

Sven Lütticken  
**Shattered  
Matter,  
Transformed  
Forms: Notes  
on Nuclear  
Aesthetics, Part  
2**

01/20

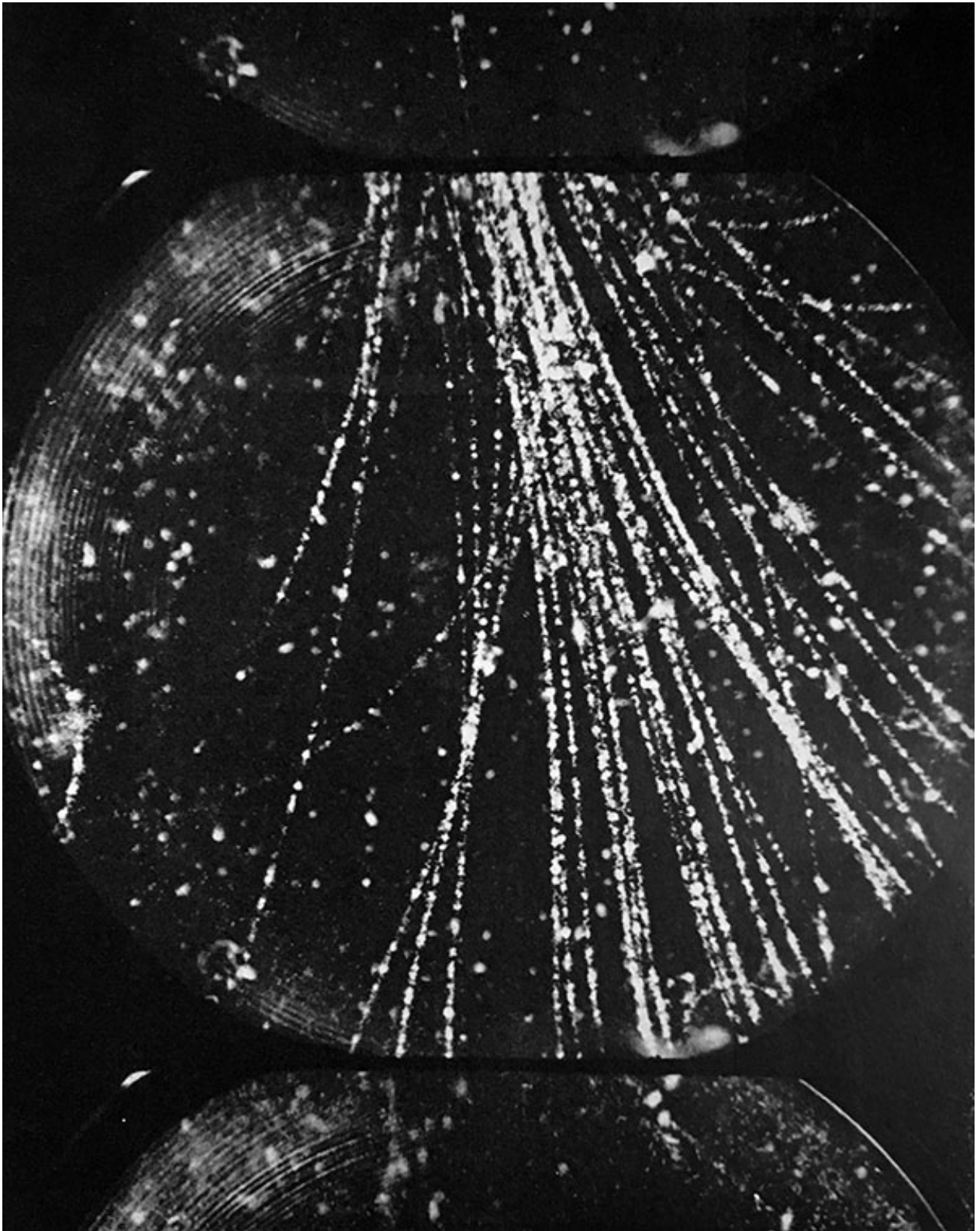
e-flux journal #96 — January 2019 Sven Lütticken  
Shattered Matter, Transformed Forms: Notes on Nuclear Aesthetics, Part 2

Continued from Part 1

### 3. Reality After Realism

Together, Wilhelm Röntgen's discovery of X-rays in 1895 and Henri Becquerel's discovery of radioactivity the following year suggested to artists that reality as it had hitherto appeared had been abrogated. As Kandinsky noted: "The collapse of the atom was equated, in my soul, with the collapse of the whole world. Suddenly, the stoutest walls crumbled. Everything became uncertain, precarious and insubstantial. I would not have been surprised had a stone dissolved into thin air before my eyes and become invisible."<sup>1</sup> X-rays would feature prominently in Kandinsky's Bauhaus colleague László Moholy-Nagy's book *Malerei Fotografie Film* (1925/27).<sup>2</sup> The avant-garde of the 1920s and '30s certainly had a profound investment in realities below the threshold of visibility – and in technical operations that would introduce them into the visual by changing the nature of the image. Moholy-Nagy's "new vision" and Walter Benjamin's "optical unconscious" are cases in point. Akira Mizuta Lippit has argued that psychoanalysis, X-ray technology, and cinema, all developed or discovered around the same time, were the essential techniques of "aviscuality" of the early twentieth century, promising to make things and the mind transparent.<sup>3</sup> Film and photography were credited with the power to make the world manifest itself in unprecedented ways, beyond nineteenth-century realism, and beyond the capabilities of the human eye. One might say that "[vision] and viscosity have come to be culturally supervalued," but one also needs to acknowledge the coexistence of different visibilities, and their mutual critique.<sup>4</sup>

The 1956 book *The New Landscape in Art and Science* by Moholy-Nagy's former student György Kepes includes photos taken in cloud chambers.<sup>5</sup> Developed by C. T. R. Wilson in the early twentieth century, cloud chambers reflect the central role played in the development of particle physics by photographic technologies. Ionizing radiation effects atoms by knocking off an electron (which is what makes radiation harmful to living tissue); in the cloud chamber, the ionized particles become condensation points, and the trails left by the rays become visible on the photographic plate as lines of condensation.<sup>6</sup> By the 1930s, experimenters such as Marietta Blau were also using photographic emulsion directly to register radiation tracks, without the aid of a cloud chamber – a return to the "photogram" approach of Becquerel's discovery, but with the setup now being calibrated so as to register individual ionization tracks.<sup>7</sup>



Cloud chamber photograph from György Kepes' book *The New Landscape in Art and Science* (Paul Theobald and Co., 1956).

**Démasquez**  
**les physiciens**

**Videz**  
**les laboratoires**

Adhères au Comité de Lutte Anti-Nucléaire, 25, avenue Paul-Adam, Paris (17°)

Pamphlet by André Breton et al., *Démasquez les physiciens, videz les laboratoires!* (1958).

If, for Moholy as for Kepes, photography revealed a new vision that had to be retranslated into human terms, certain strands of photo and film theory (and certainly the common, popular understanding of photography) have naturalized the photographic image by equating it with a reality that viewers are accustomed to. This ontological superiority of the photo is an indexical one: “From a real body, which was there, proceed radiations which ultimately touch me, who am here,” in Roland Barthes’s words.<sup>8</sup> But these “radiations” take on a stable visible form: as Tom Gunning has argued, the photo is marked by a particular intertwining of indexicality and iconicity, resulting in a unique aura of “visual accuracy and recognizability.”<sup>9</sup> But not all forms of photography are equally “iconic” in Peircean terms. In *Malerei Fotografie Film*, Moholy-Nagy opposed pictorialist photographs that mimic conventions of nineteenth-century painting to “new vision” images that are not as instantly readable. Kepes’s cloud chamber picture is as indexical as a photo of your grandmother, yet it needs more instructions to become “readable” as an image of radiation. An index is a sign that operates through physical contact; this could be photons affecting the emulsion in analog photography, or being translated into pixels in digital photography. It could be X-rays or gamma radiation revealing an “avisual” visibility. No wonder that the index is easily interpreted as a “natural sign,” as pure causality. This is the index that “shouts from reality, but doesn’t say anything at first,” in Diedrich Diederichsen’s words.<sup>10</sup> Thus conceived, the index is a proto-sign at best.

However, for Kepes, cloud chamber photos intimated a subatomic “preformation” of reality that suggested ways of structuring reality on the human level: atomic design. As with Moholy-Nagy’s X-rays, the images of the “new vision” supposedly gave pointers for constructing a new world – perhaps still capitalist, but transcending nineteenth-century bricks and mortar. The surrealists agreed that atomic and nuclear science – which was both materialist and surreal – shattered the old worldview and promised new ways of understanding and altering reality. Not, of course, within the design regimes of a Bauhaus or MIT. Rather, the revolutions of science necessitated a fundamental break with the society that techno-science and industrial design tried to optimize. Wolfgang Paalen, who lived and worked in Mexico during World War II after having broken with Breton’s group, claimed in a 1944 interview: “It seems to me that we have to reach a *potential* concept of reality, based as much on the new directives of physics as on those of art.”<sup>11</sup> Freed from Breton’s tutelage,

Paalen embarked on a crusade against dialectics, reserving special scorn for Engels’s notion of a “dialectics of nature,” which made the category mistake of applying logical categories not only to history, but even to the natural world.<sup>12</sup> If Sohn-Rethel attempted to dialecticize natural science, for Paalen science sealed the bankruptcy of dialectical materialism.

However, while Paalen attacked Engels’s famous law of the transformation of quantity into quality as nonsense, he effectively presented his own version of surrealist dialectics by arguing that “[the] new Quantum Physics is compelled to abandon the rigorous determinism that until now was held to be the very foundation of physics,” which in turn undermined physics’ “pretension of offering us a purely quantitative and yet satisfying interpretation.”<sup>13</sup> This in turn had to have consequences for art as the domain of *qualitative* experience, albeit one that had often been made subject to pictorial rules and “laws.” As Paalen phrased the relation between advanced science and advanced art: “Quantitative physics, in perceiving that the causal concept becomes inapplicable in the microscopic domain – and painting, in abandoning the causal development of plastic relations – is the same revolution.”<sup>14</sup> The “new physics” having abandoned causality and certitude for potentiality and possibility, Paalen adopted the Greek term *dynaton* (the possible) for his art. Abbreviated to *Dyn*, this became the name of the journal he published from Mexico – in part to remain a presence in the New York art world.

Roberto Matta’s characterization of Paalen as “the first painter of the Atomic Age” irked the latter, who complained about it in a letter written a few weeks after the Hiroshima and Nagasaki bombings.<sup>15</sup> To Paalen, it seemed that Matta was compromising his work with his comment, placing it in an illustrative relation with Hiroshima and Nagasaki. And did Matta himself not literally function as the new age’s illustrator, with his drawings for Denis de Rougemont’s book *Lettres sur la bombe atomique*, published by Brentano’s in New York shortly after WWII?<sup>16</sup> In fact, Paalen did respond quite directly to the double nuclear event of August 1946 with a play he completed the following year, *The Beam of the Balance*. In a post-Hiroshima counterpoint to his earlier praise for the new physics, Paalen’s play is a sci-fi allegory on the dangers of nuclear power in the hands of all-too-human scientists and barely human politicians. As Paalen notes in the “Brief Outline” for his play, “Reality has, at last, become big enough to do away with realism ... The incommensurable explosions of 1945 have not only smashed cities but also shattered consciences. The same men who have been able

to release forces beyond the dreams of yesterday, have proved inadequate to tell us what to do with these forces.”<sup>17</sup>

Convinced that only an artistic “liberation of the imagination” could result in the “broadening of vision” necessary to deal with the new (un)reality, Paalen opens his three-act play with a cosmic vision set among the stars: “Cosmogons,” great cosmic forces, watch stars and/or planets (Paalen seems not to care about the distinction) blow up one after another, as civilizations develop technologies they cannot control. Earth, we hear, still hangs in the balance – there is a “decisive struggle” going on, and in the three acts to follow we witness that struggle, involving a scientist (Prometheus/Faust), an ape-like, brutish dictator whose name (Gori) is a reference to Stalin’s birthplace, and a stand-in for Paalen himself named Frank. The first two acts are set in a post office that is crumbling under the unleashed power of “anagravity,” which has been unlocked by Prometheus/Faust and stolen by Gori – and which is Paalen’s stand-in for nuclear power. In the third act, Prometheus and Frank return to a postapocalyptic earth, having absconded with a spaceship when things went really wrong; they find a wasteland, but Gori is still alive and unchanged. Disappointed with Marxism and with surrealism, Paalen retreats to a position of bourgeois humanism. The resulting critique of human folly is prevented from being truly withering by its general and abstract nature.

A reading of *The Beam of the Balance* took place at Robert Motherwell’s house; the year before, Motherwell had published a collection of Paalen’s writings, *Form and Sense*. Motherwell’s fellow post-surrealist, Barnett Newman, saw in Hiroshima the need for a new tragic culture. In his essay “The New Sense of Fate” (1948), Newman praised Greek tragic poetry to the detriment of Greek visual art (sculpture), which had no real sense of tragedy and was focused on physical beauty. Newman noted that after WWII, the artist “has more feeling and consequently more understanding for a Marquesas islands fetish than for the Greek figure.”<sup>18</sup> The war was the gruesome realization of surrealism, making much surrealist art look very *recherché* and aesthetic in the process:

The war the Surrealists predicted has robbed us of our hidden terror, as terror can exist only if the forces of tragedy are unknown. We now know the terror to expect. Hiroshima showed it to us. We are no longer, then, in the face of a mystery. After all, wasn’t it an American boy who did it? The terror has indeed become as real as life. What we have now is a tragic rather

than a terrifying situation.<sup>19</sup>

While there are notable exceptions, especially in literature and the cinema, on the whole the art of the “first responders” of the late 1940s and ’50s tended to stage the postwar nuclear age as *existential tragedy* rather than as a political issue.<sup>20</sup> In his conclusion, Newman asks and asserts: “Shall we artists make the same error as the Greek sculptors and play with an art of overrefinement, an art of quality, of sensibility, of beauty? Let us rather, like the Greek writers, tear the tragedy to shreds.”<sup>21</sup> In much 1950s art, the possibility of a total and remainderless destruction of culture and of life is evoked, yet at the same time symbolically conquered through the proliferation of tattered, ravaged, or starkly simplified and thereby sublime and existential forms.<sup>22</sup> In 1958, during an antinuclear conference in Tokyo, the philosopher and antinuclear activist Günther Anders visited the memorial of the nuclear bombardment in Hiroshima. Its abstract arch, which only appeared symbolic “because the non-functional always suggests symbolism,” reminded him of American abstract expressionism and its endorsement by the US, even by the War Department itself.<sup>23</sup>

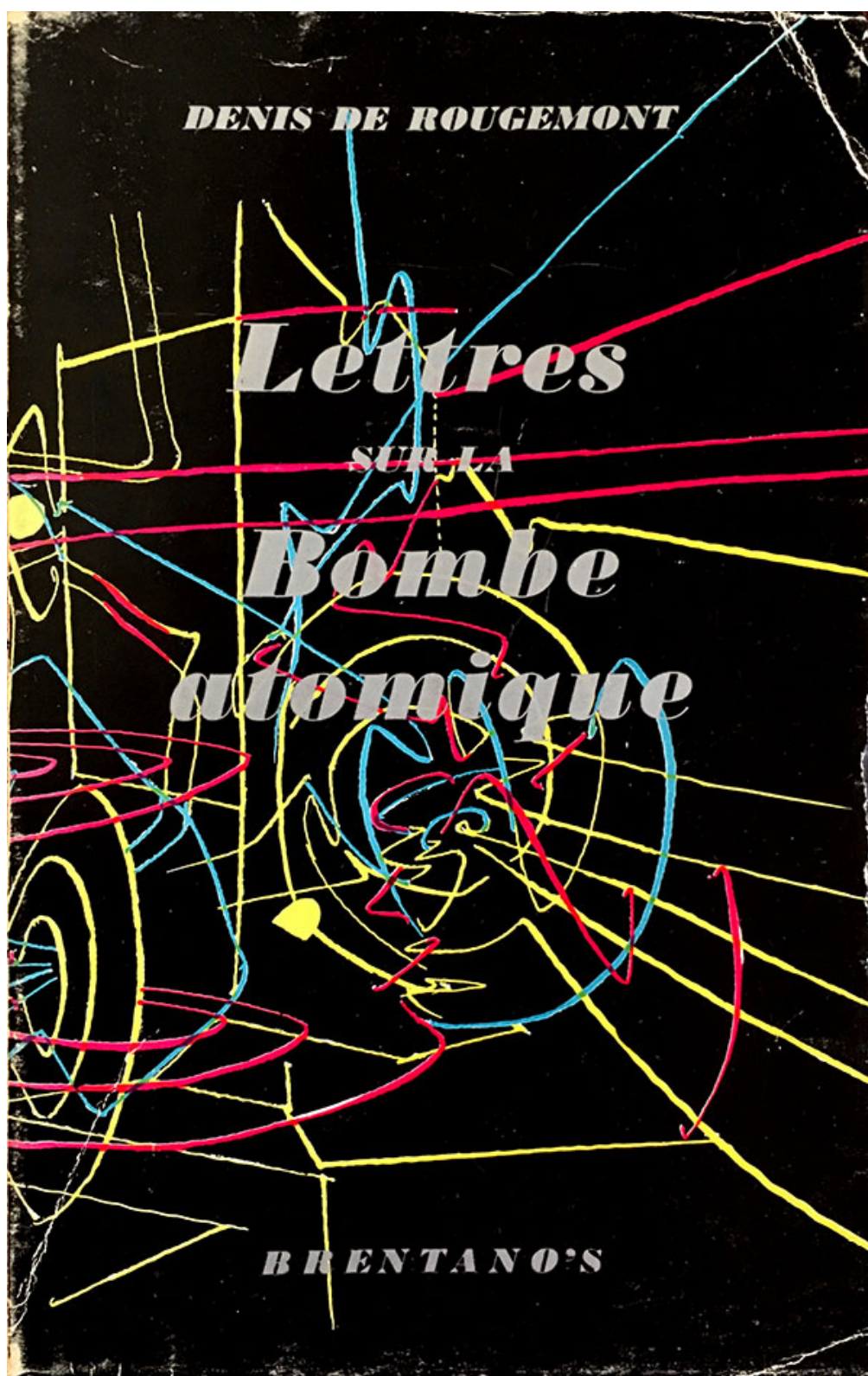
It is no coincidence that this belated official preference for the destruction of figurative forms in art (the propaganda for enjoyment of this destruction and the mocking of those who did not go along with this artistic progress) occurred simultaneously with the actual destruction of the world; nor is it a coincidence that the dress rehearsal for this destruction, which occurred in Hiroshima, found its memorial in a “non-objective object.”<sup>24</sup>

Anders’s unwillingness to see in abstract expressionism anything but a politically motivated rip-off of prewar European modernism is obviously problematic, but his suspicions of the open, noncommittal nature of the pseudo-symbolism of such art are worth pondering. In Europe, certainly, Lucio Fontana and other artists of the *spazialismo* movement courted “nuclear” connotations with certain of their forms (swirls comparable to the patterns of electrons, and so on). More explicit, and moving beyond such abstract symbolism, was the post-surrealist movement of *arte nucleare* launched in 1951–52 by Enrico Baj and others.<sup>25</sup> In 1952, Baj painted the *Manifesto Bum* (Boom Manifesto), featuring a black mushroom-cloud-shaped head against an acid lemon background overlaid with nuclear slogans and formulas. At the center, the text says that “People’s heads are charged with

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Cover of Denis de Rougemont's book *Lettres sur la bombe atomique* (1946) with cover art by Roberto Matta.

explosives. Every atom is about to explode. The blind, which is to say the non-nuclears, ignore the situation.” While this seems to sound a note of warning, the text on the left picks up on the utopian dimension: “Forms disintegrate. Man’s new forms are those of the atomic universe.” Again, dreams of a new vision: *arte nucleare* was a profoundly ambiguous undertaking.

In 1953, the critic Beniamino Dal Fabbro asked,

Was not matter, exactly like painting, disintegrating under the dangerous bombardments of physics and chemistry? So we should allow the Nuclearists to say that they imitate, that they represent the dances of the nuclei, the battle of the atoms, the molecular whirlings, the encounters of ions with electrons. In origin, after all, the Nuclearists are romantics in revolt, against the academic classicism of the Abstractionists.<sup>26</sup>

This revolt, however, increasingly took the movement beyond even more expressionist evocations of “molecular whirlings”; the art underwent a figurative turn, showing blob-like, disfigured beings in a primitivist style. Rather than dancing nuclei, some of the work appeared to evoke nuclear blasts and fallout-riddled wastelands. Still, the lure of micro/macro analogies remained strong, as a text by Asger Jorn shows:

I have noticed a tremendous desire to fathom blots, whirls, and all kinds of dripping, to mould forms, images, and symbols, as if out of a primitive chaos; little by little to reduce every possible chance-event; to condense a clot of phosphorous enamel around the symbols that change themselves from “nuclear” into “natural.” In these symbols is stored the nucleus of the artistic language necessary for the expression of this new world that we feel is creating itself about us day after day.<sup>27</sup>

#### 4. Protesting Mutants

Jorn participated in the *arte nucleare* movement later in the decade, and Baj was involved in Jorn’s *Mouvement International pour un Bauhaus Imaginiste*; in 1960, André Breton and Marcel Duchamp included work by Baj in the last major surrealist exhibition, “Surrealist Intrusion in the Enchanters’ Domain” at the D’Arcy Galleries in New York, and two years later Breton wrote an essay on the artist that would be included in the definitive edition of *Surrealism and Painting* – in which he notes that Baj illustrated Lucretius’s *De*

*rerum natura* as “a first celebration of an atomic vision of the universe.”<sup>28</sup> *Arte nucleare*, then, belongs to the postwar afterlife of surrealism and to the prehistory of the Situationist International; it is the historical avant-garde morphing into the neo-avant-garde.

The introduction to de Rougemont’s *Lettres sur la bombe atomique*, which was illustrated by Matta, states that the latter “was always drawn to modern physicists’ work on wave propagation and radiation, and to the huge transformations that scientists had imposed on matter.”<sup>29</sup> However, his illustrations for de Rougemont’s book reflect an anthropomorphic turn in his work, characterized by emaciated figures Matta often referred to with the term *vitreur*. These *vitreurs* appear to inhabit the universe of *Les Grands Transparents* – André Breton’s “new myth,” which had been launched in “Prolegomena to a Third Surrealist Manifesto or Not,” published in *VVV* in New York in 1942. That same year, Breton’s speculative fiction was also included in the “New Myths” section of the *First Papers of Surrealism* exhibition catalogue.<sup>30</sup> The “Great Invisibles” or “Great Transparent Ones” were supposedly *giant invisible creatures*. What if we were surrounded by higher beings that our senses cannot perceive? What if we are nothing but the pets or parasites of these invisible beings? In *VVV*, Breton’s text was illustrated by Matta, who always maintained that he had provided Breton with the idea for *Les Grands Transparents*.<sup>31</sup> Whereas Breton interpreted them more literally as enormous invisible beings, for Matta they were waveforms.<sup>32</sup>

Breton’s myth of the Great Transparent Ones would be revived by Louis Pauwels and Jacques Bergier in the final “Reverie on Mutants” section of their 1960 bestselling book *Morning of the Magicians* (*Le Matin des magiciens*). They merged Breton’s myth with the sci-fi trope of super-/post-human mutants that are among us, unobserved, referencing A. E. Vogt’s classic sci-fi novel *Slan*. They write: “As Andre Breton said, when imagining the presence among us of ‘Great Transparent Beings,’ it is possible that they escape our observation thanks to some form of camouflage of the kind adopted by mimetic animals.”<sup>33</sup> While Breton had noted that these putative beings are above us “on the animal scale,” suggesting that they have evolved beyond the human, there is no suggestion that these beings are new mutants. In a manner that must have been profoundly offensive to Breton, Pauwels and Bergier continue: “‘The New Man is living amongst us! He is there! What more do you want? I will tell you a secret: I have seen the New Man. He is intrepid and cruel! I was afraid in his presence!’ Thus spake a trembling Hitler.”<sup>34</sup> Obviously, there is no source for this grotesque

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Enrico Baj, *Manifesto Nucleare BUM*, 1951. Varnish and acrylic on canvas. 104 x 94 x 3.6 cm. Private Collection



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Susanne Kriemann, *Pechblende (Prologue)*, 2016. Plexiglas-sheets, inkjet prints on Hahnemühle PhotoRag, suspenders. Exhibition at Prefix ICA, Toronto.

assertion, which is one among many in a work of esoteric pseudo-history that is suffused with an odious fascination for the “secret knowledge” supposedly possessed by the Nazis.

In 1961, Pauwels and Bergier went on to found the magazine *Planète*, in which they continued to present a hodgepodge of suggestive exercises in historical fiction or mythologizing history under the name of “fantastic realism,” zapping between prehistory and ancient civilizations and impending future mutations, again with a particular fascination for supposed occult Nazi knowledge and practices. The first issue alone contains an introduction by Pauwels on “a changed world in which humans begin to suspect that they may be in the process of mutating”; notes on a book on the Third Reich that dwells on the “fascination” Nazism exerts on the “people of the 1960s,” with an image caption characterizing Himmler as “the incredible Himmler”; texts on Lovecraft and the French philosopher and Jesuit priest Pierre Teilhard de Chardin; and more Pauwels speculations on a “new Renaissance” marked by a quest both for the lost or disappearing knowledge of ancient and aboriginal cultures and by the search for life in outer space, with “intelligence undergoing a mutation.”<sup>35</sup> Still in the inaugural issue, Pierre Guérin speculates on extraterrestrial life while challenging traditional views of Man as the end point of evolution; the editors made sure to include subheadings lifted more or less straight from *Morning of the Magicians*: “A Species Beyond Man,” “The Problem of Mutations,” and “If Mutants Were Among Us ...”<sup>36</sup> Pierre Restany, meanwhile, presents *nouveau réalisme* as a potential first step towards the New Renaissance; as Gavin Parkinson notes, after Yves Klein’s death in 1962, Restany would unabashedly write about Klein as a prophetic mutation of the human species.<sup>37</sup>

Today’s speculo-accelerationist art-and-theory complex sometimes reads like the posthumous triumph of *Planète*. If Nick Land had been around in 1961, he would have been a featured author in that magazine. Tellingly, a blurb on one of Graham Harman’s books claims that his style “evokes that of a William James merged with the spirit of H. P. Lovecraft.”<sup>38</sup> Speculative theory seeks to purify philosophy of the element of praxis while endowing it with some of the aura of speculative fiction. It turns out that the *Ding an Sich* is Cthulhu. It is telling that the reference here is not to, say, a figure like Alexander Bogdanov, but to a protofascist mythmaker who already played an extremely problematic role in *Morning of the Magicians* and *Planète*.

As Gavin Parkinson’s admirable reconstruction shows, Pauwels and Bergier were

known among the avant-garde as reactionaries who supported French colonialism in Algeria; in 1960, Pauwels conducted a fawning TV interview with former Vichy war criminal and Paris police prefect Maurice Papon, who the next year would become responsible for the notorious Paris police massacre of Algerians (October 17, 1961). André Breton’s late surrealist group and the situationists rejected Pauwels and Bergier’s stance on colonialism as much as their mutational rhetoric, which can be regarded as a mystifying response to widespread concerns over the consequences of nuclear testing, and a potential nuclear war.<sup>39</sup> Mutants abound in 1950s and ‘60s culture, from B movies and comics such as *The Incredible Hulk* and *X-Men* to Leslie Fiedler’s notorious 1965 essay “The New Mutants,” which analyzes in mutational terms the changing habitus of young Americans in the age of counterculture and sexual revolution.<sup>40</sup> By the end of the decade, Henry Flynt’s 1969 manifesto “Overthrow the Human Race!” presents nuclear mutation as a pseudo-Nietzschean tool to overcome “man,” proposing to induce a thermonuclear war to cause mutations and thereby go beyond the human race.<sup>41</sup> The trope of course also plays a significant role in Japanese popular culture (*Godzilla*), and in the sculptures and installations of Tetsumi Kudo, who worked in Paris from 1962 on.

Mutation, strictly speaking, is a form of genetic recombination that effects individuals; through successful reproduction, such mutants can lead to new species or subspecies. Its proliferation in twentieth-century art and culture suggests that the aesthetic regime always bred speculations – but, then as now, such proposals have ambiguous and sometimes troubling overtones. With its speculations (often in the form of suggestive subheadings) on “The Mutants among us” and “An invisible society of Mutants?,” *The Morning of the Magicians*, like *Planète*, suggested such a mutational leap in progress. This revolution was linked, in obscure ways, to Nazism and its scientific experiments – Pauwels and Bergier liked to ruminate on concentration camps as experimental labs, and they often appear to intimate that the mutants among us are a secret sect of “cosmonazis.”<sup>42</sup> The motif was linked, in equally obscure and contradictory ways, to the advent of nuclear weapons at the end of the war. In the first issue of *Planète*, Oppenheimer was invoked repeatedly in the editorial, as was Teilhard’s eschatological interpretation of the “liberation of energy from the atom.” In the same issue, a piece by Robert Jungk more grimly noted the “poisoning of the atmosphere with radioactive isotopes” as a particularly dramatic manifestation of the

changes imposed by humans on their environment, the radiation presumably inducing mutations and thus inaugurating a next step in evolution.<sup>43</sup>

Jungk introduces a degree of seriousness and concern in the context of *Planète*; with *Brighter than a Thousand Suns* (German edition 1956, English translation 1958) he had published the classic account of the Manhattan Project.<sup>44</sup> The book became important in the context of the early Campaign for Nuclear Disarmament (CND) in the UK, founded in 1957. Jungk himself became active in the CND. More marginally, in 1958 André Breton penned an antinuclear manifesto in Paris, “*Demasquez les physiciens, videz les laboratoires*,” which was cosigned mostly by younger surrealists, and which attacked the “theology of the bomb” and science’s status as the new “Opium of the People.”<sup>45</sup> While the text exhorts the reader to support a Comité de Lutte Anti-Nucléaire, possibly modelled after the CND, this does not appear to have gained any traction. Nonetheless, this tract is a sign of things to come: the neo-avant-garde would go on to desubliminate the nuclear aesthetics of the postwar era. The surrealists responded to *The Morning of the Magicians* and *Planète* with several screeds, collected in the booklet *Les fausses cartes transparentes de Planète*, whose main authors, José Pierre and Robert Benayoun, were also cosignatories of Breton’s antinuclear tract.<sup>46</sup>

As for the situationists: in 1962, Guy Debord and Asger Jorn planned a journal titled *Mutant*, which never saw the light of day. In the announcement/manifesto, they lambast atomic shelters and “the new aristocracy of the caves.”<sup>47</sup> The proposed journal’s title is without doubt a dig at Pauwels and Bergier’s mutational rhetoric, an attempt to desubliminate their numinous intimations about a “Renaissance” through mutation and an evolutionary leap. For Debord and Jorn, the powers that be were speculating on a life reduced to survival, as embodied by the nuclear fallout shelter. These shelters, the situationists note, will obviously not offer real protection in the case of nuclear war, but protection was only a pretext used to integrate people ever more tightly into a social-economical order that depends on the renunciation of real desires and their channeling into artificial needs.

Survival as the opposite of life, if rarely voted for so clearly as by the buyers of shelters in 1961, can be found at all levels of the struggle against alienation. It is found in the old conception of art, which stressed survival through one’s works, an admission of a renunciation of life – art as excuse and consolation (principally since

the bourgeois era of aesthetics, that secular substitute for the religious otherworld).<sup>48</sup>

Art, then, had been a de facto fallout shelter of the bourgeois soul long before Hiroshima.

With the ecological movement gaining momentum towards the end of the 1960s, concerns over mutation increasingly also concerned other species – not just the (post-)human. In Holland, for instance, the Kabouter movement that emerged from the ashes of Provo in the late 1960s painted a grim picture of impending monstrous mutations. Protagonist Roel van Duijn argued that the mere collectivization of the means of production was insufficient; they needed to be *transformed*, beginning with energy: no nuclear energy, but high-tech windmills.<sup>49</sup> In 1971, van Duijn & co. rang the alarm bell over the production of nerve gas by Philips-Duphar in the sleepy Dutch town of Weesp, which – they feared – messed with the genetic makeup of the insects in the region. In a Kabouter publication, Hans Korteweg and Roel van Duijn referenced an anonymous Philips-Duphar employee who sketched a possible scenario for the near future:

“This means that most insects in the area are sterilized – and according to someone from the PR department, Philips-Duphar will use this as a selling point in its advertising – but what is hidden from the public is the fear that many insects will undergo mutations. Just imagine! Wasps with a diameter of 40 cm who will attack little children in the streets! Butterflies who will only feed on blood protoplasm!”<sup>50</sup>

Here, countercultural ecologists use provocative pulp horror imagery, seeking to marshal fears about humans falling prey to mutant insects. Ultimately, then, this scenario of animal mutation is highly anthropocentric. But what if we *are* the animals? In his *La Nucléarisation du monde*, Jaime Semprun hints at coming mutations that will make humans feel “like a fish in the water of Minimata [sic; a reference to bioaccumulated mercury in fish in Minamata Bay, causing mercury poisoning].”<sup>51</sup> Infra-sensible phenomena can result in very visible physical consequences – bodily symptoms indexing an intractable aesthetico-political problem.

## 5. Indexical Conceptualism

Starting in the 1960s and throughout his career, Sigmar Polke showed an interest in radiation. His library contains books from the period of when the German environmental movement and Green Party took off, such as the volume *Strahlung in*

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Robert Barry, *Radiation: installation Central Park*, 1969. Performance.



Ei Arakawa and the "Green Tea Gallery" (with Stefan Tcherepnin and Hanna Törnudd), *Yum Yum Vibe*, 2013. Performance at "Japan Syndrome – Amsterdam Version", Studium Generale of the Rietveld Academie, Amsterdam. Photo: Malthe Stigaard.

*Umwelt, Medizin und Technik* (Radiation in the Environment, Medicine and Technology; 1983), but also earlier literature that is more purely technical or historical in nature, ranging from an introduction to X-rays dating to 1930 via Hermann Rössler's *Atom-Lexikon* (1945) to Hellmut Droscha's *Kernreaktoren* (Nuclear Reactors; 1958) and Franz Kirchheimer's *Das Uran und seine Geschichte* (Uranium and Its History; 1963).<sup>52</sup> Uranium in particular held a fascination for Polke. His collection contains example of "Uranium Glass," items made from glass containing uranium, which are fluorescent under UV light). And from 1982 to 2000, he produced several series of *Uranografien*, or autoradiographs of uranium samples.<sup>53</sup> This is a link back to the early days of radiation enthusiasm.

When seen in conjunction with Polke paintings such as *Höhere Wesen befehlen: Rechte obere Ecke schwarz malen!* (Higher Beings Commanded: Paint the Upper-Right Corner Black!; 1969), with its implication that the abstract composition was determined by "higher beings" using the artist as medium, Polke's take on autoradiography also seems to revive the spiritualist and occultist overtones which the discovery of radioactivity had for Kandinsky – a theosophist with a firm belief in auras and "thought-forms." At the same time, Polke's *Uranografien* take their place in the mythology of Polke as "alchemist" handling and exposing himself (and perhaps also the viewers) to dangerous and toxic materials. The index of radiation here becomes a sign for the grandeur of the artist-magus. An autoradiograph made in a scientific setting in 1910, or at Bikini Atoll after Operation Crossroads, can have completely a different meaning than Polke's technically similar ones (even though Polke applied color filters to get more varied effects).

While there is a tendency to interpret indexicality in crudely causal terms, we have to acknowledge that the index only starts to signify when it is interpreted *as a sign*. When, in a discussion of the implications of quantum mechanics, Karen Barad (in tellingly "photographic" language) writes that "[images] or representations are not snapshots or depictions ... but rather condensations of multiple practices of engagement," this evokes both physical experiments (as in cloud chambers) and "conceptual experiments" in the form of quantum physicists' *Gedankenexperimente*.<sup>54</sup> In the context of quantum physics, Barad argues that the measured value is attributable neither to an independent object/reality nor to the act of measurement as such, and that the *referent* should not be thought of as an independent

object but as a phenomenon, with phenomena including "all relevant features of the experimental arrangement"; this can be taken as the point of departure for a general reconsideration of indexicality.

Barad can be seen as continuing Latour's critique of scientific objectivity as being "supposed to be *acheiropoiete*, that is *not* made by any human hand."<sup>55</sup> The index has often been cast as *acheiropoietic* sign, but again: insofar as it signifies, insofar as it *matters*, it is the product of interpretation as well as physical causality, and the feedback between the two. A watch that stopped running during the Hiroshima blast can be read as an index of that moment; a photograph of such a watch is a second-degree index that can enter into circuits of curatorial and critical practice. Video footage recorded by automated cameras in the Fukushima Daiichi nuclear power plant can become part of a video by Philippe Rouy, in which the disturbances in the image caused by radiation becomes not only evidence of contamination, but also a reflection on visibility and (a)visuality.<sup>56</sup> More dramatically, bodies exposed to radiation become indices through symptoms that emerge sooner or later. This is itself part of an "experimental arrangement" in which the risk of accidents is not avoided but managed in more or less successful ways; in which diagnosis and treatment may be subject to all kinds of economic and political constraints.

A number of artistic practices of the 1960s used the exhibition space as an experimental setup, the white cube as a camera lined with photographic paper or a cloud chamber in which, through aesthetic *Gedankenexperimente*, radiation could become sensate, sensible. Precisely because such practices took the modernist critique of representation to its limit, the zone of abstraction that is the white cube could become a radiation-sensitive device. The work of Yves Klein – Restany's mutant – contains explicit references to the advent of the nuclear age such as an "anthropométrie" titled *Hiroshima*, in which the blue imprints evoke the "atomic shadows" created by the bomb blast. However, Klein's white *vide* spaces, those absolutely purified white cubes, may constitute the next step, as is suggested by a Klein quotation that reads like a Cold War version of Kandinsky's much earlier statement: "One must – and this is not an exaggeration – keep in mind that we are living in the atomic age, where everything physical and material could disappear from one day to another, to be replaced by nothing but the ultimate abstraction imaginable."<sup>57</sup> With a well-known photo of Klein in the Krefeld *vide* suggesting that the even light there eliminates shadows, the *vides* can be



interpreted as zones in which all that is solid evaporates into energy; particles reveal themselves to be waves.<sup>58</sup>

Such a reading is strengthened by two pieces that resonate with Klein's *vides*. For his contribution to René Block's series of installations titled *Blockade '69*, Sigmar Polke turned an empty white gallery space into a podium in which he could "imagine that a particle (*ein Teilchen*) circulates around this space."<sup>59</sup> Here the white cube becomes a kind of zone of meditation in which a (presumably) subatomic particle outside the space is imagined. The reference to Klein is highly probable given the latter's prominence in the Rhineland in the 1960s (including a Klein *vide* at Haus Lange in Krefeld). However, a project by Stanley Brouwn from the subsequent year, which in turn appears to respond to Polke, moves the premise back to something closer to Klein's – but without the privileging of the artist as seer that Polke shares (albeit in a frequently ironic mode) with Klein. In Brouwn's piece, everybody can be a visionary. Brouwn's 1970 exhibition at the Museum Abteiberg in Mönchengladbach consisted of empty spaces with the instruction "gehen sie sehr bewusst durch die kosmischen strahlen in den museumsräumen" ("go very deliberately through the cosmic rays in the exhibition rooms"). Rather than using technology to reveal cosmic background radiation, Brouwn tries to create a kind of imaginary awareness of indexical affectedness through consciousness-raising. (Even so, the very notion of cosmic rays is of course dependent on a mass of psychical research, particular 1930s and '40s research with photographic plates that showed the tracks of particles that exploded due to cosmic rays.)

Some of Robert Barry's Conceptual pieces from this period do involve the presentation of photographic documentation in addition to texts, but the photos show up their limited range as conventional landscapes that Moholy would have rejected as reactionary. Barry's *0.5 Microcurie Radiation Installation* (January 1969) involved Barry burying a capsule containing barium 133, a stable isotope that would give off low-level non-harmful, non-ionizing radiation for ten years, in Central Park behind the Metropolitan Museum of Art. As shown in exhibitions, the piece comprises a text as well as black and white photos of (supposedly) the spot where the capsule was buried, but of course nothing "shows." Barry leaves the political implications of such opacity unstated. As in his work with radio transmitters, the focus is on invisible forces and invisible information rendered here though photos but ultimately mostly though language.<sup>60</sup> In contrast to Polke's autoradiographs with uranium, Barry's piece

seems to be about exploiting conventional photography for its poverty (even as the b/w prints are tonally rich), its blind spots.

To jump to the present: in her recent project *Pechblende* and related works, Susanne Kriemann has engaged with the nuclear-photographic archive, exhibiting historical autoradiographs produced by exposing marine creatures after Operation Crossroads in Bikini Atoll, as well as cloud chamber photographs and other archival images, in conjunction with her own autoradiographs of uranite/pechblende, exposing the material for different amounts of time (three days, seven days, ten days ...).<sup>61</sup> Kriemann also photographed and gathered plants from the terrain of a former East German uranium mine. Some of her photo prints show the plants in situ, printed in dye extracted from those very plants – dye that contains traces of toxic heavy metals, and potentially of radiation, even while fading over time.<sup>62</sup> This could be seen as a socialization and historicization of Polkean alchemy. Kriemann engages with and intervenes in the nuclear archive, taking snapshots of the ongoing process of planetary nuclearization. In contrast to conventional photography, of which Barthes said that "the duration of the transmission is insignificant," evoking Susan Sontag in claiming that "the photograph of the missing being ... will touch me like the delayed rays of a star," here duration matters a great deal.<sup>63</sup> Radiation is an index that keeps on shouting.

Compared to Barry's ten years of non-ionizing radiation, some recent works emphasize the staggering half-life of radioactive waste generated by the nuclear industry – and its disasters. Taryn Simon's *Black Square* at the Garage Museum in Moscow is, for the time being, an empty square depression in a concrete wall; Simon collaborated with Russia's State Atomic Energy Corporation to produce a vitrified piece of nuclear waste from Chernobyl. Vitrification converts radioactive waste from a volatile liquid to a stable solid mass, which resembles polished black glass. (In addition to the highly explicit reference to Malevich's *Black Square*, then, the piece could also be seen as referencing Matta's *vitreurs*.) The piece of glass will supposedly be installed in a void (alcove) at the museum in 3015. An artist "tirelessly pursuing the creation of monumental, 'critically' grounded images" for art-world patriarchs/validators, Simon, then, seems to bank on the continuous existence of a Moscow museum run by an oligarch's ex-partner.<sup>64</sup> This is a reversal of "nuclear semiotics" à la Thomas Sebeok, whose idea for an atomic priesthood presupposed a collapse of most social structures; in the new Dark Ages, this priesthood would warn the people of the

danger associated with certain nuclear sites.<sup>65</sup> With Simon, the new Dark Ages take the form of the perpetuation of the structures of an autocratic state and its resident kleptocracy. Malevich's zero of form, his quivering stand-in for the infinite, becomes a receptacle for an object that most of all seems to perpetuate and celebrate the opacity of the Russian art-industrial complex.

Meanwhile, in the context of the *Don't Follow the Wind* project, Trevor Paglen has installed his *Trinity Cube* in the Fukushima Exclusion Zone; this small minimalist cube combines an outer layer composed of irradiated broken glass from the zone with a core made of trinitite – the greenish glass that was created at Trinity Site in Nevada during the first atomic blast on July 16, 1945. The project description states that “the artwork will be viewable by the public when the Exclusion Zone opens again, anytime between 3 and 30,000 years from the present.”<sup>66</sup> On the one hand, even more than Simon, Paglen exploits the “mathematical sublime” of long time spans. Indeed, for all his critical pretensions, Paglen tends to fetishize sublime technology. Having recently launched a satellite as an artwork visible from earth, the artist is in the process of becoming today's Otto Piene or Heinz Mack (who were themselves almost comically oblivious of their projects' resonances with 1930s techno-sublime spectacles).

In the realm of theoretico-financial speculation, art's sensuous presence can itself be bracketed. As Stefan Heidenreich has noted, “[Graham] Harman's metaphysical conception of objecthood bears a striking resemblance to the requirements for things to be stored in a freeport,” that tax-exempt zone where artworks and other valuables are stored by the 0.1 percent.

Whether intentional or not, [Harman's] description of objects perfectly fits the artistic practices of freeportism: “The only way to do justice to objects is to consider that their reality is free of all relation, deeper than all reciprocity. The object is a dark crystal veiled in a private vacuum: irreducible to its own pieces, and equally irreducible to its outward relations with other things.” On other occasions he speaks of objects being “vacuum-sealed.” With well-packaged artworks coming so close to Harman's idea of the object, the freeport represents the ideal environment for object-oriented works of art.<sup>67</sup>

While Conceptualism made the object contingent, freeport art turns it into a deposit.

Pieces like *Black Square* and *Trinity Cube* are a sublime version of freeport art: the withdrawal of the object comes with a numinous frisson. They work in precisely the way they have been designed to: they represent a negative aesthetic of the techno-sublime. However, in the *Trinity Cube* text's rather grotesque oscillation between 3 and 30,000 years lies an acknowledgement of the vagaries of decontamination. Could the zone be declared safe(ish) sooner rather than later due to political and economic motives? Slow violence (to use Rob Nixon's term) affects people differently based on class, as well as ethnicity and other factors; could a vanguard of “expendables” be sent to or allowed to settle in the zone?<sup>68</sup>

Such questions drive home the point that nuclear indexicality is not a purely “natural” question reducible to the half-life of this or that isotope. The political economy of the nuclear has to be factored in. In *La Nucléarisation du monde*, Semprun's persona asks if the invisibility on which the nuclear regime depends is not the ultimate, “autonomous” manifestation of “this limitless social power that is the existence of commodified relations.”<sup>69</sup> If the commodity fetish depends on the concealment of labor, then does it not, in the nuclear age, also depend on a concealment of the dead, inorganic labor of nuclear power? If commodity fetishism depends, in Stewart Martin's words, on the “illusion of the commodity's sensuousness,” seeing through this illusion “does not dissolve it, since it is generated by the social relations of private labour.”<sup>70</sup> Indeed, just “making visible” in itself is clearly an insufficient strategy as long as a complicit investment in what is being “revealed” remains. This is the limit of all journalistic revelations about Facebook, Trump, climate change, or the nuclear-industrial complex – with the latter now being repositioned by some as “clean energy” in the half-hearted fight against climate change.

In their book *Catastrophism*, Jaime Semprun and René Riesel argue that

Günther Anders' theory of the “world-laboratory,” according to which the “laboratory” became co-extensive with the planet at the time of the first nuclear tests, has been positively recuperated, without any rebellious or critical intention whatsoever: as bland confirmation of our confinement in the *experimental protocol* of industrial society.<sup>71</sup>

To what extent are these experiments sensate? As Peter Galison has argued, modern physics was marked by a tension between an “image tradition” and a “logic tradition”: the former is

associated with cloud chambers and bubble chambers producing unique visual events and documentation, whereas the latter can be associated with the Geiger counter and its nonvisual registration of multiple events; the Geiger counter is not about individual clicks but about accumulation.<sup>72</sup> It's still an indexical device that registers particles, with ionization producing an electric charge rather than registering visually.

However, the logic tradition took a step beyond indexicality when, in Galison's account, its focus on statistics and probability took it into the realm of simulation: since the late 1940s, the development of nuclear weapons has been closely linked with digital computation. Los Alamos scientists used computers such as the ENIAC, the MANIAC, and IBM's SSEC. "Monte Carlo" simulations and other types were used to predict the behavior of particles and the chain reactions in (thermo)nuclear devices – a "new method for extracting information from physical measurements and equations."<sup>73</sup> The measuring of the world becomes its codification, its information. There is no linear, sub-Baudrillardian progression from "the real" to a "simulation" that marks the loss of this real; rather, these simulations – from late 1940s Monte Carlo calculations to the first three-dimensional VR simulation of a thermonuclear explosion at Los Alamos in 2001 – are always designed to feed back into reality.<sup>74</sup> This is an operative modeling of reality; the simulated explosion has real-world agency either when it is successfully implemented in the real world, producing physical indices, or through the logic of deterrence, as a spectral possibility, affecting minds. A big bang, then, as event horizon, infiltrating subjectivities as surreptitiously as radiation infiltrates people's lives and bodies – producing indexical effects when it's too late.

Art constitutes a museum of more or less gloriously failed tactics. In this museum, there are some projects that go beyond the standard critical unveiling of hidden wrongs in their performative making-sensible. In 2013, Ei Arakawa and the "Green Tea Gallery" (with Stefan Tcherepnin and Hanna Törnudd) made a contribution to the Studium Generale of the Rietveld Academie in Amsterdam that included an exercise in atomic cuisine: for *Yum Yum Vibe*, Arakawa & co. passed around a parcel containing radishes his mother had sent him from the Fukushima region, where she lives. Subsequently, Arakawa and his associates prepared soup from these vegetables. In 2014, Arakawa repeated the exercise together with his brother in the context of the Frieze Art Fair, now titled *Does This Soup Taste Ambivalent?* The imposition on the participants, who had to

decide for themselves whether they wanted to eat this ambivalent soup, made it clear that there is no outside. In the wake of a spectacular meltdown, subtle and accumulating effects are everywhere. We are mutants inside the world-laboratory. What we are waiting for is unclear to us.

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This text builds on the earlier article "Apocalypse (Not) Now" in the *Nordic Journal of Aesthetics* (2016), and on the seminar "Nuclear Aesthetics" I taught at the Vrije Universiteit in 2018, which will be the basis of an issue of the journal *Kunstlicht*.

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e-flux journal #96 — January 2019 Sven Lütticken  
Shattered Matter, Transformed Forms: Notes on Nuclear Aesthetics, Part 2



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e-flux journal #96 — January 2019 **Sven Lütticken**  
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- 1  
Wassily Kandinsky, "Rückblicke" (1913), in *Theories of Art 3: From the Impressionists to Kandinsky*, ed. Moshe Barasch (Routledge, 2000), 296.
- 2  
László Moholy-Nagy, *Moholy Malerei Film* (Albert Langen, 1927), 66–68, 70.
- 3  
Akira Mizuta Lippit, *Atomic Light (Shadow Optics)* (University of Minnesota Press, 2005), 30–60.
- 4  
Peter Galison, *Image & Logic: A Material Culture of Microphysics* (University of Chicago Press, 1997), 464.
- 5  
György Kepes, *The New Landscape in Art and Science* (Paul Theobald and Co., 1956), 200–203.
- 6  
Galison, *Image & Logic*, 65–141.
- 7  
Galison, *Image & Logic*, 143–60.
- 8  
Roland Barthes, *Camera Lucida: Reflections on Photography* (1980), trans. Richard Howard (Hill and Wang, 1981), 80.
- 9  
Tom Gunning, "What's the Point of an Index? or, Faking Photographs," in *Still Moving: Between Cinema and Photography*, eds. Karen Beckman and Jean Ma (Duke University Press, 2008), 26.
- 10  
"Das ist die Dialektik des Index: Er brüllt aus der Wirklichkeit, sagt aber erstmal nichts." Diedrich Diederichsen, *Körpertreffer: Zur Ästhetik der nachpopulären Künste* (Suhrkamp, 2017), 19.
- 11  
Carter Stone and Wolfgang Paalen, "During the Eclipse" in Wolfgang Paalen, *Form and Sense* (Problems of Contemporary Art, no. 1) (Wittenborn, 1945), 21.
- 12  
See Wolfgang Paalen, "The Dialectical Gospel," in *Dyn*, no. 2 (July–August 1942), 54–59. This issue also contains Paalen's famous "Inquiry on Dialectic Materialism," 49–54.
- 13  
Wolfgang Paalen, "Art and Science" (1942), in *Form and Sense*, 64.
- 14  
Wolfgang Paalen, "On the Meaning of Cubism Today" (1944), in *Form and Sense*, 30.
- 15  
Letter from Paalen to Gordon Onslow Ford, August 26, 1945, quoted in Annette Leddy, "The Painting Aesthetic of *Dyn*," in *Farewell to Surrealism. The Dyn*

*Circle in Mexico*, eds. Annette Leddy and Donna Conwell (Getty Research Institute, 2012), 33.

16  
As Andreas Neufert puts it in his biography of Paalen: "Paalen wiederum schlug sich mit Einwänden und Skrupeln gegen Matta herum, der von Hiroshima und Nagasaki einfach gestrickte Rückschlüsse auf seine Malerei ziehen wollte." Neufert, *Auf Liebe und Tod: Das Leben des Surrealisten Wolfgang Paalen* (Parthas, 2015), 527.

17  
Wolfgang Paalen, "Brief Outline," part of the unpublished typescript of *The Beam of the Balance* (1946). I am grateful to Andreas Neufert for making this script available to me.

18  
Barnett Newman, "The New Sense of Fate" (1948), in *Selected Writings and Interviews*, ed. John O'Neill (University of California Press, 1990), 165.

19  
Newman, "The New Sense of Fate," 169.

20  
Kurosawa's *I Live in Fear* (1955) is an example of a film that addresses the social and psychological fallout of the threat (and, for Japan, the memory) of nuclear war.

21  
Newman, "The New Sense of Fate," 169.

22  
See also Stephen Petersen, "Explosive Propositions: Artists React to the Atomic Age," in *Science in Context* 17, no. 4 (2004): 579–609.

23  
Günther Anders, "Tagebuch aus Hiroshima und Nagasaki" (1958), in *Hiroshima ist überall* (München, 1982), 64.

24  
"Dass diese verspätete offizielle Vorliebe für Zerstörung von Gegenstandsformen in der Kunst (bzw. die Propaganda für den Genuss an dieser Zerstörung und die Verhöhnung derer, die diesen Kunstfortschritt nicht mitmachen) mit der effektiven Zerstörung der Welt synchronisiert aufgetreten ist, war kein Zufall. Und ebenso wenig ist es ein Zufall, dass die Zerstörung der Welt, für die hier in Hiroshima die Generalprobe abgehalten wurde, ihr Monument in einem 'non-objective object' gefunden hat." Anders, "Tagebuch aus Hiroshima und Nagasaki," 65. Author's translation.

25  
On both movements, see Petersen, "Explosive Propositions."

26  
Beniamino Dal Fabbro,

"Definition of the Nuclearists" (1953), in *Arte Nucléaire*, ed. Tristan Sauvage (Arturo Schwarz) (Éditions Villa, 1962), 207.

27  
Asger Jorn, unpublished article quoted in Sauvage, *Arte Nucléaire*, 36.

28  
*Surrealist Intrusion in the Enchanters' Domain*, eds. André Breton and Marcel Duchamp (D'Arcy Galleries, 1960), 40–41; André Breton, "Enrico Baj" (1963), in *Le Surréalisme et la peinture* (Gallimard, 1965), 395–400. The comment on Baj's Lucretius illustrations (a portfolio of thirty-six prints published in 1958) is on 398.

29  
"Matta a toujours été attiré par les travaux des physiciens modernes sur la propagation des ondes et les radiations, et par les transformations gigantesques que les savants viennent de faire subir à la matière." Robert Tenger, "Note de l'éditeur," in Denis de Rougemont, *Lettres sur la bombe atomique* (Brentano's, 1946), 11. Translations from the French by Michael Andrews for my article "World History and Earth Art," *e-flux journal* 49 (November 2013), on which this discussion of de Rougemont is based <https://www.e-flux.com/journal/49/59999/world-history-an-earth-art/>.

30  
See last page of "On the Survival of Certain Myths and on Some Other Myths in Growth or Formation," in *First Papers of Surrealism*, eds. André Breton and Marcel Duchamp (Coordinating Council of French Relief Societies, 1942), unpaginated.

31  
André Breton, "Prolegomena to a Third Manifesto of Surrealism or Else (sic)" in *VVV* no. 1 (1942): 18–26. Matta selected preexisting images but also used one of his own drawings of Les Grands Transparents. On Breton, Matta, and the cultural context in which Les Grands Transparents emerged, with a focus on fantastic fiction and sci-fi, see also Gavin Parkinson, *Futures of Surrealism: Myth, Science Fiction and Fantastic Art in France 1966–1969* (Yale University Press, 2015), 19–36.

32  
Christian de Maussion, "Mythomattaque: Entretien avec Matta," *L'Autre journal* 9 (1986): 39.

33  
Louis Pauwels and Jacques Bergier, *Morning of the Magicians: Secret Societies, Conspiracies, and Vanished Civilizations* (1960), trans. Rollo Myers (Destiny Books, 2009), 393.

34  
Pauwels and Bergier, *Morning of the Magicians*, 393.

35  
*Planète* no. 1, undated (1961): quotations from 8, 131, 75.

36  
Pierre Guérin, "Hypothèses sur les mondes habités," *Planète* no. 1: 30, 32.

37  
Parkinson, *Futures of Surrealism*, 167.

38  
A blurb by Olivier Surel on the back cover of *The Quadruple Object of Philosophy*.

39  
*Internationale Situationniste* no. 7 (April 1962), which opened with an attack on nuclear bunkers and the "geopolitics of Hibernation," also contains a kind of attack ad about *Planète* (46), with the header "Si vous lisez 'Planète' à haute voix, vous sentirez mauvais de la bouche!" ("If you read *Planète* out loud, your mouth will hurt!"); further down, there's a reference to the mutation motif in the style of a Pauwels/Bergier subheading: "Et s'il le faut, mutons ensemble!" ("Let's mutate together if we must!")

40  
Leslie A. Fiedler, "The New Mutants," in *Partisan Review* 43, no. 4 (Fall 1965): 505–25.

41  
The Realists (Henry Flynt), "Overthrow the Human Race!," in *Happening & Fluxus*, ed. H. Sohm (Kölnischer Kunstverein 1970), unpaginated; see also Branden W. Joseph, *Beyond the Dream Syndicate: Tony Conrad and the Arts after Cage* (Zone Books, 2008), 210, 419 (note 135). Joseph notes that Flynt founded his "party," The Realists, in 1968, and dates the "Overthrow" manifesto as "ca. 1969."

42  
In the third issue of *Planète*, on 124, we encounter speculations on Nazis founding a secret order, "cosmonazism" (helpfully illustrated with a photo of a rocket), after the war, one that would allow them to subdue not just earth but other planets, employing more subtle methods than the crude means used the first time around.

43  
Robert Jungk, "L'Intelligence prend le pouvoir," in *Planète* no. 1: 15–17.

44  
Oddly enough, in a move that no doubt would have pleased Pauwels and Bergier, in one of the book's footnotes Jungk gives credence to the "Nazi UFO" myth still beloved by esoteric (and neofascist) conspiracy theorists. Robert Jungk, *Brighter than a Thousand Suns: A Personal History of the Atomic Scientists*

(1958), trans. James Cleugh (Harcourt, 1986), 87.

45  
As is evident from the title, Breton presents science as a lost cause altogether, rather than defending it against its instrumentalization, against its reduction to *Zweckvernunft*. This is a symptom of Breton's progressive withdrawal into esotericism. See André Breton, "Démasquez les physiciens, videz les laboratoires!" (1958) <http://www.andrebretton.fr/works/56600100719690>.

46  
José Pierre (et al.), *Les Fausses cartes transparentes de Planète*, published as *Le Petit Écrasons 3* (1965). See also Parkinson, *Futures of Surrealism*, 171.

47  
Guy Debord and Asger Jorn, "Mutant" ("European Critique of the Inadequate Program that has Just been Presented to President Kennedy and Governor Rockefeller by the Academic Staff of Universities, Colleges and Research Institutes for New York City and the Cambridge-Boston Area, with the Aim of Overthrowing the Absurd Procedures of 'Civil Defense' in the United States") (January 1962), in *Cosmonauts of the Future: Texts from the Situationist Movement in Scandinavia and Elsewhere*, eds. Mikkel Bolt Rasmussen and Jakob Jakobsen (Nebula/Autonomedia, 2015), 65.

48  
"Géopolitique de l'hibernation," in *Internationale Situationniste*, no. 7 (April 1962), 6; quoted from English translation by Ken Knabb, "Geopolitics of Hibernation," at <http://www.bopsecrets.org/SI/7.1.hibernation.htm>. This critical motif also plays an important role in Raoul Vaneigem's "Banalités de base," published in the same issue of *Internationale Situationniste*, which can be regarded as part of the SI's anti-*Planète* offensive (see note 39 above).

49  
Roel van Duijn, *Energieboekje: over de energie-krisis en de oplossing daarvan door een alternatieve technologie* (Bert Bakker, 1972).

50  
"Weesp testgebied voor Philips-Duphars Zenuwgassen," in *De Paniekzaaiër* no. 1 (November 1971): 6. Author's translation.

51  
Jaime Semprun, *La Nucléarisation du monde* (Éditions Gérard Lebovici, 1986), 14, 38. Author's translation.

52  
These volumes are represented in the artist's library as kept in the Sigmar Polke Archiv, Cologne.

53

Kathrin Rottmann, "Urangestein im Atelier," in *Alibis: Sigmar Polke 1963–2010*, ed. Kathy Halbreich (MoMA/Museum Ludwig/Prestel, 2015), 60–61.

54  
Karen Barad, *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* (Duke University Press, 2007), 53.

55  
Bruno Latour, "What Is Iconoclasm? Or Is There a World Beyond the Image Wars?," in *Iconoclasm: Beyond the Image Wars in Science, Religion, and Art*, eds. Bruno Latour and Peter Weibel (ZKM/MIT Press, 2002), 16.

56  
In his *Fukushima Trilogy* (2012–14), Rouy makes use of live cam and robot footage from the Fukushima plant.

57  
Yves Klein, quoted in Petersen, "Explosive Propositions," 599.

58  
As Petersen puts it, "*The Void*, in its emptiness and its use of strategic annihilation, also made metaphorical reference to the emptiness of nuclear obliteration" (599).

59  
One key difference is that Polke's piece was about a mental exercise by the artist ("Polke stellt sich vor, dass ein Teilchen diesen Raum umkreist"), whereas Brouwn's exhibition is an invitation to the viewer to experience walking through cosmic rays.

60  
On Barry, see also Eric C. H. de Bruyn's discussion of his use of a different kinds of "invisible waves" with his *Telepathic Piece* of the same year: de Bruyn, "Vanishing Acts: Notes on a Genealogy of Dematerialisation," in *DeMATERIALISATIONS in Art and Art-Historical Discourse in the Twentieth Century* (Proceedings of a conference held in Tomaszwice, Poland, on May 14–16, 2017), eds. Wojciech Batus and Magdalena Kunińska (2018).

61  
See Susanne Kriemann, *P(ech) B(lende): Library for Radiological Afterlife* (Spector Books, 2016). This book contains a version of Susan Schuppli's essay "Radical Contact Prints," which discusses the Bikini Atoll autoradiographs of fish (133).

62  
See *Supplement – 2: Exclusion Zones* (Fillip, 2017), a booklet with text by Eva Wilson and images by Kriemann.

63  
Barthes, *Camera Lucida*, 80–81.

64  
For a general critical assessment of Simon's work,

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