving also happens to be located next to a 19th-century copper mine; an ancient monument protected by the Finnish Antiquities Act (295/1963).

Manner's last carving, *Untitled* (2008), is located in Siuntio in southern Finland, and is, according to Manner, a celebration of the surrounding landscape and respect for nature.[43] Much like *Päiviö*, the piece is located in a very scenic spot overlooking a bay. Finland's national author Aleksis Kivi lived and wrote his most important works in Siuntio in the 1860s, and in an interview, Manner evoked the image of Kivi having enjoyed the same view.[44] The carving is therefore another example of the tactics used in attempts to safeguard the national landscape in a battle against international mining companies.

After the above-mentioned seven rock carvings, Manner created one last anti-uranium artwork: a pile of waste rock and a sun-shaped stone setting presented at the 2009 Ars Kärsämäki art festival in central Finland. No rocky traces of this piece survive.

Atomic/Rock Art

Manner is by no means alone in addressing uranium in his art. Other examples include Bob Wiseman's *Uranium* which addresses the effects of uranium in Canadian miners' bodies through the use of voice, music, and humorous puppetry. As argued by Andrew Mark, with *Uranium*, Wiseman succeeded

in activating the audience's ecological consciousness through performing arts, thereby heightening their environmental awareness.[45] Tea Andreoletti's participatory performance *YELLOWCAKE* recollects the oral memories of a 1970s anti-uranium movement in the valley of Alta Valle Seriana near the artist's hometown of Gromo, Italy, and reflects on them through the preparation of a communal feast including polenta, a yellow porridge typical of the region.[46] Grit Ruhland's *Marker for Halde Stolzenberg* is a bronze statue of a three-legged badger and builds on folk tales of three-legged animals as harbingers of disease and death.[47] Ruhland has suggested that many regions with a high concentration of such folk tales became locations for uranium mines in the 20th century.[48]

Whereas these three artists aim to expose the histories, localities, and agencies of uranium ore through the elicitation of bodily functions (consumption, disease, death), Manner's practice was based on the establishment of an aesthetic connection between the body, materiality of rock, and, ultimately, an entire (rocky) landscape. My argument is that, in spending hours on chiselling a figure into the bedrock, Manner was primarily evoking ideas of the ancestrality and affectivity of creating rock art.

In northern Europe, the practice of carving images into rock dates back 10,000 years, culminating in the rich galleries of Late Neolithic and Bronze Age carvings of southern Scandinavia.[49] In northern Scandinavia and Finland, however, the oldest rock art is rather painted images than carvings. In the southern Scandinavian imagery, the sun motif, often connected to an image of a boat, is central, but in the so-called circumpolar art of the northern regions, the sun appears sporadically at best.[50] It is, however, not only the iconography of ancient rock art that is of importance when assessing its relevance to the aesthetics of Manner's anti-uranium carvings but equally important are the corporeal aspects related to making them. If prehistoric rock art was once regarded as a symbolic manifestation of social relationships and hierarchies, more recent views stress that it cannot be reduced to visual imagery alone, highlighting instead the embodied, multi-sensorial, and affective dimensions of producing and experiencing the art.[51]

It is therefore the aesthetics of rock itself rather than the imagery that we should aim to understand when studying rock art, prehistoric as well as modern. Antti Lahelma has, with support from theories on Stone Age shamanism and animism, suggested that some Finnish Stone Age rock art formed as a result of the ritual act of touching the rock repeatedly over a

long period, and that the locations were chosen for the specific qualities of the rock, including anthropomorphic shapes in the morphology of the cliff, distinct cracks and grooves in the rock, or the echoes that the cliff would reflect when people interacted with it.[52] In other words, rock art was created in places of importance, not only because the images themselves were important. Fahlander has made a somewhat similar case for the mediality of rock through a comparative analysis of the layeredness, or lack thereof, of ancient rock art and contemporary graffiti, suggesting that carving or painting over certain images was avoided because they reflected a connection to the place and the medium.[53] These approaches suggest that there is an indexical connection between a landscape, the rockiness of the art, and the embodied materiality of human cognition, experience, and interpretation that becomes evident through interacting with the rock.[54] After all, it was the materiality of rock that was the cause of Manner's back pain.

It is important to notice that, in addition to being part of the rock art tradition, Manner is not alone in using rock as a medium for anti-uranium or anti-nuclear communication either. To understand how intimately his works make use of the materiality of rock, I take up two examples of attempts to communicate energy politics through rock, one from Finland and one from Sweden where the histories of nuclear politics and uranium production share many similarities.

As part of Sweden's mid-20th-century policy to attain self-sufficiency in nuclear energy production, about 215 tonnes of uranium concentrate was produced at the Atomenergi-owned open-pit uranium mine and processing facility of Ranstad in the province of Västergötland in southern Sweden in 1965–1969.[55] By the late 1960s, however, the increasing global supply of uranium started to sink the price of uranium and Ranstad was closed as nonprofitable. When the market started to recover again after the 1973 oil crisis, the Swedish state-owned mining company LKAB published plans to continue producing uranium at Ranstad.[56] This caused heavy opposition in the local population and environmental organisations. To facilitate protests, a 'Day of the Västergötland Mountain' was planned by Skövde Miljöforum to be held in May 1976. One day turned into two weeks of events instead, attracting as many as 20,000 people to protest against uranium mining in the area.[57] As a result, mining never continued, and the facility was finally demolished in 1991. After the protests, a memorial stone was erected.[58] In the rune stone type monolith, which now stands in front of Häggum church

about a kilometre from Ranstad, is carved the following message (author's translation from Swedish):

> Devastation threatened Billingen, Borgundaberget, Gerumsberget, Tovaberget, Gisseberget, Myggberget, Mösseberg, Plantaberget, Varvsberget and Ålleberg. Västgötar willing to protect their village gathered in May 1976 in Häggum. This stone should remind us that the anger of Västgötar befalls those who damage their mountains.

A similar example of an attempt to memorialise energy politics in stone is known from Finland. In 1983, members of EVY founded Vihreä Mutantti (Green Mutant), an association that called for action on the nuclear waste issue and opposed governmental decisions to license new nuclear power plants or extend those of existing reactors. As part of their activism, Vihreä Mutantti planned a two-phase intervention called *Muistio* (Memo). In the first phase, the names of those politicians, state officials, energy company executives and, importantly, their unnamed offspring, that the group held responsible for introducing nuclear power in Finland, would be carved in stone. Part two would also be a list of names, but in addition to the aforementioned, it would include also researchers, artists, and other cultural influencers who had supported nuclear power or belittled the dangers of nuclear waste.[59] On 6 April 1983, the group executed the first phase of *Muistio* by carving a list of 27 names into the bedrock on the museum island of Suomenlinna, now a UNESCO World Heritage site, in Helsinki.[60] After 40 years, the carving is almost illegible.

The original motivation for Vihreä Mutantti and their *Muistio* was undoubtedly a campaign that was launched in 1982 by Imatran Voima and Teollisuuden Voima, the companies that owned the two operating nuclear power plants in Finland at the time, to build a new reactor in one of the plants. After an application was submitted to the Finnish government, it was withdrawn in 1986 following the Chernobyl accident. This meant that there was no immediate need for Vihreä Mutantti to proceed to the second phase of their intervention. Another application for a new reactor was submitted in the early 1990s, but it wasn't until 2002 that a governmental decision-in-principle to build Finland's fifth reactor at the Olkiluoto plant was ratified by the parliament.[61]

Discussion: Future Communication

Although the above examples from Sweden and Finland use rock as a medium for communicating anti-nuclear and anti-uranium aspirations, they differ crucially from Manner's artistic approach which, by communicating very directly the sensation of working with rock, evokes an affective connection to the medium rather than the message. In comparison, Vihreä Mutantti and the activists at Ranstad relied on bureaucratic, cognitivist, and rationalist tactics in attempting to communicate their nuclear politics into the future. Manner once stated that he became involved in the anti-uranium movements after spending a night outdoors in the same landscape that later became the location for his first carving in Lohja, waking up in the morning, and realising what was at stake in the uranium rush.[62] As strategies for the anti-uranium campaigns, Manner's carvings were successful in eliciting similar feelings of nature appreciation in the audience.[63] For instance, at the time of the making of *Taistelu* (2006), a political petition by Uraaniton Kansanliike had been signed by 2000 people. After the carving's reveal the petition gained a further 5000 signatures.[64]

Manner's carvings will most likely outlive the institutions that commissioned them. Manner gave his works a 2000-year guarantee and thought that, at the latest, they would disappear with the next ice age.[65] According to estimates, this could mean anything between 50,000 and 100,000 years. Manner was therefore aware that his artworks could continue to convey contemporary energy politics far into the future, but he never elaborated on the finer details of this function. The solar motif, for instance, which makes up five of the seven works, was an explicit attempt to communicate to future generations that solar power should be preferred over nuclear. Regardless of the centrality – and intelligibility – of the sun to the anti-nuclear movements of the 20th century[66], it is useful to notice that the connection between the solar icon and solar power is highly contextual. Weart, for instance, has shown how the solar fireball icon has been used to represent energy sources in general, not only solar.[67] It is therefore possible that Manner's carvings could simply be interpreted to indicate a source of energy in the bedrock.

The ambiguity of Manner's chosen iconography also connects them to warning signs or markers intended to indicate the location, contents, and risks of the highly radioactive material buried in long-term waste repositories. Because the waste can remain harmful to biological life for up to 100,000

years, the challenge is whether and how to mark the repository so that future generations will not come into contact with the waste inadvertently.[68] Because natural languages can disappear and figurative symbols such as pictograms can be read or interpreted in many ways, one strategy has been the so-called affective deterrent. One example of the affective deterrent is an architectural structure built on top of the repository and meant to elicit, by recourse to the indexical connections between materialities and bodies, the feeling of strangeness and danger in the potential future visitor.[69] The strategy builds on the same phenomenon – or hope rather – as recent archaeological attempts to interpret ancient art: that the rock, or any other material for that matter, will function as a medium for feeling rather than cognising the meaning of the message (Illustration 5).

However, as argued by Andrew Moisey, affective deterrents, whether structures or artworks, can have a dual function: in addition to eliciting aversion, they are more likely to arouse curiosity as to the reasons for constructing the marker.[70] In Moisey's analysis, the affective deterrent is not only motivated by a concern for the well-being of the future visitor but also pride over humanity's ability to harness the atom in the first place. As such, affective deterrents, much like Manner's carvings, can also be seen as apologias, acts of environmental atonement or sacrifice, simultaneously reflecting guilt and pride, perhaps reflecting what Alvin Weinberg referred to as the Faustian bargain between 'nuclear people' and the society.[71] It is therefore ironic that, in placing the figures in areas that had both seen uranium extraction (Askola and Eno) and were now threatened by possible uranium mining, Manner effectively marked uranium-rich areas for potential use by future generations. Importantly, the dual function of the marker is also the reason why, for example, the Onkalo repository for high-level radioactive waste in western Finland is intended to remain unmarked after closure.[72]

Whether the ironies found in Manner's carvings were intentional or not, it is more obvious that the decision to carve them was an affective reaction to the perceived possible health and environmental risks of uranium prospecting, risks that remain poorly understood at best. And herein lies part of the power of his artworks. Because the interpretation of the carvings' iconography remains open-ended, it shifts the viewers' attention to the indexical connection between their embodiedness and the material qualities of rock and working with it. Rather than transmitting a clear policy statement ('Do not dig here!'), this connection serves as the foundation for communicating

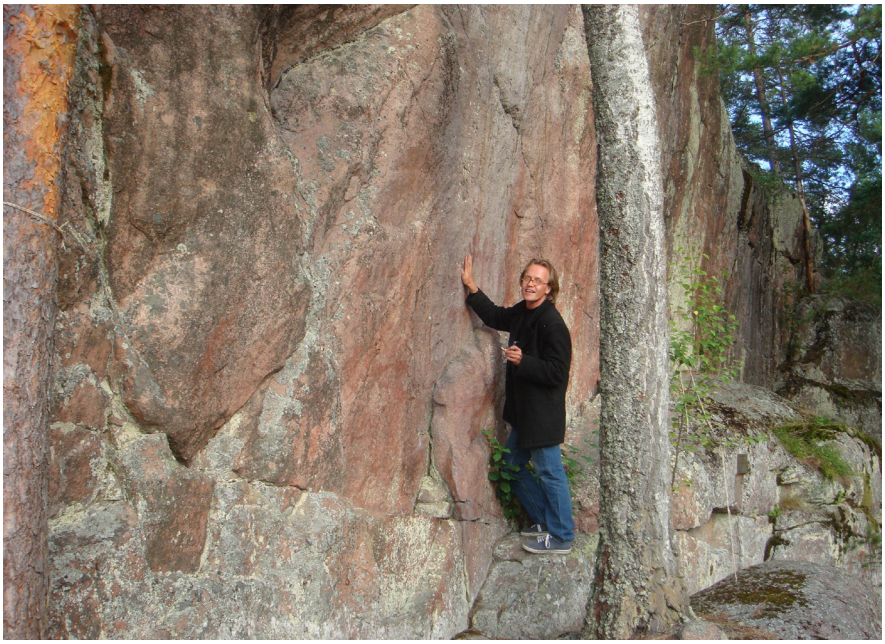

Illustration 5. *Pessi Manner at the Juusjärvi Stone Age rock paintings in Kirkkonummi, western Uusimaa, in July 2009. The paintings are known for depictions of human individuals in the process of assuming the shape of a snake.*[73] *Photo: Merja Uusivirta. Reproduced with permission.*

with future generations the innate paradoxes and contradictions of nuclear politics, such as the relatively rapidly changing general opinions about nuclear power as environmentally detrimental or beneficial, or the extreme difficulty to demonstrate the long-term effects of low-level radiation.

For instance, to the proponents of the pro-uranium camp, possible health and environmental risks of uranium were connected to mining, not prospecting.[74] In the heat of the uranium disputes, geologist Toni Eerola suggested that the attempts to oppose uranium prospecting were futile because, at that time, the reservation mechanism under the Finnish Mining Act meant that reservations would be granted by the Finnish authorities automatically.[75] In other words, according to Eerola, the activists confused prospecting for mining and should have waited with their demonstrations until applications for mining licences had been planned or submitted. It is therefore perhaps even more ironic that, in the beginning, not even the Finnish authorities knew the real extent of the activities because at that time

a claim reservation could be made without explicating what minerals the exploration targeted.

Be that as it may, none of the prospecting done during the uranium rush of the early 2000s led to actual mining, and by 2012 all companies had seized their uranium operations in Finland. Those that remained started looking into other minerals instead, mainly gold. The anti-uranium movements saw this as a win and a result of their campaigns, but a more likely explanation is that, despite the high global price of uranium, the projects were cancelled because no deposits worth extracting were found. The anti-uranium campaigns did, however, impact Finnish mining through an update in legislation in 2011. Whereas the old law from 1965 (503/1965) allowed the exploration of all minerals under the right of public access, according to the updated Mining Act (621/2011), the simple exploration for uranium and thorium requires a special permit, possibly an environmental impact assessment, and the agreement of the municipality, including the hearing of the residents of the area.

Nevertheless, none of these developments negate the environmental effects of past uranium prospecting. Insofar as Manner's artworks can be counted among the most enduring legacies of the anti-uranium movements, theoretically causing marginally elevated radon levels due to the exposed rock, they hardly compare to the thousands of drill holes and cuts left behind by uranium prospectors and experimental miners during 70 years of activities in the Finnish landscape. The traces of past uranium ventures are still visible in the landscape, reminding us of the countless failed attempts to make use of Finnish uranium. This is to say that uranium as a commodity is an ongoing process with lingering effects. Even if Manner's artworks – despite their relative success in connecting bodies through rock to a complete (rocky) landscape in need of protection – should fail to communicate the mid-00s energy politics far into the future, they memorialise uranium as another ongoing 'slow disaster'.[76] This temporal scale only highlights the contradictions and paradoxes of low-level radiation as something that can be simultaneously detrimental and conducive to life.[77] According to more recent studies, past activities at Paukkajanvaara, for example, continue to cause elevated levels of radiation in the surrounding environment, and although – or perhaps because – low-level radiation at the site is mitigated by the presence of radon-consuming bacteria, it remains unclear how that radiation will affect the countless individual feeling bodies that continue to inhabit the site far into the future.[78]

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