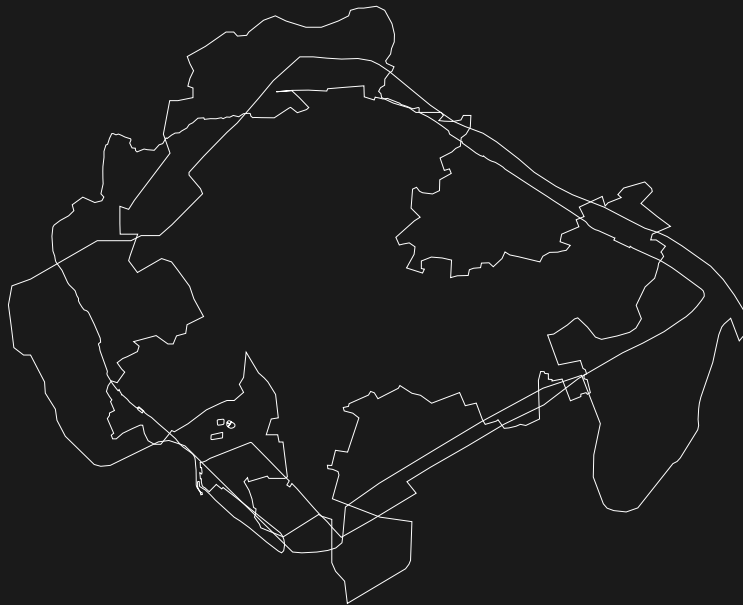# TERRA FORMA

Marcello Carpino
EXPLORE LAB 30 — TU Delft

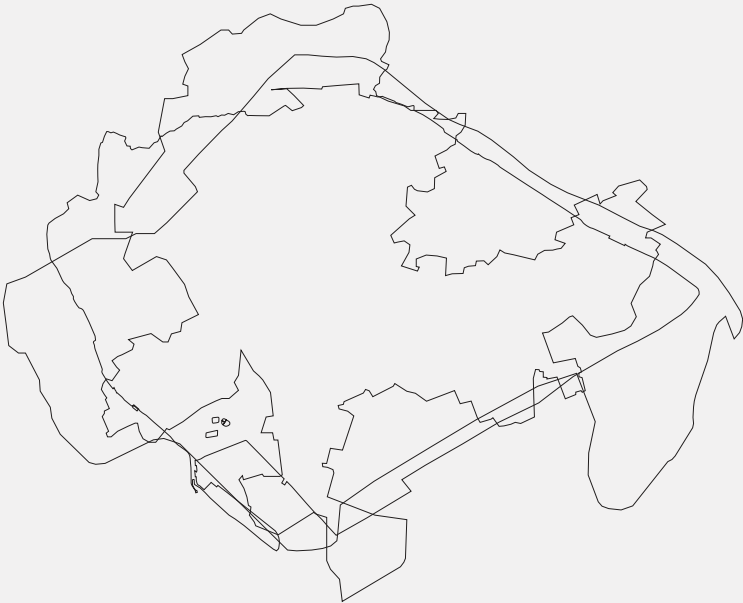Marcello Carpino

Explore Lab 30
2020/2021

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Building Technology Mentor. Jan Van Der Voort

IV

Desire is part of the Infrastructure.
Gilles Deleuze

Introduction.

The Anthropocene began to coat our daily existence with a feeling of estrangement. The objects, build-ings and cities that surround us lost their credibility, being potential vehicles of innocent and molecular behaviours that, once multiplied, can become molar compounds of very dangerous effects. Much of the contemporary cultural struggle could be seen in the light of finding a posture towards this suspicious sentiment. Our current fixation for 'future-proofness' drives an emerging interest in a building's life cycle, carbon footprints, material passports that pushes our perception of the forms that surround us beyond their immanent presence. All of these practices, beyond the pragmatic needs that have produced them, mani-fest the will to expand the agency of design towards the past and the future.

Among these, the pressure of a possible climatic failure has pushed the field of design towards the expansion of human culture either towards other planets - terra-forming - either techno-fixing Earth - geoengineering. Although both terraforming and geoengineering are often propagandised as novelty, these represent the apex of an implicit and often unaware anthropic activity on Earth that, over the course of millenia, has already transformed its configuration and that, through these new technological improvements, could reach an unprecedented scale.

For example, the Benedictines, in the 10th and 11th centuries, transformed the Po River plain from a swamp to a tillable and highly productive land through drainage systems. The Cistercians developed fish-eries and vineyards between France and Switzer-

land by forming terraces on extremely high slopes. In modern times, during the 16th century, Venice, due to the decay of trades with the East, attempted to convert its economy from maritime commerce to agriculture. The operation involved profound changes in the type of plants being grown, the methods used for exploiting terraferma with consequences in the social and political structure of Venice. As these examples show, the anthropic environment is the result of the continuous appropriation of the available material conditions that become extracted and abstracted.

Out of the chaoticity of the Earth, environments are crafted and signified through models that guide practices, habits, gestures, thoughts, sense and sensation. In fact, these operations inscribe the development of models - from cartography to mathematics - that have allowed the cognitive comprehension - understanding and, in its etymology, possession - of a territory and the possibility of transforming it into both an answer to a culture's pragmatic necessities and an embodiment of life expectations. The model - as a diorama of the real - tends to substitute itself with reality and, thus, it becomes a sort of demiurgic instrument: ubiquitous and perfect, a map is vertical as its viewpoint, containing and seeing everything. At the same time, a model is a κρίσις[1] - both an understanding and a filter: fixing parameters imposing itself on the world, it operates an inevitable reduction.

1. The indoeuropean origin of crisis, *'kr'* used to indicate the sieve used to separate a matter from its impurities.

With the Anthropocene, a cesure has emerged between the real as the result of representations - what we choose to sense, perceive, understand - and the world as it is. As the whole of Earth has become a computable model, anthropic life began to : this event registers the fallacies and the leakages between the once presumed harmony between anthropic time and the "deep time"[2] of the Earth. In fact - as sociologist and architect Benjamin Bratton has written - the
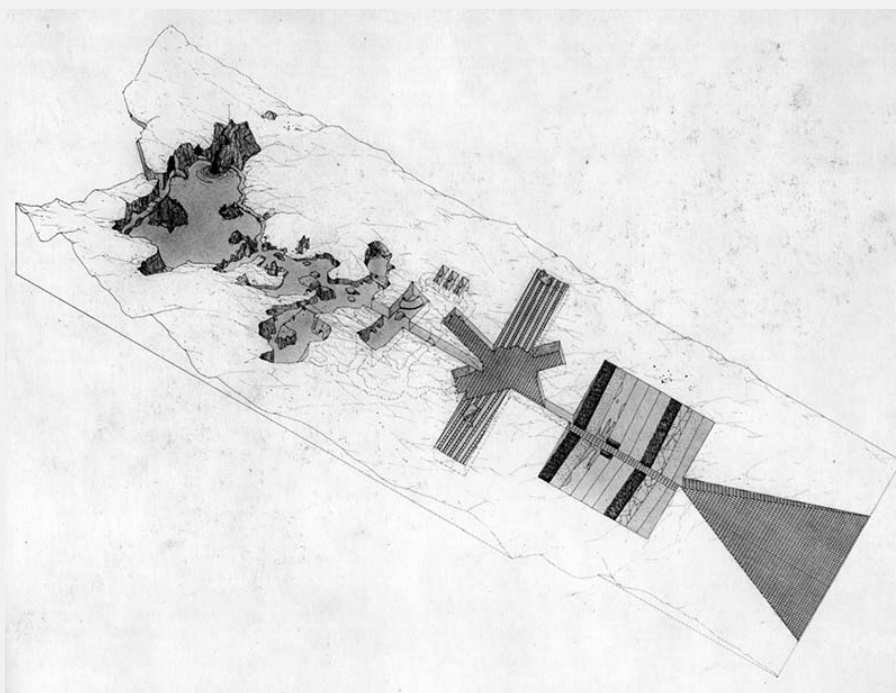
Extraction/Abstraction.

left. Hans Dieter Schaal, Path going from a clinical and technical environment to a romantic environment, 1982.
right. Unknown, La Città Ideale, 1480/Charles Lyell, Soil stratigraphy, 1850; drawing by author.

divide between nature and culture 'provided a flexible alibi with which to elevate human culture from geologic and biologic strata into a realm of self-accountable expressivity'.[3] In fact, as the media theorist Jussi Parikka has noticed, the discipline of geology – which started to gain ground between the 18th and the 19th century - became one of the main disciplines of planetary inquiry, leaving the domain of morals to what happened "on top".[4] Instead, following Parikka, the Anthropocene forces us to acknowledge the entanglements between the field of morals and the one of geology.

2. Jussi Parikka, A Geology of Media, 2015.

3. Benjamin H. Bratton, The Terraforming, 2019.

4. Parikka.

○

The ambition of the thesis is to acknowledge a notion of "territory" as the co-existent and co-evolutive stratification of mental, social and physical territories, investigating how this entanglement unfolds as a process of constant becoming. The field of investigation is Rhineland, a territory between Cologne and Aachen that has hosted and hosts numerous coal and lignite mines. Within the European context, Rhineland manifests conflictual and dialectical relationships drawn upon a territory transformed from a constellation of rural villages around a Common Forest into a territorial machine shaped by the rhythms of the lignite extraction.

While ecologists' movements occupy the remaining forests, the voracious expansion of the mining operations has led to a continuous displacement of many villages - then rebuilt in generic and prefab modules at the minimum cost - while the "abandoned" towns have been re-populated by migrants. As the coal phase-out is approaching in 2030, the many proposals for the redevelopment of the region can be read as a collection of ideologies - techno-fix, nostalgic, tech-

no-romantic - which all fail to account for the multiple and diverse conditions of the site: a floating solar park, an artificial yet idyllic lake, a void kept as-it-is as a perverse touristic attraction.

Instead, the thesis investigates how to mediate a relationship with the very site of those conflicts: the soil. Thus, the site and its soil are intended as the field for thought and action where to operate an abstract geology of modernity: in this sense, 'geology is the science which investigates the successive changes that have taken place in the organic and the inorganic kingdoms of nature; it enquires into the causes of these changes, and the influence which they have exerted in modifying the surface and external structure of the planet.' In conclusion, this work wants to be an occasion to reflect on and question the implicit power of architecture as a media between geology and 'morals' as a possible field of agency as an architect.

Terra

Rhineland

Rhineland. drawing by author.

5 Km

The Machine.

Some territories in Europe are recognised for their natural characteristics, others for being a productive, infrastructural or economical apparatus that through anthropic sedimentations have produced a distinct and recognizable landscape. Many of these are a relatively recent phenomenon: regions that within the last hundred years have been exploited for energy generation and which, as such, have performed as the background of modernity. Territories like these have been, in fact, the energetic reservoirs that sustained the voracious needs of the city while becoming, at the same time, laboratories for the new forms of life that modernity had created: places in which new relations with mechanization, nature and labour could be tested and perfectioned.

Between Cologne and Aachen, the territory of Rhineland shares this definition. Since the industrial revolution, its soil - rich in lignite - has attracted the mining industry which has produced the fragmented patchwork of open-pit mines that characterize the region today. In Rheinland, the fast pace of industrialisation has come to terms with the deep time of its geological history. Its proximity to the Rhine - which splits Cologne in two - have contributed to the series of faults, sedimentations and other geological processes that over the course of millenia have provided it with its carboniferous characteristics: on one hand, its lignite stocks stored deep underground;

on the other, its fertility which covered its surface with oak forests. The biggest of these became - as it will be explained later - a common forest and acquired a strong collective and political connotation until the arrival of the excavators.

Today Rhineland accounts for three active open pit mines: Garzweiler, Inden and Hambach. These extract annually 100 millions tons of lignite, about a third of the total carbon dioxide emissions in Germany.[1] The scale of Hambach, Inden and Garzweiler is in direct confrontation with the four-lanes highways that connect the major urban centers surrounding this landscape. These infrastructures often sideline or cross the surface of the mines: the three holes, their giant machines and mastodonic depths are an involuntary spectacle for the highway's passengers. While before the Fifties the excavations were led by human workforce, from the Sixties on these have been progressively replaced by giant bucket wheel excavators - Bagger 293 and 288.[2] The change has visually imprinted itself on the shape of the excavations, as their gritted and sharp blades have determined the specific conformation and patterns of the excavation steps.

Among the aforementioned three, the Hambach Tagebau accounts as the largest open pit mine in Germany, and the largest man-made hole in Europe. It spans for about eleven square kilometers and at 295 meters below marks the deepest artificial depression in Germany. The amount of lignite that it offers has represented a fundamental asset for the production of electrical energy in the whole Germany.

1   Andrea Brock, 'Securing Accumulation by Restoration – Exploring Spectacular Corporate Conservation, Coal Mining and Biodiversity Compensation in the German Rhineland,' Environment and Planning: Nature and Space, May 22, 2020, https://doi.org/10.1177/2514848620924597.

2   wisoveg.de, accessed February 2020

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Over the course of thirty years, the mine has kept expanding, devouring more and more the oaks that constituted the forests. The next, and the last, expansion will take place within the next fifteen years: here, only one small portion of one of the original forests is still intact, although it might - and probably will - be devoured within 2030.[3]

Rheinland has been one among many territories in Europe that has undergone a complete restructuring with the advent of the Industrial Revolution. At the time that industrialisation reached it, the forest lost its - at the time sacred - value and left space for the first mining operations in the area. Soon hereafter, the agricultural villages absorbed the speed and energy of the new machines and technologies that appeared in the region, and were transformed into towns where most of the population was composed by the workers of either the mines or the power plants. The villages changed, not only in their structure but also on the different temporalities the new lifestyle gave rise to. From being a rather disorganised and informal settlements whose muddy paths were in a continuous relationship with the agricultural fields, industrialisation became crystallized in a myriad of urban infrastructures: from car lanes, sidewalks and private gardens to schools and post-work clubs.

The new work-shifts and machines populated the town by a new kind of man, the *Verdoppelt Mensch* - re-doubled man -

that, in the words of the Cologne postwar architect Rudolf Schwarz, was doubled between life and work, urban and rural, social and natural.[4] Rhineland mirrored the paradigm of the *machine*, an open air factory at territorial scale: the elements that constituted this territory abandoned their 'magical unity' to become parts in specific functional relations to each other.[5] Therefore, the introduction of new technological paradigms did not only mark a difference in the economy of the region but deeply affected its social structures and, in general, relied on a different conception of the land: the ground was transformed from an external given to a fully controlled surface, object of conception and construction.[6]

In order to expand on this point, a productive comparison to this shift in Rhineland can be found in the infrastructuralisation of the American landscape by the Europeans at the beginnings of the 18th century: a virgin land transformed into an abstract surface for exploitation. David Nye has written about the narrations that took place in the formation of the American landscape and underlined how 'the persistent desire to assimilate nature to a second technological creation was the central feature of technological foundation stories'.[7] The industrial mill, a technology that started spreading from the 19th century, appears as a foundational myth in the appropriation of the - by then - virgin american landscapes. Quite curiously this is common genealogy in foundational myths, as in the case of Rome

3   Andrea Brock and Alexander Dunlap, 'Normalising Corporate Counterinsurgency: Engineering Consent, Managing Resistance and Greening Destruction around the Hambach Coal Mine and Beyond,' Political Geography 62 (January 2018): 33–47, https://doi.org/10.1016/j.polgeo.2017.09.018.

4   Panos Mantziaras, 'Rudolf Schwarz And The Concept Of 'City-Landscape'.

5   Gilbert Simondon, 'The Genesis of Technicity,' in eflux, 2017.

6   Milica Topalovic, 'Land Construction', in ARCH+, The Property Issue: Politics of Space and Data, Birkhauser, 2020.

7   David E. Nye, America as Second Creation: Technology and Narratives of New Beginnings (Cambridge, Mass.: MIT Press, 2003).
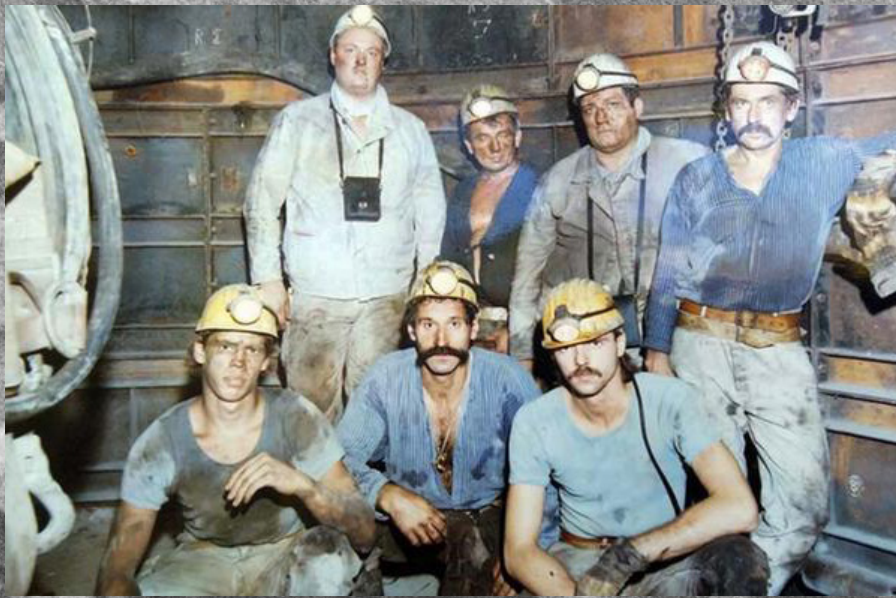
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Background of Modernity.

left: Michelangelo Antonioni, Gente Del Po, 1947
right: Jacques Tati, Playtime, 1968

or Tebe, where the technological seems always to be the necessary medium through which the original delimitation can take place.

The technological shaped the social and the social 'shaped' the technological: through these narrations the Americans were able to semanticise and *comprehend* - in the latin meaning of the term, of possession - the recently discovered american territory. Through mills, irrigation systems and later transportation and communication networks as railroads and telegraphs, a *new nature* was being invented. In fact, it was a period of extreme optimism in the possibilities of men's terraforming of America: 'the river had been created not for the picturesque but for the useful' was a common motto.[8] This sort of hubris towards a productive nature propelled the ambition of harnessing power that could be perpetual, endless and non-entropic, as the following extract from the poet and philosopher Ralph Waldo Emerson manifests:

'Power is what (men of sense) want, not candy, power to execute their design, power to give legs and feet, form and actuality to their thought'[9]

In this midst of these excitements and illusions, the figure of John A. Eztler stands out for his positivist attitude and kind of symptomatic - although exaggerated even to his contemporaries - positions. John A. Eztler was a technological utopist

at the time famous for his 1833 volume 'The Paradise within the Reach of all Men' in which he argued that his contemporary technologies could harness infinite energy in order to produce perpetual and non-dissipative power.[10] During his career, he even managed to get numerous funding for his publications and studies. He accompanied his work with an intense production of lunatic patents - criticized by his contemporaries Thoreau and Emerson himself - among which 'The Satellite', 'a general-purpose cultivation tool that was to be propelled using ropes to transmit power from a stationary source that was powered by wind'. [11] Eztler's visions, in the kind of freudian delirium of human conquest in which they are immersed, are peculiar as they embody a romantic attitude towards 'progress' yet coupled with a very pragmatic, almost logistical attention in transforming the natural givens into a productive reservoir.

As architect and researcher Milica Topalovic has pointed out, in this period the perception of land was oscillating between Romanticism and Positivism: 'between Nature as a subject towards which to find a relationship, and Nature as an object available to humanity for industrial exploitation and extraction of profit'.[12] Leo Marx observed in the spatial ideologies of modernity the resolution of a dialectical and contradictory character between these two conceptions of nature, that consequently has produced new kinds of hybrids.[13]

8   Nye.

9   Nye.

10   Nye.

11   Nye.

12   Milica Topalovic, 'Land Construction', in ARCH+, The Property Issue: Politics of Space and Data, Birkhauser, 2020.

13   Leo Marx, The Machine in the Garden: Technology and the Pastoral Ideal in America (New York: Oxford University Press, 2000).

'*The free economic competition and technological progress are valued equally with the tradition of landscape pastoralism; thus, in our landscape the machine is accommodated in the garden.*'[14]

As of today, we can say that the machine has become indistinguishable from the garden, as much the garden is indistinguishable from the machine. In fact, when approaching it by car, this landscape unapologetically juxtaposes a repository of conflicting clues: polygonal fragments of ancient forests are interrupted by freshly built suburban developments, old towns seem abandoned or are in the process of being demolished, giant but pure and geometrically shaped chimneys contrast the general flatness of the landscape and become a mean of orientation, when - suddenly - the highway crosses one of its quarries of unbearable dimensions, so big that it might seem to have been teleported elsewhere.

Far beyond the three mines that are currently visible today, a number of other sites have hidden the traces of past open pits that have excavated, exploited and exhausted the reserves of coal and lignite. Rheinland's topography is in fact the result, for big parts, of this terraforming: its bulgy mounds and hills are none other than the displacement of past excavations' debris and subsequent recultivation. On the verge of becoming a ruin of our carbon modernity, Rheinland makes no distinction between natural and artificial, fake and authentic.[15] On one hand, the re-cultivated - 'fake'? - land mixes without clear boundaries with the natural and highly biodiverse - 'authentic'? - one, giving birth to hybrids. At the same time, the anthropogenic open pit mines have become fully part of its physical and cultural landscape: they have acquired the status of sublime wonders and every year attract numerous tourists that graze at their uncanniness or take guided tours on the lignite extraction process.[16] *Der Hambach Tagebau*[17] has been a physical and metaphorical tabula rasa: as the mining operations proceeded, they sweeped not only the greenery and its biodiversity but the political and administrative regime that the Common Forest had created, its - as we will acknowledge soon - sacred perception and ultimately, the *Mensch* that supported it.
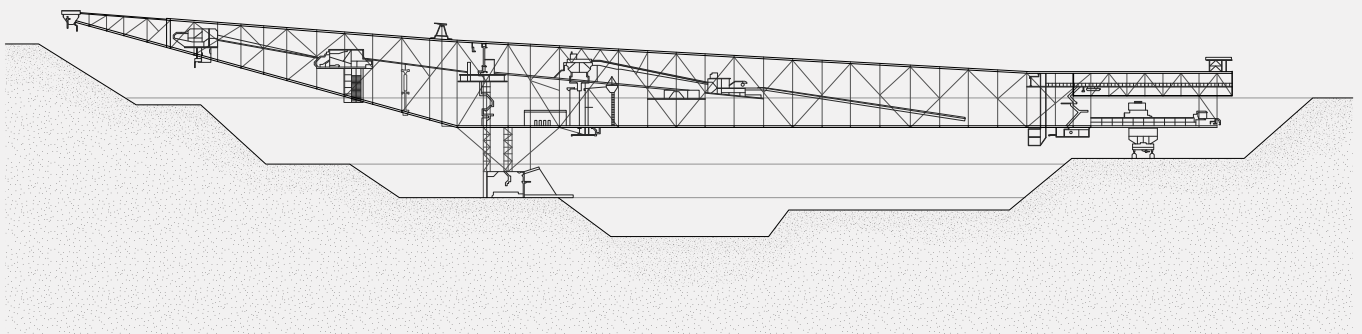
14   Marx.

15   Brock and Dunlap, 'Normalising Corporate Counterinsurgency.'

16   Brock, 'Securing Accumulation by Restoration – Exploring Spectacular Corporate Conservation, Coal Mining and Biodiversity Compensation in the German Rhineland.'

17   German for open pit mine.

TAKRAF Bagger 293. Drawing by Author

The Garden.

The area of the Forest exceeded what is today known as the Hambach mine, as it originally occupied more than forty square kilometers, stretching between Elsdorf and Niederzier. The first written records that witness the presence of the Forest date back to the eighth century and it attests that it belonged to Charlemagne as royal property.[18] The history of the forest overlaps the hagiography of an individual at the court of Charlesmagne that is still worshipped as Saint and protector in the more than 50 villages of the area. Arnold Von Arnoldsweiler was a member of the court of Karl who - once he learned that the villagers of the area were not granted access to the Forest, tricked the king to transfer to him the property of it.

As the popular narrations tell, on occasion of the St.Hubert hunt, Arnold accompanied Charlemagne near his estate in Duren. Here, Karl and his entourage challenged him: he would be granted the concession of the Forest if he was able to go its whole length on a horse during the short timespan of a lunch. As he successfully managed, Arnold decided to donate his newly gained property directly to the villagers. From this mythical event on the Forest gained the name of *Burgewald*, translatable as 'guaranteed forest', more commonly known as *Die Burge*.[19]

Beyond this myth, Die Burge used to entail a shared ownership among the numerous surrounding villages, which took the responsability of protecting and maintaining it. It hosted different public activities, among which the pilgrimage in honour to its protector Arnold. The Forest and its common ownership were based on a set of unwritten rules shared by all the communities involved. In example, it was allowed for the villagers to graze their pastures and harvest its products, while no one could tear down a single tree or make use of the forest for personal profit. This is peculiar if considering that it was a period in which all the other surrounding forests were being torn down and transformed into agricultural land: it was, in fact, the sacred status of which the Burgewald was charged that protected its oak trees from destruction.

After the Middle Ages, the transformation from informal settlements to municipalities complicated the juridical status of the Forest, while maintaining its shared property form. In 1562, a new formal law, the *Bürgebuschordnung*, divided the forest into four quarters - Arnoldsweiler, Steinstraßer, Elsdorfer and Manheimer - which made the use and distribution of the forest more formally defined according to the newly established municipalities. Later, in 1775, the quarters were subdivided even more according to the communities and villages that were located close to them. These took the name of the respective village followed by '-*burge*', as the Forest became an extension of each village and the point of contact among the different communities.

Periodically, the members of the different communities organized the so-called *Holzgerlingen*: these were meetings among the representatives of all communities in which the use of the Forest was

18   https://hambachforest.org/
19   https://hambachforest.org/
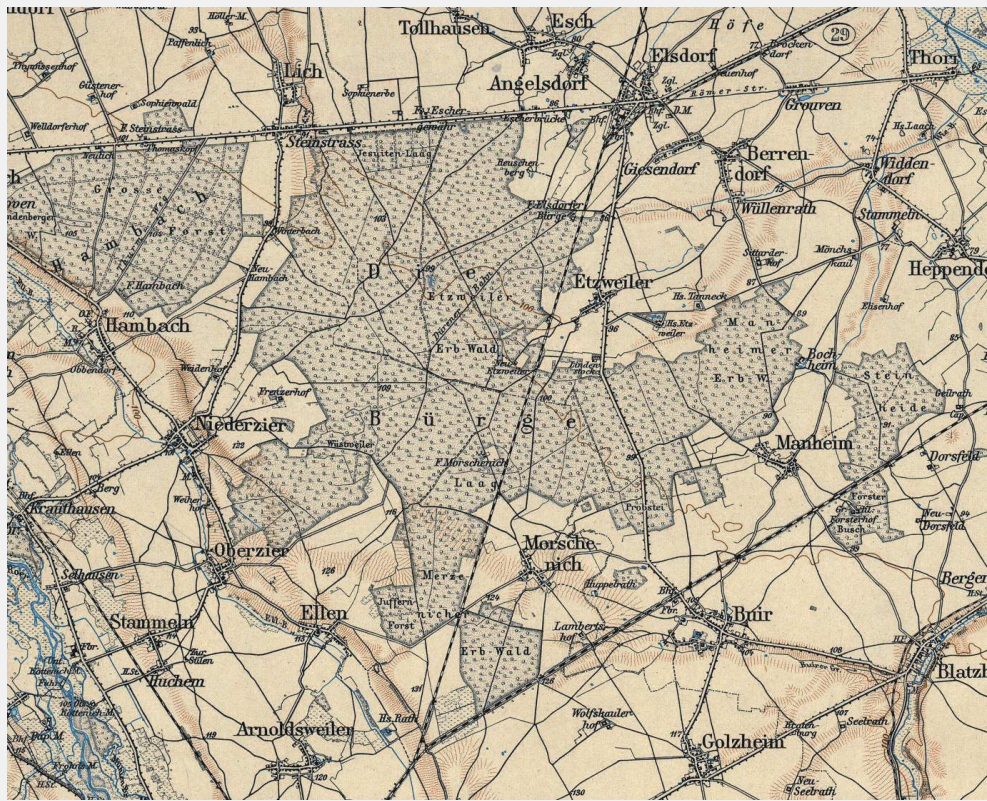
Map of *Die Burge* - The Common Forest, 1750

planned and where it was decided on how to maintain it for the upcoming season. Therefore, within this new framework, the Forest, that once was informally supported by its sacred connotation, now became a concrete administrative entity with a set of established rules: with time, it enmeshed with the life in the villages, influencing their social and political milieus in a similar way to what industrialization will do some centuries later.

In a sense, the Forest formed with the villages a relationship analogous to a courtyard with the buildings that surround it. In fact, the life within the villages was split between productive endeavours - in the agricultural fields towards the outside - and the collective realm of the Forest towards the inside. The invisible enclosure around the Forest that such configuration created, provided it with not only sacred but with - as we saw - political connotations as well. In this sense, the collective status of Die Burge recalls certain ideas concerning the garden as a spatial form, as explained by the architect Piervittorio Aureli. Gardens are not here intended as only the space adjoining the house but they can be intended as the act of 'domesticating forests, building boundaries, enclosing spaces''.[20] Therefore, gardening can be abstracted as a form of collective mediation between different actors. On one hand the history of gardens is the building of different relationships between human and natural - anthropic and entropic. On the other, gardens have always represented the embodiment of a collective reality. As Aureli has explained: 'the garden symbolizes, allegorizes and often sublimates power conditions that define the territory at large within the microcosm of a finite form'.[21] Gardening

can be compared to architecture as both share a collective endeavour: however, it has to be noticed how both do so entailing very different planes of performativity.

The act of gardening as a spatial activity blurs the distinction between what usually constitutes architecture: the moment of design and the one of construction.[22] Instead, the practice of gardening can be seen as the establishment of periodic, diluted in time, rituals of care and for this reason it represents an institution of collective life. Analogously, the common Forest fostered the need for its maintenance and preservation among the villages that surrounded it: a collective-enabling and -enabled space that counterpointed the productive activities that took place in the agricultural fields. At that time in Germany, many of these had been obtained from the clearing of forests and marshlands, which had been traditionally domesticated by the myriad of teutonic communities who were self sustaining them through foraging and harvesting roots, tubers and other products. The grain-cultivated fields, instead, were given to the villagers as a concession from the ruler, which imposed a tax upon them.

The transition from forests to agricultural land, and consequently from the act of foraging to the one of ploughing, registered a societal transformation: the physical terraforming converged into other cultural and political forms. In fact, according to the political scientist and anthropologist James C. Scott the appearance of institutionalised power, the state, is not a product of sedentary agriculture, but the opposite: sedentarism and agriculture were produced by the

20   Piervittorio Aureli, 'A Concise History of Gardens,' ACCATTONE no. 6.

21   Aureli.

22   Aureli.

State through institutional imposition.[23] As Scott demonstrates, grains were 'best suited to concentrated production, tax assessment, appropriation, cadastral surveys, storage rationing', while roots and tubers 'failed' this process of selection for their poor visibility, accountability and accumulation.[24] In fact, historical documentation shows how the agricultural lifestyle was much more burdening and unproductive than the practices of self-sufficiency as foraging, and it managed to affirm itself only through the coercition of institutionalised power. Thus, the agricultural fields and their taxation indexed the land as a 'political technology'[25]: the territory became a measurable entity, the precondition for the imposition of a legal and bureaucratic apparatus.

Indeed, the geographer Stuart Elden notices how Messen - to measure or gauge - is directly related to Masse - the mass or the group. He has consequently affirmed, in consonance with Scott, how measurability constitutes the precondition for an institutionalised territory:

'Territory comprises techniques for measuring land and controlling terrain. Measure and control—the technical and the legal— need to be thought alongside land and terrain.'[26]

Therefore, these sort of 'agri-logistics'[27] related the individual directly to its amount of taxable land and through so, to the state. Die Burge, responding to the archetype of the garden, forged a relational field beyond the paradigms of containment, control and measuralibity that - as it has been seen - characterized the rest of the land and will characterize the transition from agriculture to mining with the advent of industrialization. Confronted with these conditions, Die Burge represented its radical opposition, as it established a civic milieu for active confrontation on a collective level.

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23   James C. Scott, Against the Grain: A Deep History of the Earliest States, Yale Agrarian Studies (New Haven: Yale University Press, 2017).

24   Scott.

25   Stuart Elden, The Birth of Territory (London: The University of Chicago Press, 2013).

26   Elden.

27   Timothy Morton, Dark Ecology: For a Logic of Future Coexistence, Wellek Library Lectures in Critical Theory (New York: Columbia University Press, 2016).

left: early mining in medieval Germany.
right: *Bergregal* - Concession of Mining rights by the sovereign.

The Company.

Rheinland shares an analogous situation with a number of other territorial machines devoted to coal extraction that are scattered around Europe. From Rheinland to Lusatia, Saarland and Silesia, all these industrial territories and their related economy have been the reason for the establishment of the European Coal and Steel Community, ECSC, the antecedent of the current European Union. It was first proposed by the french Minister of Foreign Affairs Robert Schumann on occasion of the famous Schuman Declaration on 9 May 1950, which is still viewed as one of the main founding events of the EU. The ECSC was politically aimed at pacifying the relations between France and Germany after World War II by creating a single market for the industries that mainly drove economic growth. In doing so, Schumann would neutralise competition between European Nations over natural resources, so that 'it will make it plain that any war between France and Germany becomes not merely unthinkable, but materially impossible'.[28]

Both coal and steel, of which the Franco-German border is rich, represented a fundamental asset for the two World Wars and the industries to these related became not only driven by economic goals but by identitarian matters as well: their relevance entailed in fact the entire country, and as such these territories have performed as the energetic reservoir for the country's ambitions. The author

Elias Canetti, in Mass and Power, has suggested how the German population had historically found compactness in the archetype of the Forest. The oak trees, that populate its numerous forests, have served as an analogy for the Volk and for the army in occasion of warfare: the rigidity of their cortexes and the rhythmic punctuation of their trunks transmuted into virtues that individuated both the individual soldier and the troop.[29] With industrialisation, the appearance of large scale companies required an organized workforce that translated this identification from the forest to the machine.

In fact, for the large scale of the operations conducted, all these energy landscapes show a big concentration of power in one single company, that usually holds the monopoly in energy generation in its respective country. The mining operator company, RWE - at the time of the acquisition of the site known as Rheinbraun - is the leading electricity provider in Germany and historically had the monopoly over Western Germany electricity grid. The richness in lignite attracted this company in order to feed the numerous power plants that surround the villages and towards which the lignite is directly moved following coal-tracks.[30] The municipalities and privates which were sharing the ownership of the forest started to sell their properties to Rheinbraun AG between 1967 and 1971, *de facto* losing any right of use while yet having ties with the company - either as shareholders, as municipalities or community associations, either as employees in the soon-to-be created jobs.[31]

28   Robert Schuman during 'The Schuman Declaration – 9 May 1950,', European Union, June 16, 2016, https://europa.eu/european-union/about-eu/symbols/europe-day/schuman-declaration_en.

29   Elias Canetti, Massa e Potere (Milano: Bompiani, 1990).

30   Werner Sieper, 'Problems of the Bürgewald,' Dürener Geschichtsblätter, no. 26 (1960).

31   Sieper.

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As in all these other regions, RWE is not just a private company operating in the field of electricity, but its ties with the local population and municipalities have solidified and entrenched over the course of a hundred years of mining activity in the territory. In the 70s, the municipalities had 60% of shareholders voting rights in the decisions made by the company; today, still 32 municipalities over 50 can be accounted as shareholders. Local authorities are not only RWE's clients, but employees as well: 'refusal to license operations or grant permits would thus negatively impact municipalities' ability to finance their budgets'.[32] These unique mutual dependencies have legitimised the company operations within Rheinland, blending private interests with public ones, economy and politics. 'What is good for RWE, is good for the public' affirmed its CEO in 2011, although the company's emissions cause a large number of deaths and RWE is today the largest CO_2 emitter of Europe.[33]

These mutual interests have developed beyond public-private partnership and created numerous cases of conflicts of interests, lobbying and corruption. As a matter of fact, RWE's political influence transgresses the scale of the municipalities of Rheinland and extends until the national one: its lobbying activity has been considered noteworthy in a favourable management of Germany's coal phase-out agreements.[34] Within the borders of the region, RWE has adopted strategies that have extended its zone of influence far beyond the limits of the mining sites: this metaphor is not only spatial as through this series of acts

RWE points at claiming social and ethical ground. The territory that RWE structures is not only physical, but invests and influences the individual and social territories constructed out of specific affections and perceptions.

For these reasons, RWE does not operate within the territory, rather RWE *is* the territory: any visual clue that the region offers to the observer might very well be understood as a consequential effect of RWE's influence. As an example, generational engagement is pursued by the RWE Foundation, which invests in the schools of the area by offering trips, internships and other educational activities. Quite expectedly, the educational material that is offered in these courses claims and vouches for the necessity of coal-produced electricity, establishing RWE as a sort of 'a caring neighbor and socially responsible organization'.[35] In addition, as a sign of cultural hegemony RWE has acquired the Schloss Paffendorf in Bergheim, a former 16th century aristocratic castle transformed into RWE's representative building: a multifunctional center that hosts a permanent exhibition on coal and lignite extraction in the Rheinish region, an information point where guided tours to the mines and the power plants are organised, and ultimately an event center where - without any kind of fee - free lectures, concerts and weddings are held and celebrated.
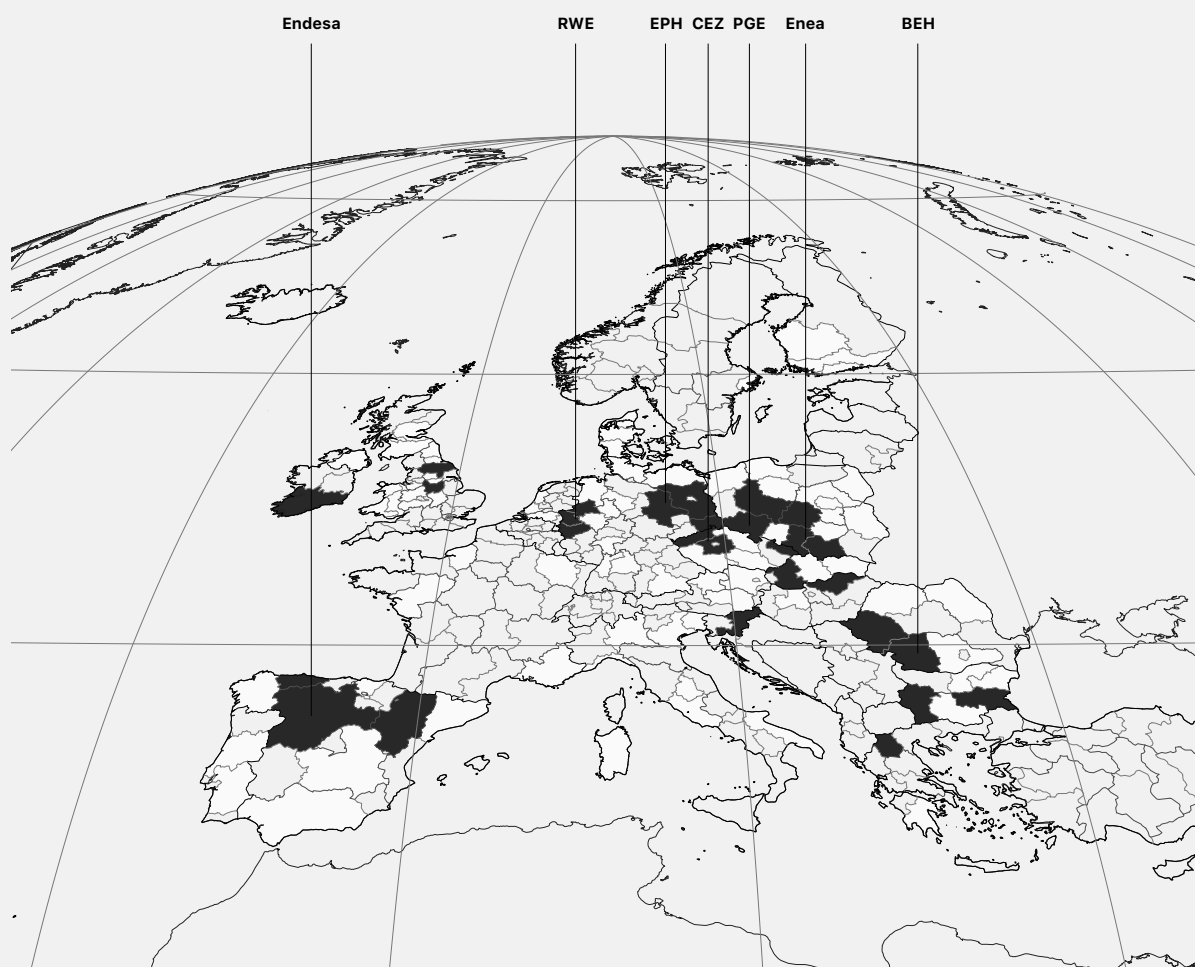
The power of RWE consolidated itself as the territory also against the numerous voices against its operations. Although it seemed to have disappeared from public opinion for 20 years, the fame of Hambach

32   Brock and Dunlap, 'Normalising Corporate Counterinsurgency.'

33   Brock and Dunlap.

34   Brock and Dunlap.

35   Brock, 'Securing Accumulation by Restoration – Exploring Spectacular Corporate Conservation, Coal Mining and Biodiversity Compensation in the German Rhineland.'

Endesa   RWE   EPH CEZ PGE Enea   BEH

Territorial Machines: European Coal and Lignite sites. drawing by author.

Robert Schuman signs the Schuman Declaration, 1950

started to grow again in the 2010s, when activist groups started to squat the remaining forest, coming especially from outside Germany: young danes, dutch, belgians of about 20 years old. Besides the first occupations of the forest from 2012, since 2015 the various movements began to merge under the Ende Gelande name - an annual event that has seen bigger and bigger waves of activists camping and building tree-houses in the forest.

The protesters have established a sort of 'headquarter' in the now-abandoned village of Morschenich, while the endangered forest is occupied by a squatters' camp composed of trailers, tents, caravans and tree-houses, accompanied by an array of supply shops and stores. Some of the activists have engaged repeatedly in open acts of insurgency such as invading the mining pit, sabotaging the electrical lines or occupying the coal-tracks. Every year - during the Ende Gelande - the usually desert mine backgrounds the fights between the activists and the North Rhine-Westphalia police - a choreography of white and blue suits marching toward each other. Some have been arrested, jailed; barricades have been burnt, high-voltage lines damaged.

Against these threats, RWE has conjoined the hard counterinsurgency operations - in which RWE's private security unites with the regional police, with soft PR attacks. Since its acquisition of the Forest in the Seventies, RWE has in fact invested big attention into public relations strategies in order to delegitimize oppositions, while legitimising its own. Public opinion

campaigns warn against the violence and riots of the 'terrorists' and, while criminalising the newcomers, push the residents to divide and distance themselves from them. Campaign materials include a poster reciting 'Opinion yes, Violence no', showing a RWE employee hit by a brick thrown at him. In a similar fashion, RWE's CEO, Rolf Martin Schmitz, has labeled the activists 'eco-terrorists'. A previous CEO called them 'criminals', affirming that 'they have no ideology, they are sheer criminals and are only interested in excessive violence'.[36] In multiple cases the criminalisation and delegitimization of the 'green wackos'' manifested the intention of delegitimizing residents-driven activities as well: 'the citizens' initiative 'Buirer for Buir', for instance, was denounced by the federal minister of transport at the opening ceremony of the new highway as 'liars' who 'manipulate people.'[37]

The Mine and the Forest - the Machine and the Garden - have become the political symbols for a social conflict that entails the whole Germany, and possibly the whole planet: the one between ecological sensibility on one side, and the industry and issues of job losses and depopulation on the other.[38] The work of Robert Smithson introduced an interesting reading of the dialectical relationship between these two parties. In the specific this regards a position towards mining activities, but, at the same time, it can be brought to the general as a tool for investigating the correlation between materiality and cognition. Smithson's work has been deeply influenced by the reading of Carl Jung and Anton Ehrenzweig. In fact, the american artist did not openly take

36   Brock and Dunlap.

37   Brock and Dunlap.

38   Rem Koolhaas et al., Countryside: A Report, 2020.

the side of ecologists, nor the industrialists, while he was more interested in making phenomenological,anthropological, and psychoanalytic analyses involved in social, political and cultural conflicts.[39] As art historian Timothy D. Martin has written on Smithson:

'As a negotiator between ecologist and industrialist he had to understand the types of enjoyment they sought, and to this end he made a fascinating distinction between the neurosis (hysteria) of the ecologist and the perversion (sadism) of the industrialist.'[40]

Regarding the figure of the Ecologist, Smithson 'diagnosed' what he called an 'ecological Oedipus' complex': like Oedipus, the ecologists would persecute mining in order to realize that their enjoyment of its benefits would be part of the same crime. For the industrialists instead, Smithson suggested a sort of 'unconscious sadism': on one hand, he noticed their 'lack of ability to observe the world, to be in and part of the world, which is replaced by the abstractions of technology and economics'; on the other, their activities on the ground were enacted as if they had a natural right to extract enjoyment out of the land, regardless of the 'pain' it might cause. Not differentiating between the two, his attitude revolved around a curiosity on how fundamental cognitive structures emerge from the material world and foster the cultural one.

For these reasons, he saw the role of his land art as a dialectical activity where the industrialist and the ecologist could come to terms, as both share a conflictual relation with nature that requires the acknowledgement of the entropic activity of the latter. A democratic confrontation is then, analogously, a 'political form of entropy', being 'always a failure, always a struggle toward entropy, yet always open to a restructuring because of its orientation to a primordial consciousness.'[41] Although this *epoché* - as suspension of judgement - has occasionally been criticized as a sort of ethical withdrawal, Smithson's point in doing so was to gain a detached perspective on what really mattered: analysing the fundamental relation between man and land. For these reasons, a similar attitude will guide the prosecution of this text as the following chapters will meander between mental, social and physical territories, acknowledging their coexistence and mutual inference.

39   Timothy D. Martin, 'Robert Smithson and the Anglo-American Picturesque,' 2011, 11.

40   Martin.

41   Martin.

Rhineland's Police faces ecologists during an occupation of the mining pit, 2019.

Robert Smithson, Entropic Landscape, 1977

Orogenesis

'Apparently more artificial than a mountain, but more natural than a monument, the mound seems to lie halfway between the two. The mound certainly differs from the mountain in that it is of a more human scale, and its formation undoubtedly owes more than that of the mountain to the labour of human beings and other living creatures. Yet like the mountain, its form is ever-emergent through the play of forces and materials'.

Tim Ingold

The territory of Rhineland is a direct and diagrammatic outcome of the processes that have happened on its surface. Because of the uncanniness that coats this territory, the elements that compose it seem to inform on the causes that have created them. Everything here seems to blatantly manifest its cause: the elements that constitute it occupy a place for specific purposes, have been moved for others. Valuable ground - coal and lignite - is moved to the coal tracks through which it reaches the power plants; invaluable soil has been displaced in the form of artificial mountains; urban soil has become where the mine workers' routines are enacted, and both are eventually transplanted elsewhere.

Yet, Rhineland's visual appearance might be almost entirely artificial, but it cannot be considered a fake: it is the result of a process of *orogenesis*[42], just some other forces rather than wind, rain and sun have enacted on its surfaces processes of eroding, enmassing and formation. Rather than from natural forces, this process of formation has been triggered by the economic value that coal and lignite had acquired at the end of the 19th century, conjoined by an identitarian value that

was accumulated around the harvesting and production of electrical energy for Modern Germany. As it has been argued in the previous chapter, the influence of RWE not only interests the property of the mining sites, but extends to the power plants, the municipalities' administrations and in general, the whole economy of the region. RWE has molded the site not only within what happens in the mines' borders but it has, in fact, transformed the entirety of the territory into an operational landscape, a logistical field whose handled 'matters' includes material products as lignite and immaterial ones as much as the rhythms of everyday life of its workers. From a Marxist perspective and in specific the idea of primitive accumulation, this land, the Machine, is not just there but it is *activated* through a selection of its elements to which are assigned functions in order to achieve its exploitation.[43]

The etymology of the term landscape in general resonates with this condition: -scape can be traced back to the old german -*schaft* which stands for shape, constitution, form.[44] Landscape, both in the sense of a practice related to vision and as a matter of containment and

42   The term *orogenesis* ('mountain-building') usually refers to the formation of mountains by the convergence of tectonic plates.

43   Pier Vittorio Aureli, The Possibility of an Absolute Architecture, Writing Architecture Series (Cambridge, Mass: MIT Press, 2011).

44   Merriam-Webster.com Dictionary, s.v. 'landscape,' accessed March 21, 2021,

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control, refers to the act of giving form to land in a way that it can be *com-prehended* - which is understood and possessed as a unitary whole.

As the anthropologist Tim Ingold noticed, the early hunter-gatherers territorialized without the definition of a fixed border, but by recognizing natural elements - mountains, rivers and so on - as means of orientation and identification with the landscape.[45] These points, a constellation scattered around a territory organized as such, were invested with special meaning and importance. A twofold relationship was established: to imagine a land and to imagine society.[46] It is therefore not a matter of how much technological activity is pursued upon certain territory, but rather a question about the cognitive relation we engage with a certain milieu.

If technology is defined as - in the words of Michel Foucault - 'a practical rationality governed by a conscious goal'[47], in this sense the natural territory of the hunter-gatherers in its becoming a territory can be read as artificial and produced: to signify and to address is already a technological act, being the act of devoting something to an end, even before the mediation of any technological object. On the other hand, human intervention can be thought of as already artificial, being the human anatomy a technicity characterized by ways of perceiving and effecting marks upon its environment eventually exteriorized in form of technical objects. The natural is not therefore opposed or prior to culture, but in this sense it is inextricably linked and intertwined with the artificial, or is already artificial as soon as it is activated and appropriated by cognitive abilities. Therefore, the agency of RWE transcends the process of combustion that transforms the carboniferous energy of the lignite blocks into electrical energy; instead, it comprises the capacity of framing and channeling all sorts of flows. In this sense, the orogenesis here mentioned shapes the immaterial topographies of labour and desire as much as the material and physical ones of the artificial peaks and the mining depressions. This activity would not be properly understood if thought as a spatial activity, nor purely a temporal one. Instead, it operates through both realms, as an operation of wiring among these forces that dictates at both times what happens where and how it happens.

In order to expand on this aspect, it will be useful to appropriate Deleuze and Guattari's concept of flow. The latter was transposed from the economic tradition that started from Adam Smith and continued with David Ricardo which compared the economic model to the circulation of blood in the body. A flow is then 'the transmission (or exchange) of money - or more generally, of economic value - that moves from one pole to another: that is, there is an incoming and outgoing flow.'[48] The 'pole' corresponds to individuals, groups or organizations that assolve the function of receivers, interceptors or exchange points of the flows involved.

45   Tim Ingold, The Perception of the Environment: Essays on Livelihood, Dwelling and Skill (London ; New York: Routledge, Taylor & Francis Group, 2011).

46   André Corboz, 'The Land as Palimpsest,' Diogenes 31, no. 121 (March 1983): 12–34, https://doi.org/10.1177/039219218303112102.

47   Steven Dorrestijn, 'Technical Mediation and Subjectivation: Tracing and Extending Foucault's Philosophy of Technology,' Philosophy & Technology 25, no. 2 (June 2012): 221–41, https://doi.org/10.1007/s13347-011-0057-0.

48   Daniel W. Smith, 'Flow, Code and Stock: A Note on Deleuze's Political Philosophy,' Deleuze Studies 5, no. supplement (December 2011): 36–55, https://doi.org/10.3366/dls.2011.0036.

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Orogenesis. drawing by author.
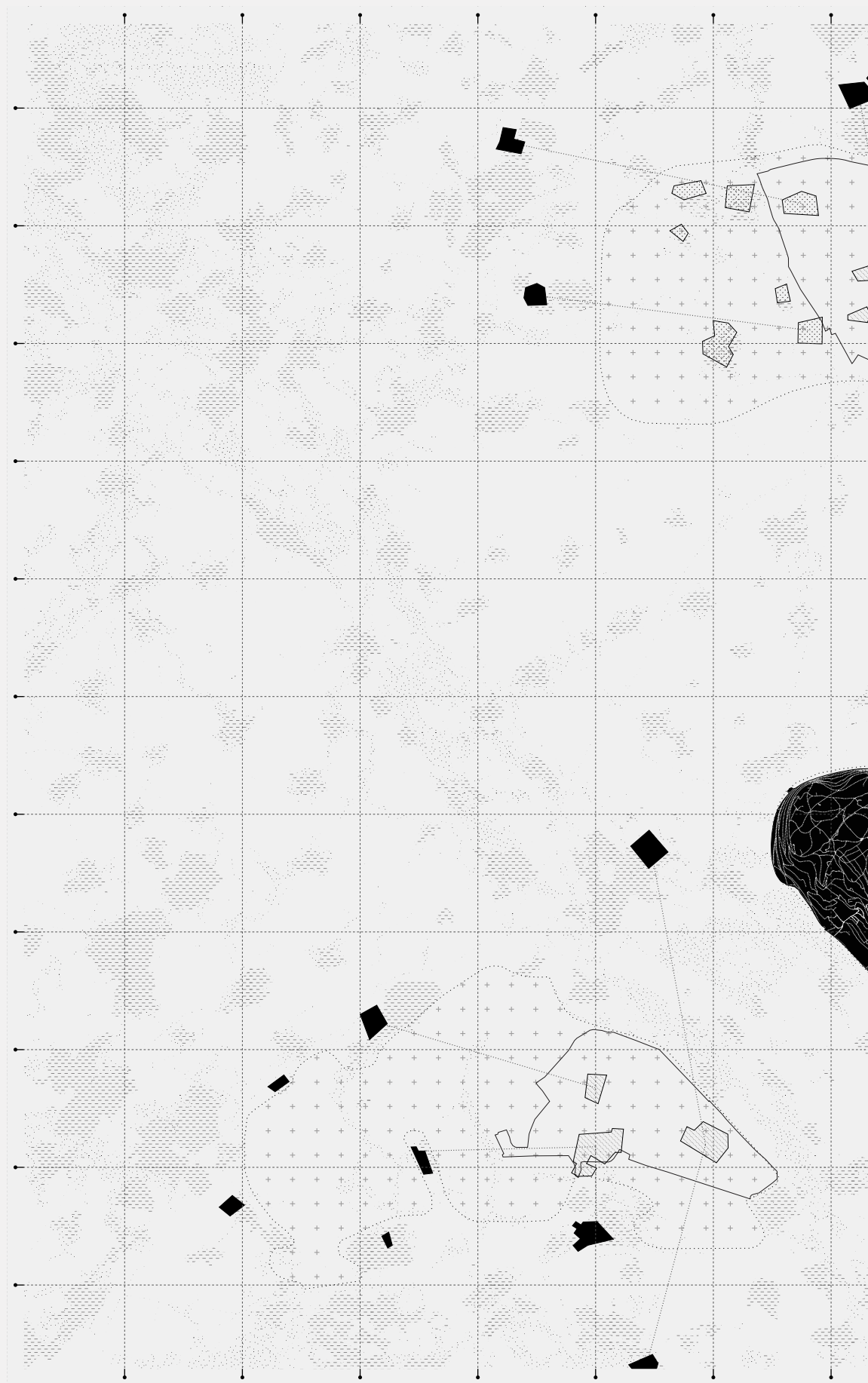
5 Km

To provide a concrete paragon to our case, the poles would correspond to RWE, to the individual workforce and to the materiality of the ground. Among these, a series of flows engage with the aforementioned poles, in a gradient that unapologetically covers the material as much as the immaterial: the flow of raw matter is materially transformed into electrical energy and displaced mounds; similarly, the flow of human energy is transformed into labour. In regards to the latter, in fact, Deleuze specifies how it should not be posed a distinction between the scale of the individual and the one of the social, as much between the material and the immaterial. In fact, as Deleuze has affirmed:

'Desire is part of the infrastructure' (...) 'our impulses and affects, and even our unconscious drives, what seems to be the most individual and personal part of ourselves - libidinal economy -, are themselves immediately part of what Marx called the economic infrastructure: that is, the material base of every social formation - political economy'.[49]

Consequently, it becomes clearly impossible to divide between the individuality of desire and the collectivity of social or economic production. The two are, instead, interrelated as the mental - molecular - reality flows into the collective - molar - social and economic constructions, while the latter simultaneously affects the individual.[50] In this sense, as the geographer Andre Corboz has written, 'this necessity for a collective relation to

be experienced between a topographic surface and a population established in its folds permits drawing the conclusion that there is no land without imagining a land: the land is a project'.[51] Therefore, a territory does not involve solely the imposition and control over the land - 'as a project' - but any geophysical order builds a mutual affection with the constitution of social and political orders, and their visibility in forms. This is a process of semanticization that becomes readable in these forms, crystallising the flows that have generated it and providing the foundation for the further ones to come.

This necessary yet metastable relation becomes easily understandable by referring to it as an *assemblage*, which asserts that in a body the relations between its parts are never fixed but are open to be rearranged and reconfigured: the assemblage then 'actively links these parts together by establishing relations between them'.[52] What precedes an assemblage is 'pure' matter - uninformed, raw and undifferentiated body - that provides the base for its further articulation in forms of content and forms of expression: while the first regards how matter acquires a sensible configuration, the latter directly refers to the translation of flows in physical, mental and social topographies.

The expressive, and not just functional, quality of a productive territory such as Rheinland is underlined by Gilles Deleuze and Felix Guattari who have used the concept of ritornello to define 'any aggregate of matters of expression that draws

49   Smith.

50   The concept of molar and molecular refers to Raymond Ruyer and it will be expanded in more detail in the following chapter.

51   Corboz.

52   Manuel De Landa, Assemblage Theory, Speculative Realism (Edinburgh: Edinburgh University Press, 2016).

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a territory and develops into territorial motifs and landscapes'.[53] Thus, ritornellos in their expressive power acquired in 'postures, gestures, sounds and colors'[54] represent a constitutive part in the formation of a territory, a process that Deleuze and Guattari refer to as territorialisation. As an example, even to trace a demarcation should be understood not just as a purely functional or administrative boundary but as the contingent expression to give order and structure to that physical condition: for this reason, to trace is a fundamentally artistic, and therefore expressive, act. As Deleuze and Guattari have written:

'The artist: the first person to set out a boundary stone, or to make a mark. Property, collective or individual, is derived from that even when it is in the service of war and oppression. Property is fundamentally artistic because art is fundamentally poster, placard.'[55]

In fact, through ritornellos, a territory 'reorganises functions and regroups forces', activating a selection of components through which a reality is constructed out of the real. It acquires a structure and an organisation among its parts or, as we said before, a wiring, affirming itself as a metastable selection from chaos. This is a fragile condition: while an agent might try to maintain the stability of the territorial conformation, this conformation will always be in tension with external forces of chaos and never granted. In this sense, it is important to notice how Chaos does not have to be charged with any negative connotation. Chaos - the

raw materiality - instead informs us on the multiplicity and thickness of the real, out of which different selections-from-chaos, different realities emerge. Therefore, while specific wirings might operate on the surface, in the underground other configurations wait to come to the fore: thus, *a whole can only be less than the sum of its parts*.[56] It is for this reason that any territory oscillates between waves of territorialisation and de-territorialisation, the latter individuated when a territory abandons its stability and a new set of potentials comes to actuality. Ultimately, a territory is always caught and it can only be grasped in its becoming.

In the light of this argumentation, to reduce a reading of Rhineland alternating between the 'positive' of Die Burge and the 'negative' of Der Tagebau would not be accurate. In between, a spectrum of different assemblages have taken place and that we would not be able to reach and grasp from purely visible clues. As an example, the welfare society that coated the mining operations in the Fifties and Sixties and gave rise to cannot be just considered analogous to the neoliberal turn that RWE took starting from the Eighties and that crystallised in different ways of engaging with the territory. Similarly, the sacred value that the Common Forst acquired during Middle ages and the extreme care that the villagers used to adopt in its regards is not to be considered analogous to the ecological awareness that today drives the coal phase-out.

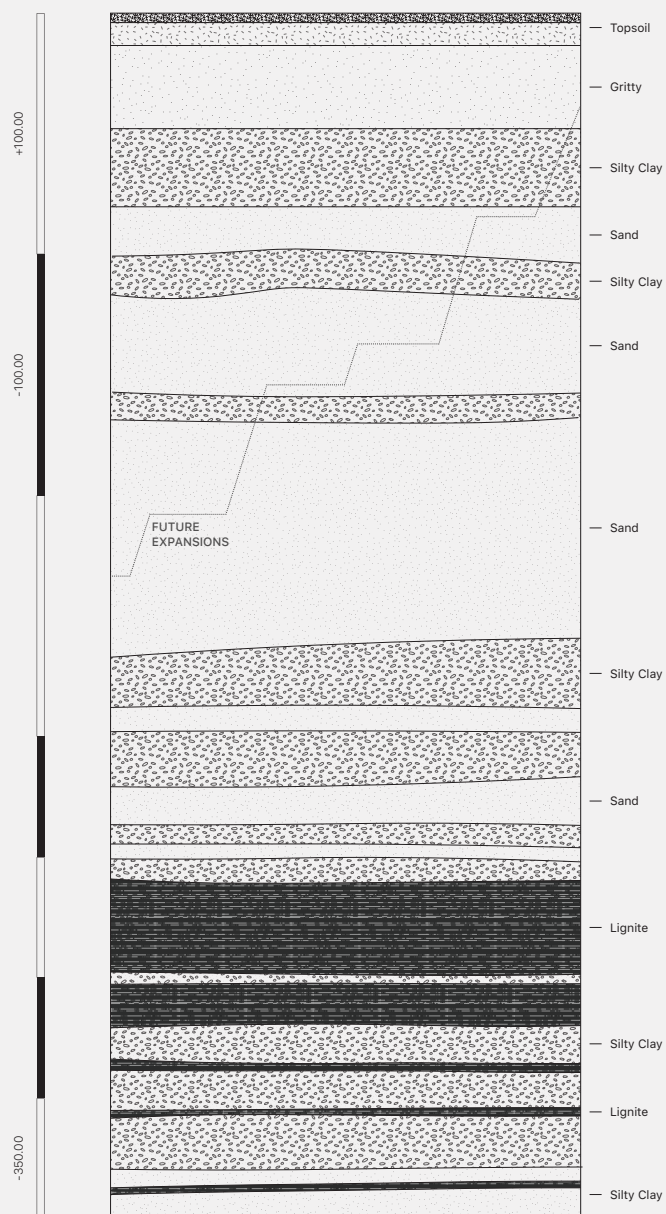All these multiple histories are a collection of differences, which all stubbornly

53   Arjen Kleinherenbrink, 'Territory and Ritornello: Deleuze and Guattari on Thinking Living Beings,' Deleuze Studies 9, no. 2 (May 2015): 208–30, https://doi.org/10.3366/dls.2015.0183.

54   Kleinherenbrink.

55   Kleinherenbrink.

56   Timothy Morton, 'Timothy Morton in Conversation with Verso', https://www.youtube.com/watch?v=1AEy2KmHwh0&t=196s&ab_channel=VersoBooks

Fragment of Lignite.

Scale markers (left axis): +100.00, -100.00, -350.00

Layer labels (right):
- Topsoil
- Gritty
- Silty Clay
- Sand
- Silty Clay
- Sand
- Sand
- Silty Clay
- Sand
- Lignite
- Silty Clay
- Lignite
- Silty Clay

FUTURE
EXPANSIONS

Soil Stratigraphy in Rhineland. drawing by author.

revolve and constellate around the site of these alliances, conditions and conflicts: the soil. Rather than pure novelty, these differences have exercised an activity of reorganisation - or re-programming - of a material haecceity that has and becomes expressive forming the territory.

To read the different stratification of reals as different activities of reprogramming could allow us to, on one hand, suspend any judgement on the aforementioned dichotomies - natural and artificial or fake and authentic - while on the other hand, to concentrate our focus on the implicit agency that each rewiring brings with itself. As shown in the previous examples, ritornellos - as pure expression - might not always provide us with all the clues we might need. Similarly, Deleuze and Guattari clarified how a territory is not just a problem of expression - but it is directly driven and brought together by the mutual interaction between content and expression. In order to grasp this aspect, we might instead focus on the operational and transformational relationality that ties content and expression, creating the conditions for 'the real' to come to the fore.

In this regard, it will be helpful to appropriate the idea of the machine as presented by Levi Bryant, that defines it as 'a system of operations that perform transformations on inputs thereby producing outputs'[57]. The idea of machines transcends the technical connotation that usually has in common parlance, as it refers to anything that is able to provoke change, channeling and wiring connections: in this sense, machines are the driving force of assemblage, the vectors through which certain configurations emerge out of matter. An assemblage is then a co-functioning, a 'sympathy, symbiosis, ... alliance, alloy'[58] - as it has been defined by Manuel De Landa - where different machines operate, as Levi Bryant as explained:

'Nature or being consists of nothing but factories, micro- and macro-machines — often wrapped within one another — drawing on flows of material from other machines and producing flows with new forms as their products in the course of their operations. In short, being is an ensemble or assemblage of machines.'[59]

Machines can work between material and immaterial inputs and outputs: they span from physical machines to abstract machines (languages), to incorporeal machines (the unconscious and the production of desire). To make an example for Rhineland, the soil-machine has operated in creating specific subsidence conditions, the 'economic-machine' has transformed its lignite stocks in salaries, and so on. In this sense it's important to notice what distinguishes a machine from ritornellos: if ritornellos - as a theater - are for expression and representation, machines - more like a factory - are a matter of production.[60] With this in mind, a distinction is ought to be made between the virtual capacity of a machine to execute certain operations and the actual manifestation of these, which is the expression. While the first is immanent in the machine, the latter might or might not come into actuality or rather do through qualitative (a change in property), mate-

57   Levi R. Bryant, Onto-Cartography: An Ontology of Machines and Media, Speculative Realism (Edinburgh: Edinburgh University Press, 2014).

58   De Landa.

59   Bryant.

60   Bryant.

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rial (a physical product that detaches from the machine) or agentive (an influence in behaviour) manifestations.

Speaking of Rheinland's 'orogenesis', different machines have operated on it as much as the territory has registered their qualitative, material, agentive manifestations: not only, it is made of these manifestations. The stratification of differences of which I have spoken before then is the stratification of different machines, operating transcalarly between microcosms and macrocosms, the tangible and the intangible, materiality and desire. As machines operate producing difference, machines operate creating information. This latter thought could even be generalized to affirm that then space performs as a result of this information: while this idea will be investigated further in the following chapter, for now this notion is useful to detach ourselves from the idea of a cartesian, blank space.

The idea of machines harshly contrasts the modern idea of space as a plain surface - a tabula rasa - populated by objects: something that has allowed land to become an object of conception and construction. Instead, space should be thought as a product of the web of interrelations among different machines: as Levi Bryant affirmed, 'space *arises* from machines, [...] conceived of as a network of paths between machines or nodes produced by machines'.[61] Euclidean space - as a blank, undifferentiated and heterogenous canvas is never actually experienced while rather it results as 'far from an innocent invention because it facilitates an agenda of conquest and domination, making of the whole world

not merely a tabula rasa but also a terra nullius ripe for possession and exploitation.'[62] Therefore, in place of an ever-fixed background, space must be recognized as the product of machines and their changing connections and interrelations; moreover, as the machines operate or as new machines appear new relations are produced and therefore space is always under construction: it adapts as much as we adapt to it.
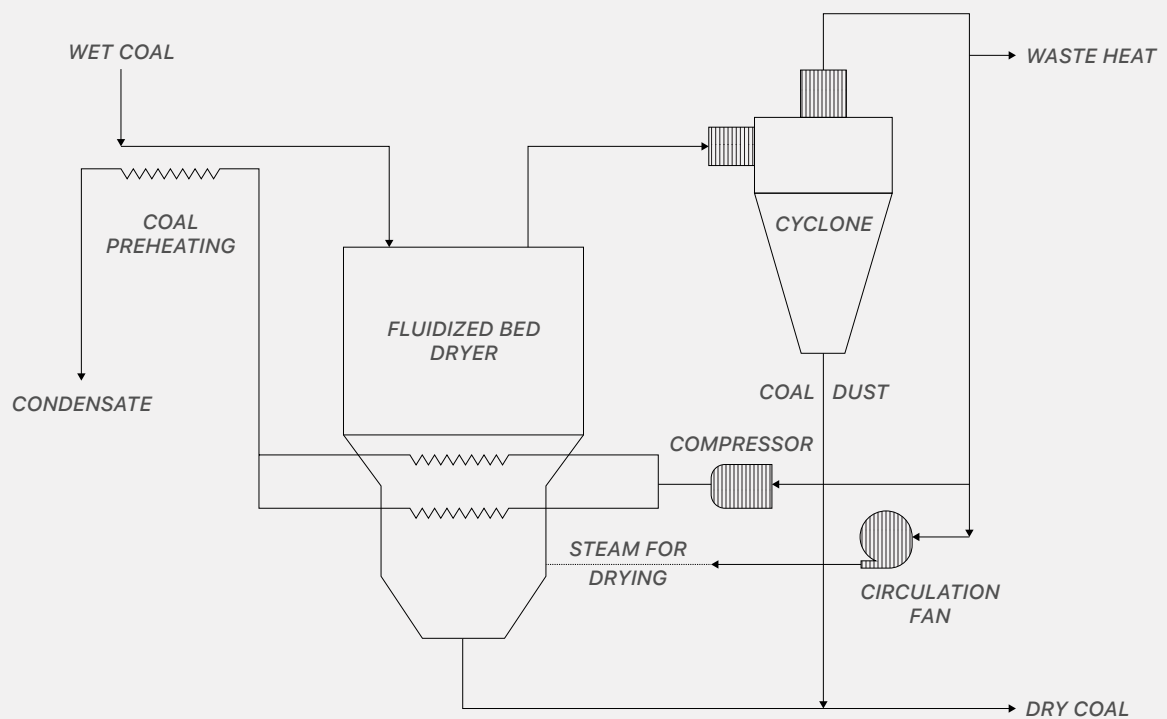
In order to find a gnoseological vocabulary to consider this conception of space, topology offers a different set of tools rather than euclidean geometry - beyond containers and contained, dimensions and size, limits and boundaries. Topology, in fact, accounts for relations of proximity or remoteness, accumulation or distribution; by thinking through topologies, we might be finally able to actually evaluate the relations and their configurations, and not only the dots that these connect - or not only the objects.[63] For this reason topological space allows us to consider 'the sphere of the possibility of multiplicity in the sense of contemporaneous plurality; as the sphere therefore of coexisting heterogeneity'.[64] Following these reflections, topological space is defined by the machines that cross it and any different topology is part of its respective assemblage. Consequently, space and objects cannot be reduced as performing on different and independent levels - as modernity has done: both constitute, in equal parts, its orogenesis.

61   Bryant.

62   Christopher Watkin, Michel Serres: Figures of Thought, 2020.

63   Watkin.

64   Doreen B Massey, For Space (SAGE Publications Ltd, 2012).

WET COAL

COAL
PREHEATING

CONDENSATE

FLUIDIZED BED
DRYER

WASTE HEAT

CYCLONE

COAL DUST

COMPRESSOR

STEAM FOR
DRYING

CIRCULATION
FAN

DRY COAL

Machine.
left: Process of drying and combustion of Lignite.
right: Niederaussem Power Plant in the background of a worker's settlement.

Carbonform

'The action of man, or his information, his imprinting nature - imprinting something in a form -, should this in-formation be considered in terms of a process proceeding from a free decision, from the freedom of this being? With this imprinting nature we get to the point where we must speak of a sculptural process: imprinting an act in matter. In this act, the sculptor is barely distinguishable from the printer.'

Joseph Beuys

Within and beyond the specific condition of Rheinland, the advent of carbon marked a huge change in the spatial configuration of our environment, enmeshing with cultural, economic and political aspects of social life. These new physical configurations - from highways to garages - have been a carrier of this carbon culture, being both cultural artifacts and behavioural patterns that have both sustained and reinforced it. In an interesting essay, Elisa Iturbe has pointed out how the architectural body has always been the result of a dialectic between space and energy.[65] We can easily notice how, through architecture, different assemblages have impressed their trace. As an example, the lines that constitute Ville Savoye acquire a certain conformation following the necessity of the car. Analogously, the entrance to Palazzo Barberini in Rome is marked by a ramp calibrated to a horse-carriage's demand.[66]

Both two examples, as Elisa Iturbe writes, 'show architectural form registering specific characteristics of energy through slope, width, radius, plan, section - that is such that each architectural typology registers the dominant energy systems'.[67] As f*orm follows energy*, the architectural body is seen as the receiver and interpreter of its current energetic paradigm. It registers and indexes these needs not only in receiving specific types of mobility - as in the previous examples - but in general the architectural form appears directly molded by spatial implications of a kind of energy.

In fact, as Mimi Sheller has pointed out, speaking of energy cultures, these assemblages are not composed solely by matter and energy but they are always accompanied by practices and meanings - narratives. Carbon-form is 'the coalescence of our energy culture' such that 'such infrastructuring becomes embedded in ways of life that fall into the background and become a kind of common sense'.[68] This carbon culture has created not only urbanization and suburbanization, other phenomena that affect how space performs, such as industrial agriculture and plastics. It has not only structured space but forged 'what Raymond Williams calls a structure of feeling'.[69] These narratives have, in fact, structured desires and

65   Elisa Iturbe, 'Architecture and the Death of Carbon Modernity,' LOG Overcoming Carbon Form, no. 47 (2020).

66   Iturbe.

67   Iturbe.

68   Mimi Sheller, 'The Origins of Global Carbon Form,' LOG Overcoming Carbon Form, no. 47 (2020).

69   Sheller.

futurities, social and political relations, natural and cultural imaginaries: taking carbon as an example, this has allowed a mainly privatized and individualized spatial experience.

In its 1537 treaty *De Natura Rerum*, Paracelsus argued that every physical thing in the world signals its invisible and hidden mechanisms through its form. Paracelsus called the science of understanding these hidden mechanisms through the visible form 'signatura, without which nothing deep can be discovered'[70]. A similar sort of signatura seems to steer and influence the course of architecture as it becomes the expressive manifestation of certain socio-economic paradigms. In light of these reflections, any sort of authorship falls short: in fact, rather than by the individual expression of an architect, architecture seems to be a direct output of these silent agents of history. For these reasons, we can speak of carbon-form as a sort of hegelian spirit that allows us to consider the possibility to think of architectural forms not as separate phenomena knownable by their function, morphology or typology, but as the arborescent expansion of potentials that precedes an assemblage. Consequently, if a carbon-form is existing, we could take a step back and contemplate that agri-form might have existed. Similarly, if a carbon-form is existing, we might as well speculate on the forthcoming emergence of silicon-forms.

The dialectic between the collection of singular forms and their signatura can be investigated drawing from Raymond Ruyer's distinction between molar and molecular forms.[71] Molar forms refer to aggregates, crowds or populations understood as the expression and representation of molecular forms atoms that operate as a 'structuring activity' similarly to the relation that an atom constructs with a substance. This dichotomy mirrors and coincides with the one between ritornellos and machines as expression and production that I have illustrated in the previous chapter. As Joseph Beauys compared democracy to a 'social sculpture'[72], we could analogously think of the myriad of forms (aggregate) that populate our built environment as a collective sculpture, expression of the structuring activity of carbon: as the poles around which flows wind and twine, forms similarly register this activity.
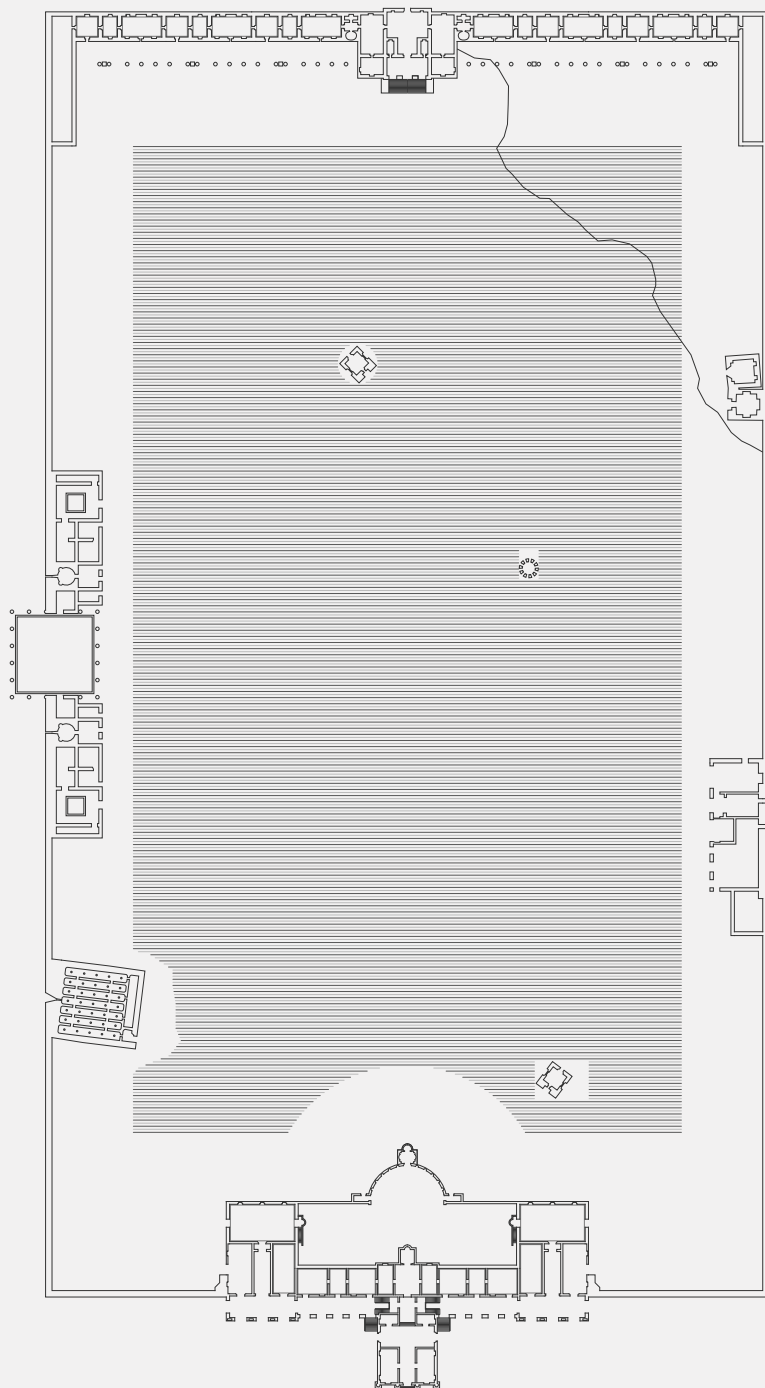
It is important to clarify that this text will detach from a problematisation in terms of energy to rather understand the aforementioned processes as the machine that transforms the material stocks that come from the Earth into information. This different orientation will allow, in the course of this essay, to avoid falling into a discourse on energy cultures - which is not the scope of this text - and rather dwell on the idea of form as a vehicle for information. In this sense, this conceptualisation connects to the previous chapter, as -forms can be basically thought of aside to the idea of machines that I have previously explained. At the same time, it will also be investigated how forms have been always open for adaptation when new conditions appear.

To elaborate on this subject, the concept of active-forms, as presented by Keller

70   Marina Vishmidt, Boris Groys, and Metahaven, eds., Uncorporate Identity (Baden: Lars Müller Publ, 2010).
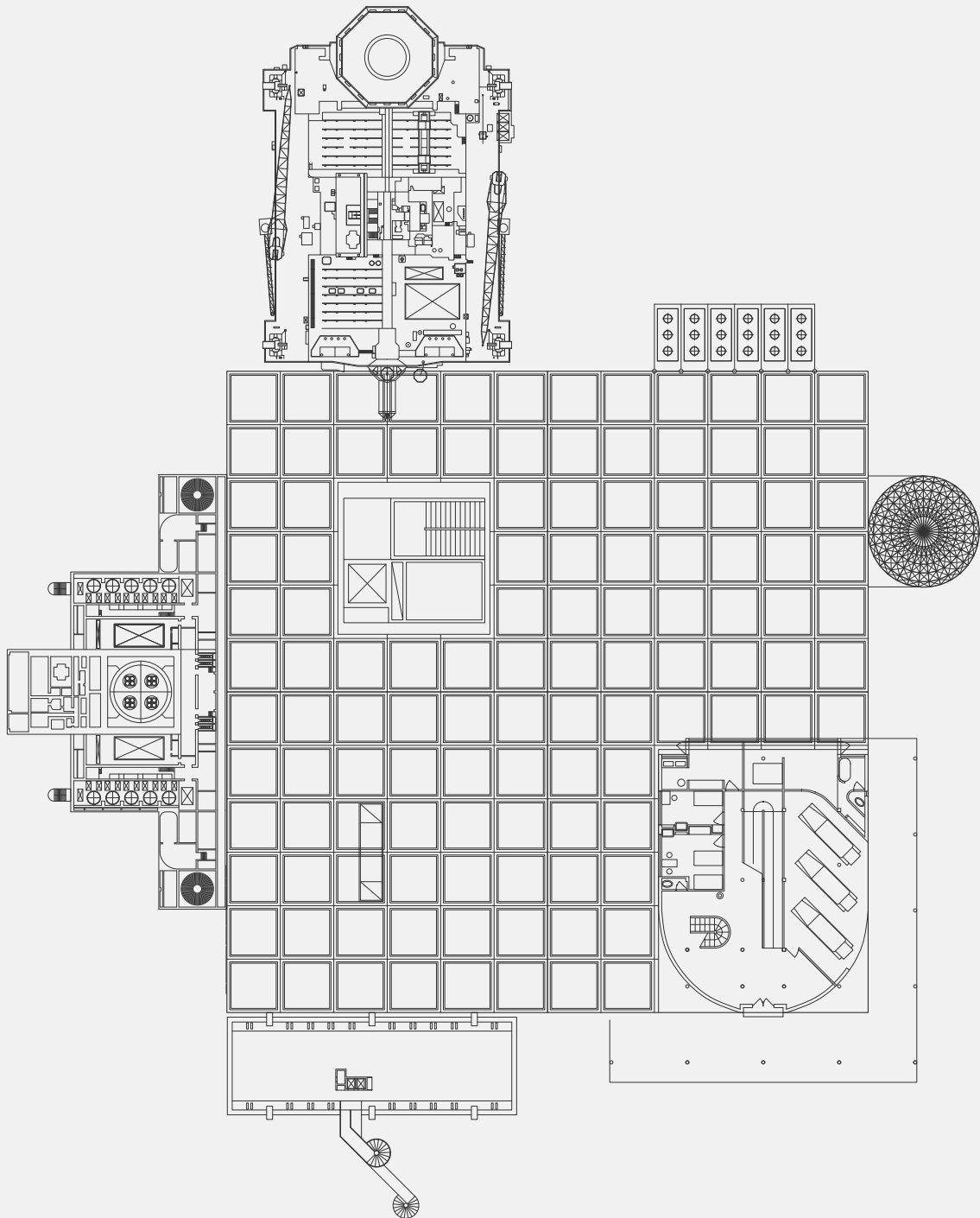
71   Daniel W. Smith, 'Review of Raymond Ruyer, Neofinalism,' Parrhesia: A Journal of Critical Philosophy 27 (2017): 116–28.

72   Claudia Mesch and Viola Maria Michely, eds., Joseph Beuys: The Reader (Cambridge, MA: MIT Press, 2007).

Agriform
drawing by author

Justus Utens, Villa di Poggio a Caiano, 1580.

Jacques Tati, Traffic, 1957.

Carbonform
drawing by author

Easterling, is useful in explaining how spatial information is organized and circulates. Keller Easterling in fact argues that, although we usually think of built forms as static objects, these are in reality active as they carry a stock of information that provokes influence and 'bends behaviour'.[73] Active-forms are constantly referred to the metaphor of an operating system to describe these as bits of a code that determine the possible activities in a software. Under such circumstances, we might be tempted to think of space as an information system only when equipped with sensors and digital media; instead, to the extent that it 'creates a difference', it creates influences, intentions and relationships that constitute information. Active-forms are characterized by a disposition[74] that indicates the propensity of something in favouring certain things over others: glass does not need to break to unveil its brittleness, but to be aware of its disposition allows us to handle it with the due attention. Similarly, spatial organisations can imprint - establishing and reinforcing - certain feedback loops of the real, channelling and sequencing effects and affects.

Speaking of carbon form, an example of an active-form can be considered the garage: the mass diffusion of vehicles in suburban developments required this kind of space to be annexed to every residential unit: it was the car - together with its speed, its steering radius, the culture related to it, that determined on one hand, highways, exurban zones, malls etc. but

also the ideas of freedom connected to it or, in general, the structurations of feeling of which I have already spoke before.

Following this argumentation, a city changes because of the multipliers that circulates within it: cars, but also elevators, mobile phones, laws and protocols, revenues in real estate operations, maintenance and so on.[75] For example, in *Delirious New York*, Rem Koolhaas makes a similar point in noticing how the american city 'genetics' were founded upon a set of what we have now defined as active-forms: its rectangular and abstract grid, the height regulations and the step-back rule, the elevator. On the latter in particular, we might notice that as the garage was a spin-off of the car, the typology of the skyscraper becomes - and in the famous cover of Delirious New York by Madelon Vriesendorp - the 'product' of the encounter between the invention of the elevator and the voracious need for exploitable square meters by NYC's real estate industry. Therefore the elevator became 'an active-form with a disposition to multiply urban environments'[76].

Quite unexpectedly, a similar understanding of this apparently new idea about form comes from Aldo Rossi's *The Architecture of the City*, first published in 1966. Here, he implicitly adopted a very similar understanding of the space of the european city as an information system, noticing how - beyond their original function - certain elements of the city possessed the ability of influencing

73   Keller Easterling, Extrastatecraft: The Power of Infrastructure Space, Paperback edition (London New York: Verso, 2016).

74   Disposition, linked to Foucault's dispositif and Agamben's dispositio, is 'literally everything that has in some way, the capacity of capturing, determining, orienting, intercepting, shaping, guiding, securing or controlling, the behaviors, the gestures, the opinions, the discourses of living beings or substances.' in Ibid. 72

75   Easterling, Extrastatecraft.

76   Easterling.

the overall city structure[77] and therefore performed as active-forms, inscripting and *coding* a certain set of potentials. Introduced by Gilles Deleuze, the concept of code precisely indicates the activity of transmission and reproduction of information, as it has been explained by the philosopher Daniel W. Smith:

'Coding operates through a process of inscription or recording: in other words, by means of signs, whether these signs are numbers on a bank statement or marks inscribed directly on the body. These signs are non-signifying: that is, it does not matter what they 'mean' or 'symbolize' per se. What matters is how they function in the determination of a flow.'[78]

It is important to notice that code and flow - are complementary: code inscripts flows and, at the same time, it is only through coding that we can grasp the flows that determine this operation. Thus, we can interpret Rossi's forms as the alternance between coding and decoding: a form might emerge as coding of certain information but, while its latent properties affect the overall city-form, it is always open to be decoded and inscribe new flows.

Similarly, following the idea of code in the specificity of Rhineland, it will be then clear how the parts that constitute it - as the villages' urban form - have registered in their form the flows that have traversed its fundamental matter: the soil. The collective form that the villages acquired surrounding the common forest has coded the political nature of it together with its specific structures of feeling; likewise, the current conformation of the towns around the mine registered the progressive individualisation and neoliberalism turn at the scale of their urban form - gated suburbias - and of their singular events - the residential units: the new economic value that the lignite strata acquired decoded the previous spatial configuration and recoded it into an expression of it.

Coming back to Beuys and to the idea of orogenesis, these transformations have interested the vast scale of Rhineland as a sculptural process, in which the geophysical strata of the soil that supports this region has been molded from rawness into different forms of collective individuation. This sculptural process has invested the different collective identities, while the relics of the past ones - as its material substratum - have sedimented and stratified in the area, drawing a 'genealogy of the sensible'[79] in constant evolution. In fact, a coded phenomenon is never final but always coated with a surfeit or surplus of sense that allows it to evolve from coding to decoding. This surfeit of sense is 'expressible, capable of generating ideas, concepts, sensations and representations' as life 're-orients itself to the interpretation of sense, to the transformation of objects into signals and signs'.[80]

Thus, the conflicts that animate Rhineland can be read as the dialectic between the present coding and a nostalgia for the past as for the future. In example, the fragment of the existing forest is coded by the ecologists as the remnant of a lost, pure

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77   Aldo Rossi, L'architettura della città, 2. ed, Abitare 4 (Macerata: Quodlibet, 2012).

78   Smith, 'Flow, Code and Stock.'

79   Defined as 'a way of thinking the historicity of human desire and aesthetics' in Bernard Stiegler, De la Misere Symbolique vol.1

80   Elizabeth Grosz, 'Deleuze, Ruyer and the Becoming-Brain,' Parrhesia: A Journal of Critical Philosophy, no. 15 (2012).

relationship with a subjectified Nature; few kilometers away, lookout bridges and viewpoints serve as an anticipatory infrastructure for the lake and its future touristicization: in both cases, these elements participate not only in composing it not only on a physical level but at the level of desire as well.

In this sense, we can affirm that a certain relationship is drawn between forms, their embedded 'memory' and the ability in providing the necessary foundation for future rearrangements. On this point, Bernard Stiegler has provided a peculiar view on technics and memory: 'more than merely a part of the environment humans inhabit; technics constitute our experience on every possible level, from retention to anticipation, and from cultural history to genetics'[81]. Thus, memory is constituted by technics and the different constitutive processes that different technics have given rise to are named processes of grammatization.

Grammatization is then the process of discretization that from the continuum of psychic memory becomes inscribed to external memory supports, such as writing. Although Stiegler's account of grammatization mainly refers to the evolution from alphabetic writing to ubiquitous computing, in this case the architectural form and - in specific - carbonform can be understood as the inscription of technics and therefore an analogous 'becoming-gramme'[82]. As 'Memory constitutes the "state of the mind or soul" of the individual', it is through the mnemonic quality that characterises technics that the individual is able to relate to the collective:

'We are therefore defined by this [...], we are defined by a past that we ourselves, as individuals, have not lived; this past is brought to us through culture which is the amalgamation of the 'technical objects that embody the knowledge of our ancestors, tools that we adopt to transform our environment.'[83]

Thus, an important point in the way technics - from architecture to media - constitute memory can be conceptualised following Stiegler's reading of retentions and protentions, developed from Husserl's phenomenology. Simply put, while retentions refer to the past time of memory, protentions refer to the ability of memory in 'anticipating the future'[84]: the horizons of expectation or the 'desire of the future' as it has been called by Stiegler. In this sense, the architectural body can be read as the crossroad between retentions and protentions, mediating between the as-it-is and the what it could be. Furthermore, these thoughts on architecture, understood as the basis of collective experience and its subsequent horizon of expectation, make understandable how an environment relies on the transmission of information through the expressive phenomena it generates, which will be the argument for the following chapter.

81   John Tinnell, "Grammatization: Bernard Stiegler's Theory of Writing and Technology", Computers and Composition 37 (September 2015): 132–46, https://doi.org/10.1016/j.compcom.2015.06.011.

82   Tinnell.

83   Tinnell.

84   Bernard Stiegler, "Nanomutations, Hypomnemata and Grammatisation", arsindustrialis.org

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Siliconform
drawing by author
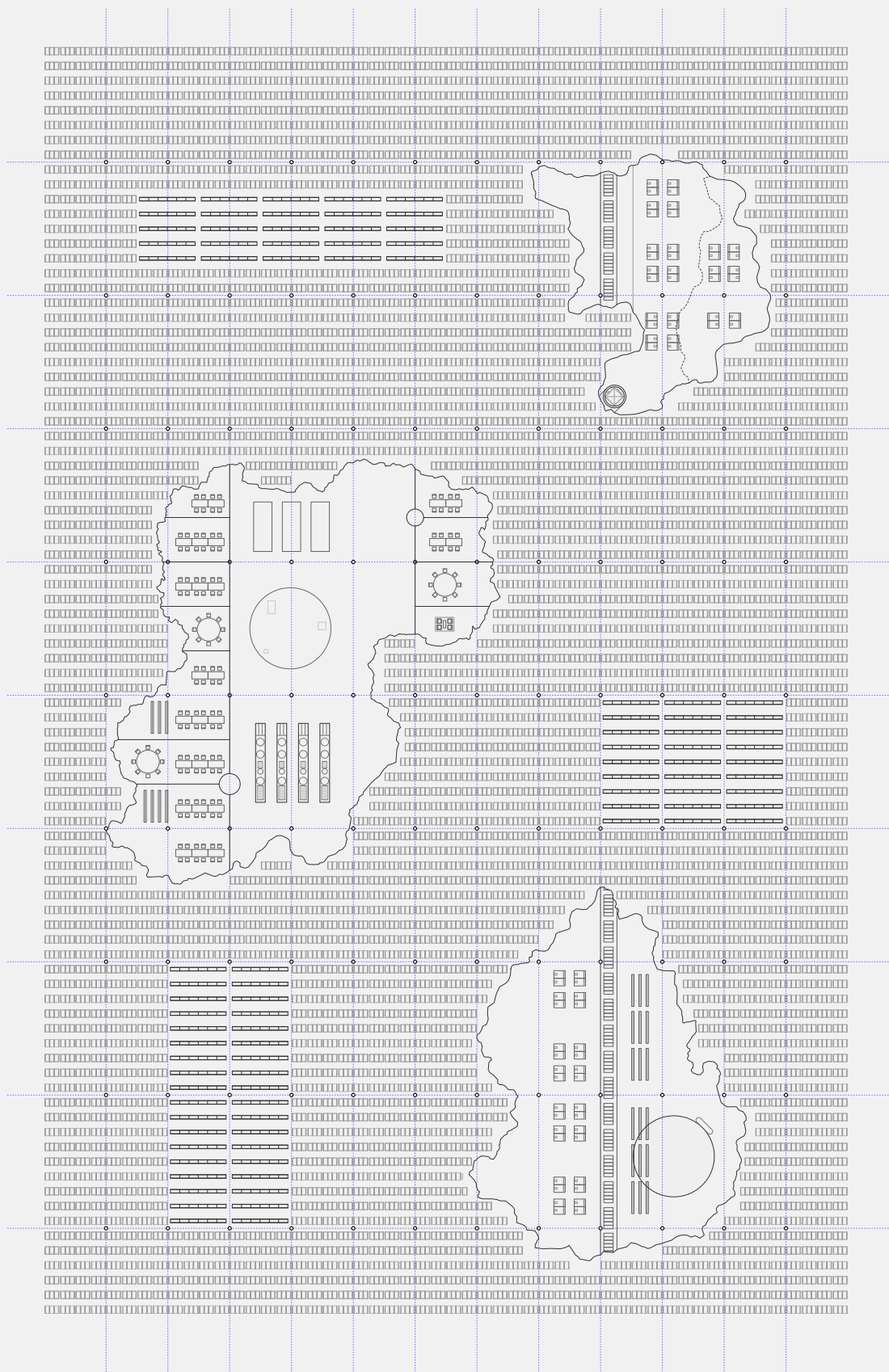
Medianature

'Media materiality is not contained in the machines, even if the machines themselves contain a planet. The machines are more like vectors across the geopolitics of labor, resources, planetary excavations, energy production, natural processes, from photosynthesis to mineralization, and the aftereffects of electronic waste.'

Jussi Parikka

As previously argued, we usually look at built-forms like collections of objects and volumes while we opacize the relations that have created them and that themselves create as actors, or active-forms. Similarly, while we usually consider matter as a stable and ever-fixed presence, we rarely ask which ideas and values coat them. Instead, machines operate from the material and influence the affections and perceptions that are conducted upon that matter, and they become implicitly inscribed in certain gestures, perceptions and feelings towards it.[85] The previous chapter has investigated how agri-, carbon- or silicon- forms precisely operate in this sense, although considering them individually. Instead, this chapter will zoom out to abstract the very operation that allows to configure physical, social and cultural assemblages.

The evolution of Rheinland and its current tensions can in fact be brought to what is the very site of the conflicts: its soil that, as a medium, has fostered different spaces, different topologies, different natures but also different idealities and epistemologies. For long, the term media has been related to information and both terms have been connoted as immaterial and invisible: a sort of mysterious

force and a powerful tool that is able to influence and steer the masses. Instead, it is through media that it is possible to consider the very activity of transmission from 'raw, undifferentiated' matter crystallises in the forms of content and expression that have been previously illustrated[86]: in other words, in environments through which anthropic activity on Earth happens and gets signification.

In fact, the activity of all sorts of media can be abstracted in the ability of reproducing certain favourable features that the natural environment as such does not provide. Alternatively, they eliminate other features that instead we find dangerous, disadvantageous or uncomfortable. In doing so, media actually behave like other natures: modifying or replicating the affordances of a certain environment, media create opportunities and limits, favouring certain modes of being, relating in opposition to others. As a territory, or a landscape might offer pre-existing points of interests like a peak and might favour certain actions and prevent others, similarly media tend to prescribe and facilitate certain connections instead of others: as Langdon Winner famously affirmed, technics - in this sense media - act like implicit laws, determining the bound-

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85   This point has been discussed in the Orogenesis and Carbon Form chapters.

86   From Orogenesis chapter.

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aries for action.[87] Performing as such, media tend to fade from active cognition: it is a process of naturalisation or backgrounding that Nigel Thrift has explained as follows:

'All human activity depends upon an imputed background whose content is rarely questioned: it is there because it is there. It is the surface on which life floats. At one time, the bulk of this background would have consisted of entities which existed in a 'natural order', all the way from the vagaries of the surface of the earth through to the touch of currents of air or the itch of various forms of clothing through to the changes in the sky.
But over time, this background has been filled with more and more 'artificial' components until, at the present conjuncture, much of the background of life is 'second nature', the artificial equivalent of breathing. Roads, lighting, pipes, paper, screws and similar constituted the first wave of artificiality. Now a second wave of second nature is appearing, extending its fugitive presence though object frames as diverse as cables, formulae, wireless signals, screens, software, artificial fibres and so on.'[88]

We could synthetically say that the condition for the expression of a territory to happen, imposing certain spaces and temporalities, essentially relies on these backgrounded protocols that implicitly determine the unfolding of collective life. Therefore, media 'are vessels and environments, containers of possibility that anchor our existence and make what we are doing possible.': they represent the frame in which collective life can take place and in which 'possibilities' are therefore 'contained'. In his 1934 text 'A Stroll Through the Environments of Animals and Humans' the german biologist Jakob Von Uexhull conducted behavioural studies on animals, and his conclusions trace some analogies regarding the activity of 'framing' that media bring.

Uexhull's main interest regarded how different forms of life share the same space, concluding that each animal constructs its own environment, its own space for agency out of its specific perceptions, actions and relations. Each of these bubbles of agency, as he calls them, is an Umwelt - an environment that is not absolute but comes from the selection often overlapping by different animals that share the same ecosystem.[89] For this reason, Umwelts are not self-enclosed environments: they are not independent and separated realms. Instead, they are by definition intersecting between each other and between different scales. In example, the wasp's umwelt does not only comprises the wasp and the orchid, but it intersects the orchid's umwelt, which transforms solar energy photosynthesis, and the global umwelt of energy exchanges.[90] In general, an Umwelt encloses a specific range of agency - a reticularity[91] - not only among certain agents, but defines what these agents select to perceive and affect.

87   Andrew Feenberg and Langdon Winner, eds., Technology and Democracy: Technology in the Public Sphere. (Oslo: Senter for teknologi og menneskelige verdier, Univ., 1997).

88   Cited in Erich Horl, 'The Technological Condition,' Parrhesia: A Journal of Critical Philosophy, no. 22 (n.d.): 2018.

89   Jakob von Uexküll et al., Ambienti animali e ambienti umani: una passeggiata in mondi sconosciuti e invisibili, 2013.

90   Brett Buchanan, Onto-Ethologies: The Animal Environments of Uexküll, Heidegger, Merleau-Ponty, and Deleuze, SUNY Series in Environmental Philosophy and Ethics (Albany: SUNY Press, 2008).

91   In Simondon, the term 'reticularity' indicates a model of collective relation.

Analogously, the concept of Umwelt allows us to think of space not to exist as 'there', but as forming out of the relational field that each being entangles with its environment. In this sense, this concept is coincident with topologies although it allows to consider the dimensions of perception and affection that each being entails with its environment.

Hence, it is a process of signification in which meaning is constructed out of a limitation, rather than free selection: it emerges out of a balancing act among potentials, opportunities and events and delimits the frame. Media corresponds to this relational field as these essentially perform in establishing relations. Consequently, when new media take ground new relations are discovered and produced: new spaces, other natures. This reflection is useful for two reasons: first, because it allows to consider the artificial and the natural beyond positive or negative connotations, focusing instead on how life produces certain fields of agency out of the reservoir of the Earth; secondly, it is useful in order to notice how we do not stand in a position of domination on top of the media we use but we are modeled by them as much we model them. To expand on the latter, the individual should be understood as emerging from its milieu and, thus, it is not a sort of pre-given and finalised entity that freely acts upon it. Consequently, the modern conception of technics (and media) ignores this recursive nature and by doing so, it negates the collective value that media bring which is not only fundamental but, as we will see, its conditio sine qua non.

Gilbert Simondon's work has been majorly concentrated as a critique of the hylo-morphic schema qua philosophical background of the modern relation with media that I have just illustrated.[92] Refusing the latter, Simondon argued how technics perform *allagmatically*, creating exchanges among the parties involved.

In this sense, individuals and collectives are not pre-given or final entities that act upon a milieu but both result from the milieu through a process of, respectively, individuation and transindividuation.

What allows individuation is basically the transmission of information that through matter is able to be distributed between the elements that compose a milieu and through that come into expression. Simondon has affirmed how the condition for transindividuation is transduction: it indicates the propagation of an activity within its milieu, it is 'a physical, biological, mental or social operation by means of which an activity propagates from one location to another (de proche en proche), within a given domain, basing this propagation on a structuring of the domain [...]'.[93] In fact, it is through transduction that concepts, affects and percepts can circulate through the social body as it is through transduction that the same can be absorbed by the individual body: in this sense, for Simondon, information is what structures the real, or the given, as a territorialisation out of 'the world'.

As a parenthesis, McKenzie Wark has written how 'History is a process in which collective human labor transforms nature into a second nature to inhabit. On top of which it then builds what I call a third nature made of information, which not only reshapes the social world of second nature but which instrumentalizes and transforms what it perceives as

92   Gilbert Simondon, Cécile Malaspina, and John Rogove, On the mode of existence of technical objects, 2017.

93   Styhre, A.. (2010). The concept of transduction and its use in organization studies. E:CO Emergence: Complexity and Organization. 12. 115-131.

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a primary nature in the process.'.[94] In the light of the latter conclusions, we might affirm instead that there is nothing such second nature made of information to account: as the play between form and information is already immanent, 'history' is rather the process in which different degrees of transduction have been activated and eventually exploited. From the foucauldian disciplinary societies to the deleuzian control societies, what has changed is an ability in deploy technics in ways that could channel and control the transfer of information, from the school and prison as a mold for the body to the current digital interfaces as a mold for the brain.

Coming back to our topic, the idea of transduction is meaningful to this argumentation as it considers the unfolding of different forces and flows together with individuals, collectives and entities: it thus allows us to consider the continuous transmission between these different realms rather than separating them. It is for this reason that transductive processes are the necessary operator in the constitution of collectivities: as any collective essentially relies on something that is shared among its members, transduction explains the transmission of information through both material and immaterial layers that, simply put, allows for things to be consistently sensed, experienced and known in a group. At the same time, this process does not happen in an independent way but it can be thought of as being deeply influenced by the material substratum it relies on. This thought is useful as it challenges the modern binary between the social and the natural, a separation that always leaked.

In fact, modernity has built a sort of linear relationship with media. On one hand, because of the modern understanding ; on the other, as the division line it traced between matter and form. As explained above, the character of media is, instead, implicitly oblique. For these reasons, what might interest us more here is the *diagonality* through which media operate: media enjoys the critical capacity to bypass the boundary between the social and the natural, the human and the non-human, form and information, which in turn allows us to conceive a world order of things unencumbered by the bifurcation between all these binaries.
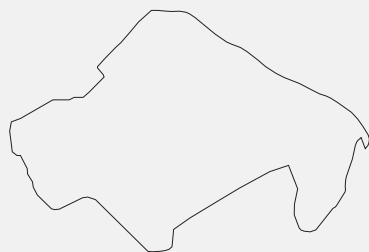
The double-bind between the natural and the social - as co-constituting spheres - is quite powerfully and synthetically addressed in the concept of medianatures, as presented by Jussi Parikka. Medianature affirms that 'media history conflates with earth history; the geological materials of metals and chemicals get deterritorialized from their strata and reterritorialized in machines that define our technical media culture'.[95] Although the appearance of new media - be it in the form of infrastructures, architectures, rules, be it in the form of the digital media - is vouched as an 'expansion' of capabilities, in fact it is rather an operation of framing and reframing that recursively operates on the material stocks of which we dispose on Earth. What is most interesting in this, is the ability in almost endlessly reconfiguring, reformatting or rewiring the points space is made of.

Thus, media can be intended, simultaneously, as extensions of man - following Marshall McLuhan but also Simondon and Stiegler - and as extensions of the Earth.[96]
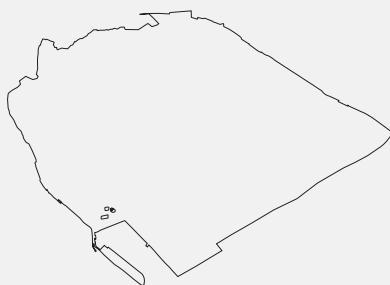
MEDIANATURE

94   McKenzie Wark, Sensoria: Thinkers for the Twenty-First Century, 2020.
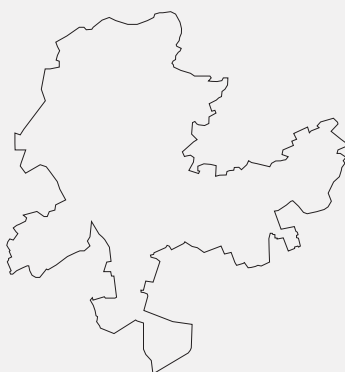
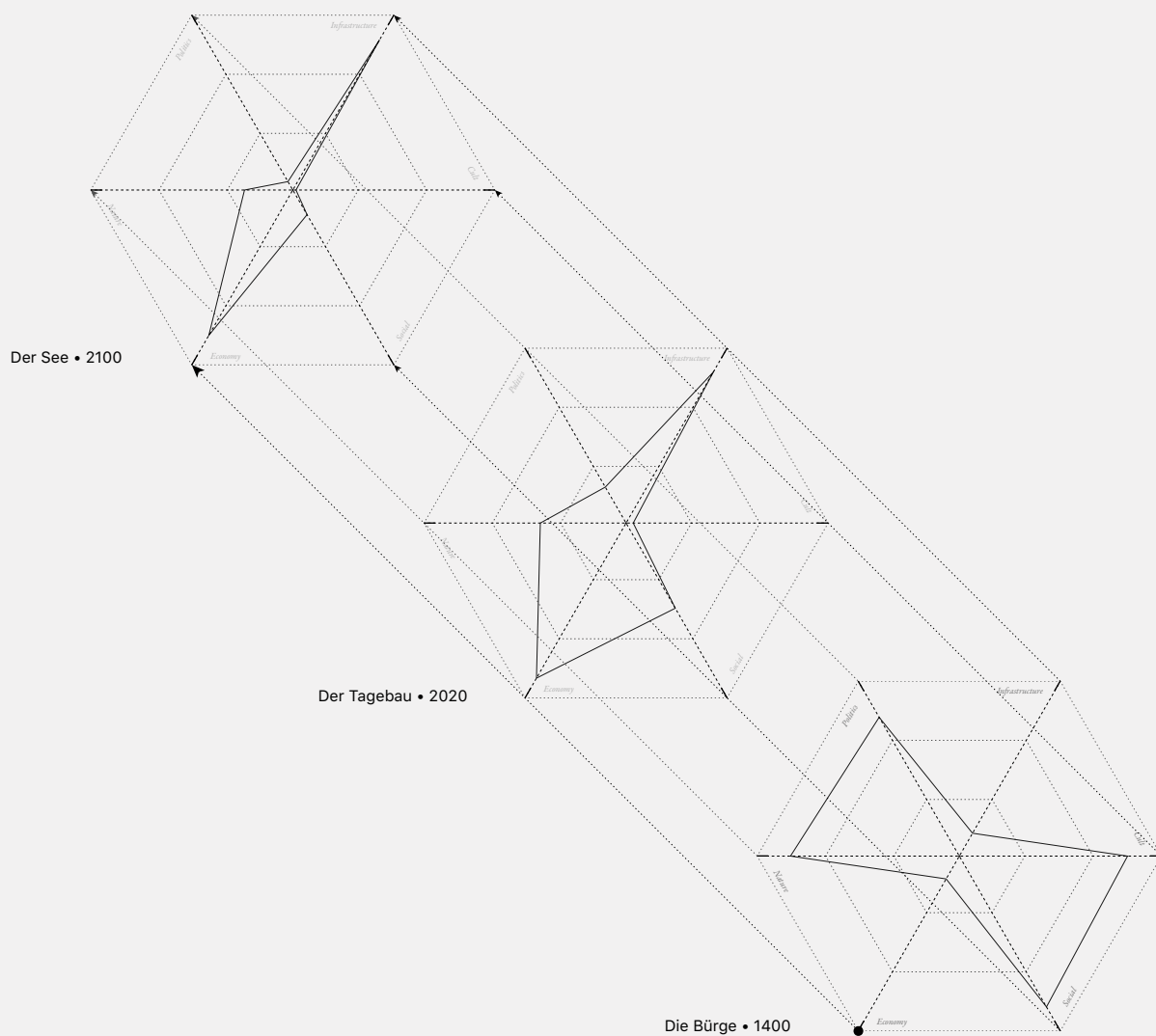95   Parikka, A Geology of Media.

96   Wark, Sensoria.

Der See • 2100

Der Tagebau • 2020

Die Bürge • 1400

Der See • 2100

Der Tagebau • 2020

Die Bürge • 1400

Soil Idealities: Natural, Political, Infrastructural, Cult, Social, Economical .
drawing by author.

In being so, media are caught in between - as if in equilibrium - the microcosm of the individual being and the macrocosm of planetary, worldly processes.

Architecture can be therefore thought as the activity - or as the machine, as I explained in the previous chapters - that most directly addresses the Earth in its recombination in forms of materiality, ideality and reality[97]: 'Architecting' is the flow of these forces. At the same time - beyond disciplinary boundaries - technical activity qua exteriorization in technics, protocols, legislation, ownership models, (more?), enacts forms of distributed agency[98] which nonetheless address the same flows. In this sense, the architectural body should be thought of as a medium as much as these other sorts of media can be thought of as architecture. Regarding the first assumption, I will quote here a fragment from Markus Miessen that synthetically resumes this point:

'*To do architecture is to immerse oneself in a conflictual process of material production—participation is not a productive encounter of multiple practitioners and stakeholders, but a set of conflicts, negotiations, maneuvers, and swindles between and within a multiplicity of agents, human and nonhuman alike—equally including architects, clients, financiers, and builders, say, but also silicon, plastic, concrete, each with its conflicting aims and different material means to achieve them. Every building is thus the materialization of such an encounter.*'[99]

If this affirmation considers Architecture as the whole that contains a multiplicity of agents, in order to respond to the second assumption this point of view can be also reversed: the actors involved inform as well the assemblage that Architecture constitutes, converting its datum into new forms of expression. Thus, to think Architecture in terms of media requires to gain an horizontal point of view on the elements that compose the real. Thinking through media puts on the same plane physical forms, social structures, memes, ways of saying, behaviours, gestures etc.; it abhors the need to create hierarchies between material and immaterial substances, high and low contents, serious or facetious purposes. It is a powerful concept as it equalizes between apparently inconciliable forms (a thing or an organisation? A plan or an intention?), circumventing linguistic biases that might oppose 'shape' as as-found and 'form' as reason, as equipped with authorship. Instead, media are such without the need of anyone to design them as such; rather their acknowledgement allows us to forget about the fixed, the solid, permanent appearance of the phenomena we deal with, while instead focus more on the actual relations they foster.

In this regard, as we face a forthcoming ruin of the Modern, we might have the opportunity to pursue a sort of geological invenstigation. In fact, the territory of Rheinland is constelled by the visible phenomena - or byproducts - that have registered how the soil as a medium has been conceived for modernity: the

97   'To transform these conceptions of givenness, a necessary, albeit always provisional myth, is to intervene in the world on a diagrammatic plane, both because of the potent nexus between ideality, materiality and reality, and because of our ability to grasp and be grasped by concepts. Concepts remodel us as much as we model them.' from Patricia Reed, Xenophily and Computational Denaturalisation, in eFlux 2017, https://www.e-flux.com/architecture/artificial-labor/140674/xenophily-and-computational-denaturalization.

98   Horl, 'The Technological Condition.'

99   Markus Miessen, Crossbenching: Toward Participation as Critical Spatial Practice (Berlin: Sternberg Press, 2016).

displaced soil in the form of artificial mounds, the resettlements, the expansion zones and the future filling of the mine into an artificial lake. In particular, all these conditions share the progressive individualisation that has traversed the idea of land, suppressing the form of collectivity that the Common Forest created.

If the unity in which the Forest stood with the surrounding villages can resemble the Pangea, the force of modernity provoked its continental drift. Therefore, these scattered conditions represent a crystallisation of the implicit disposition that has created them, feedback looping the progressive individualisation that supplanted the Common Forest and therefore imprinting on the territory the shift from the Garden to the Machine. However, the same phenomena are simultaneously relics of the Forest: the displaced soil that forms the artificial mounds is the one on which the Forest stood; the urban, human or social 'asset' of the resettled villages is the same that used to enclose Die Burge; the expansion zone and its conflicts instead are caused and inflamed by an actual relic of the Forest. The following section will engage with all these conditions, analysing their spatial configurations as active-forms.
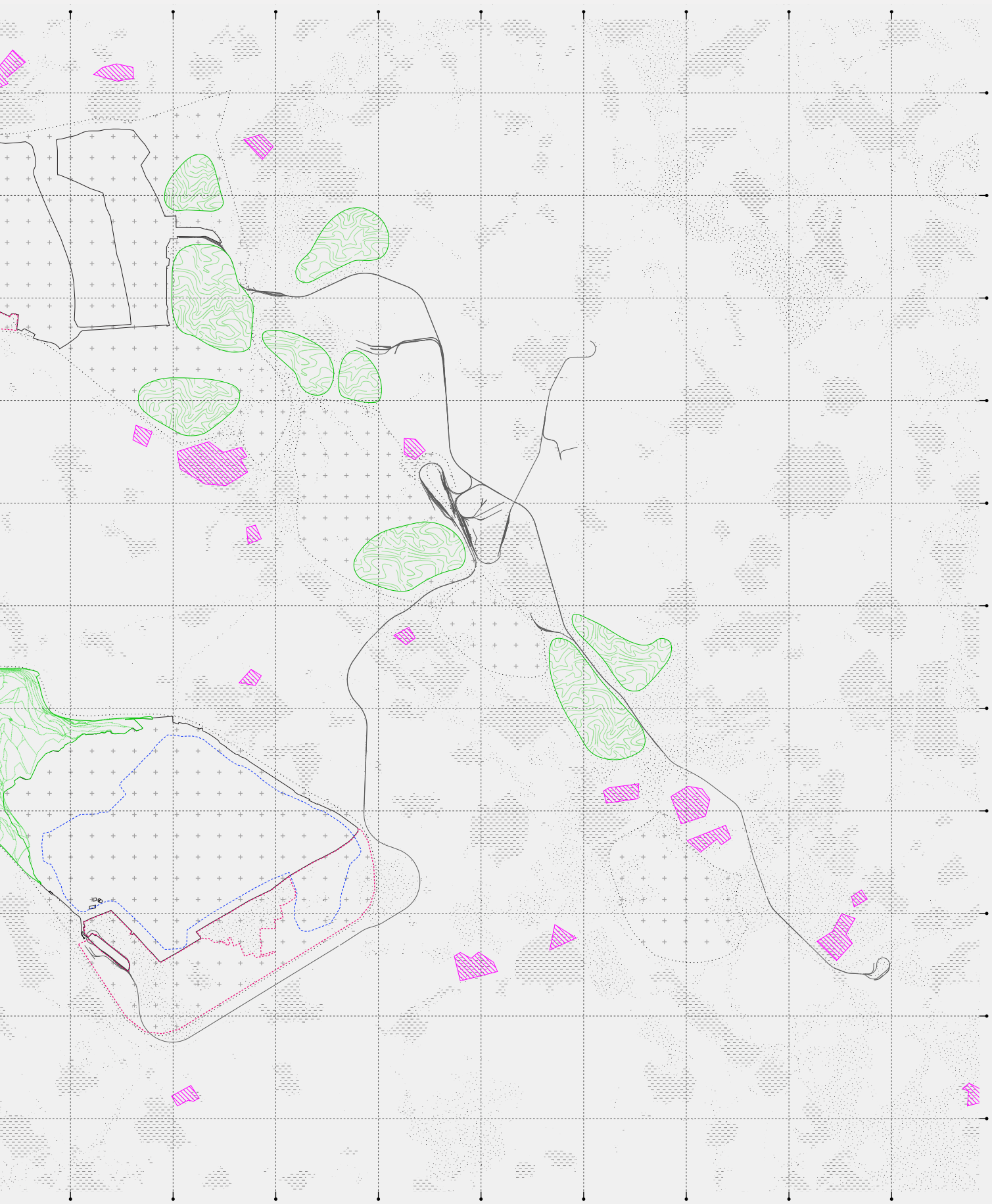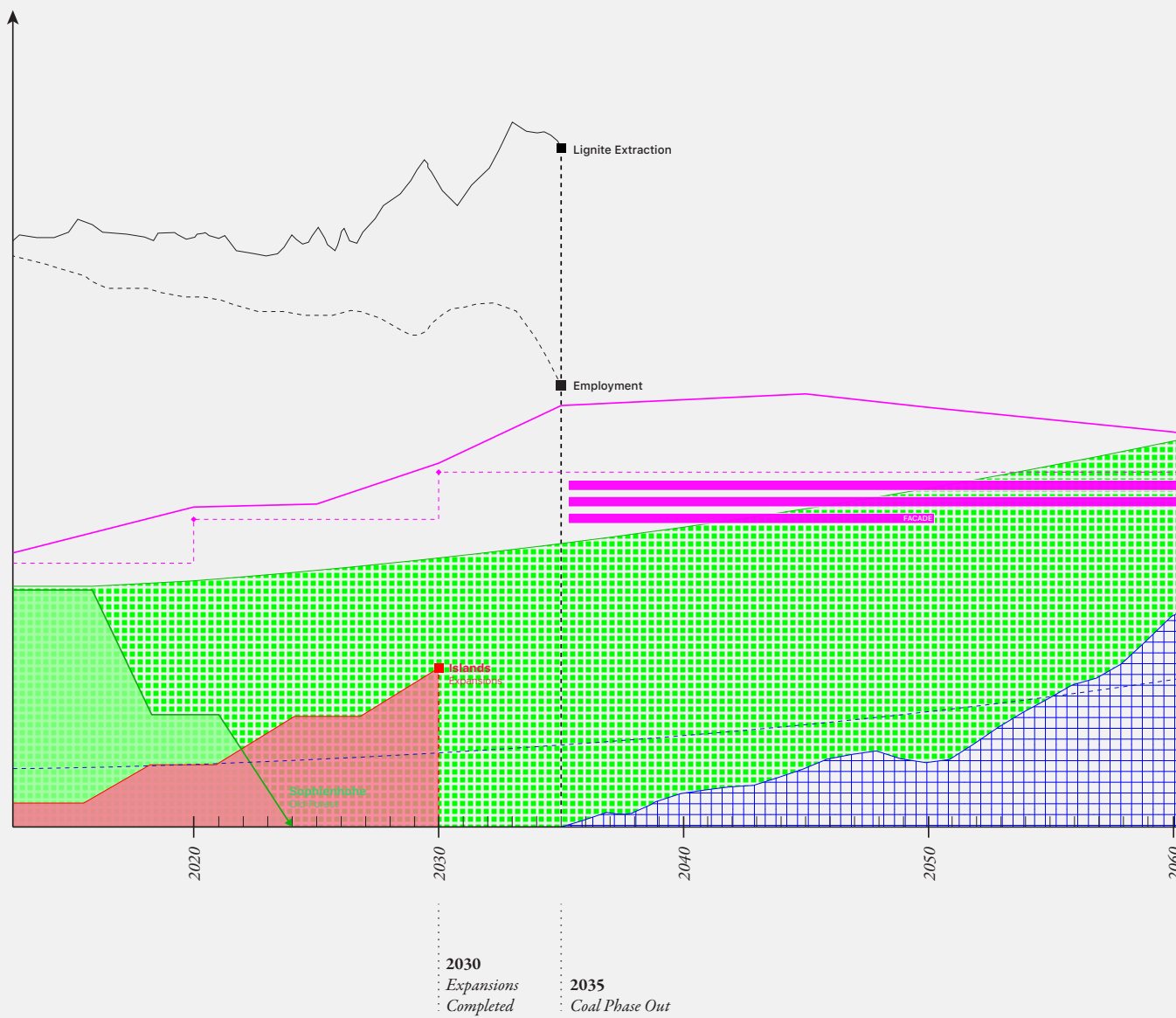
Forma

Crystals, Relics

Crystals, Relics. drawing by author.

5 Km

Lignite Extraction

Employment

Islands
EXPANSION

FACADE

Sophronhne
EXPANSION

2020   2030   2040   2050   2060

2030
*Expansions
Completed*

2035
Coal Phase Out

Crystals, Relics: projected evolution in the next 100 years. drawing by author.

Future(s)
Lake Filling

Sophienhohe
Naturalisation of Artificial Mounds

Neu-
Number of Villages

URBAN INFRASTRUCTURE

STRUCTURE

Neu-
Population

2070

2080

2090

2100

2080
New Lake Developments

2100
Lake Filling Completed
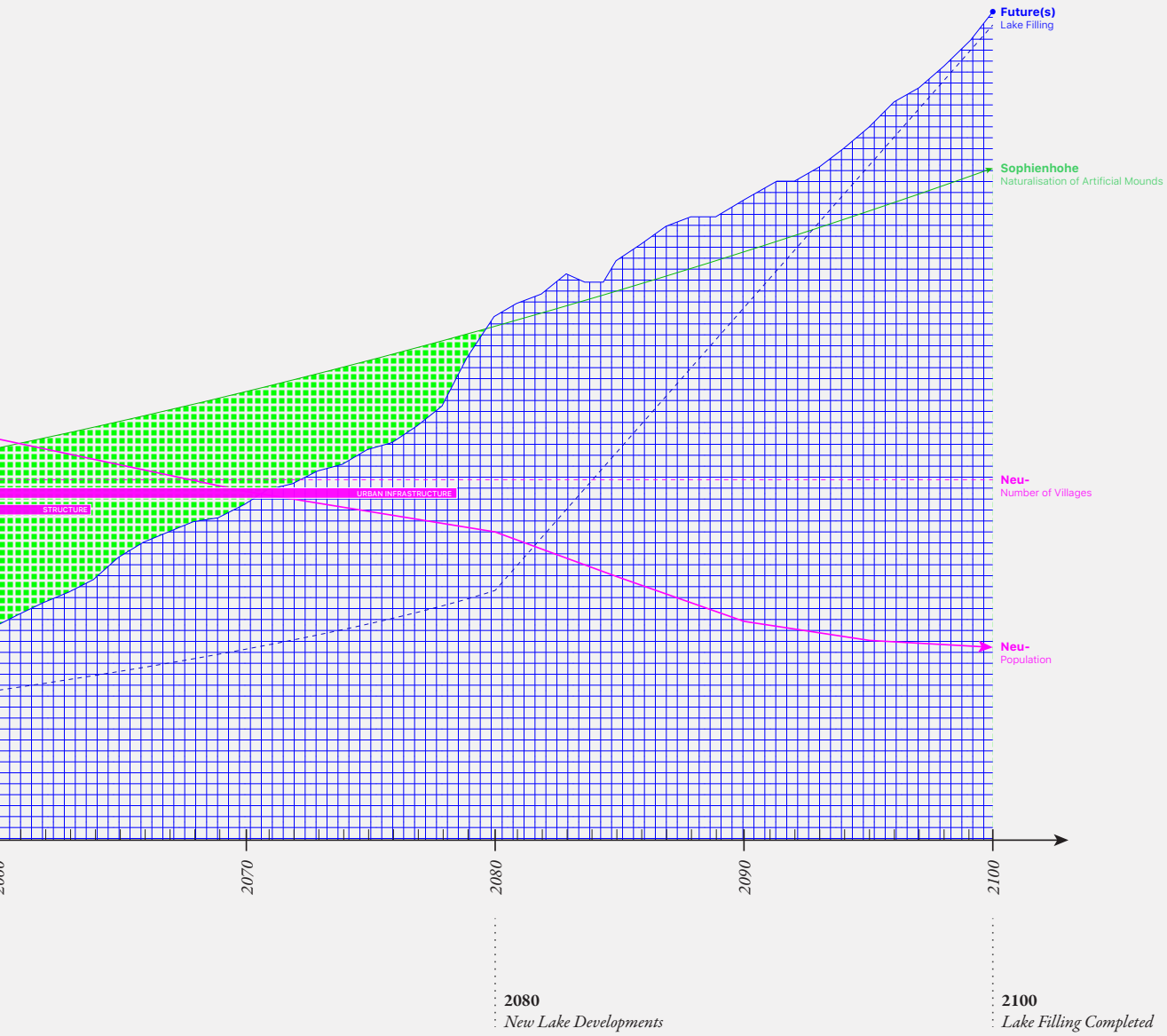
Resettlements×

Over the course of the last 40 years, the expansion of the mines has swept away anything on its path. These expansion have produced the abandonment and subsequent demolition of villages which has led to the continuous displacement of the residents into newly built expansion at the outskirts of the remaining urban settlements. This process has been repeated multiple times over the course of these years and it is generally preceded by a certain timespan in which negotiations between the residents and the company are held. Usually, the company calculates the value and size of the property and provides a new home of analogous value within a newly built settlement. Such a quantitative approach does not account for the affective values. In fact, one of the residents, inter-viewed by DW, has affirmed that 'not everything has a price tag'[100]; the man's property is a 100-acres farm listed as a protected site, and it is not yet sure if his land will be invested by the mine expansion.

100. Elian Hadj-Hamdi, 'The battle for villages and forests in Germany's coal country', DW, 2017.

An existing town in the process of being demolished.

Resettlements.

101. Koolhaas et al., Country-side.

Many criticisms have arised from the residents regarding the quality of the new houses: made of prefabricated components, the neu-Settlements are a collection of perfectly similar suburban houses with a front garden and separated by fences. The details could not be cheaper: a policy of minimum expenditure is visible from the doors to the gray metallic fences usually used for chicken breeding.[101] Next to the remaining towns, these impersonal suburbia have been built in the minimum time-frame possible as 'annexes' - and lack any sort of collective facility or public service: the result of a market-driven economy. On the other hand, the 'authentic' towns were inhabited by farmers and slowly became, from the Fifties onwards, home for the workers that used to be employed in one of the different places of the lignite extraction - mines, coal-tracks or at the power plant. In these, the modest appearance of the red brick-cladded residences reveals a clear picture of the care and wealth of the Welfare state of post war Germany. Some of the areas in which the authentic towns used to stand have already been demolished but not yet excavated: here a rustic tombstone - or just a pile of rocks - signals the name of the village, the year of foundation and the one of demolition.

Each of these small villages, scattered on top of patterns of agricultural land, were a tiny constellation of public infrastructures - schools, public squares, religious buildings; the demolitions did not affect only the residential areas, but swept away these civic buildings as well. The Catholic churches - in some cases of historical value, have been substituted by modern, flat buildings whose quality in details is comparable to the aforementioned housing developments. One of the last of these demolitions affected the church of St. Lambertus in Immerath - locally known as Immerath Dom (the Cathedral).[102] The Dom had existed at least since the 12th century - expanded several times
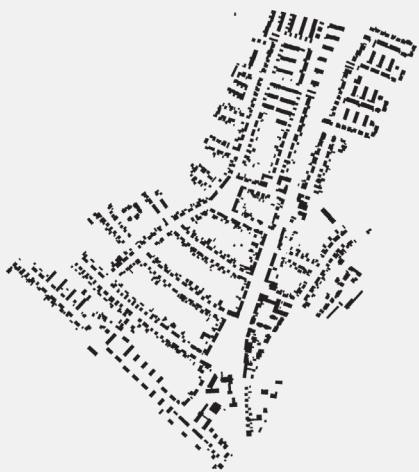
102. Hadj-Hamdi.

CRYSTALS, RELICS

FORMA

Resettlements.

left: the Immerath Dom being demolished.
right: tombstones inaugurates the resettlements.

Resettlements.

1 Km

before being completely torn down and rebuilt by local people in 1891 in a Romanesque revival style. Although the village of Immerath had already been demolished, the Dom was still standing alone surrounded by the foundation traces of the nearby buildings. Although the building was protected because of its interiors - a patchwork of its transformations since the 12th century - the church had been deconsecrated in 2013 and finally demolished in 2018, in the midst of activists' and ecologists' protests. In other cases, like in Neu-Manheim, a new church has been built and, occasionally, only fragments of the original one - as an altar or a cross - are saved and relocated.
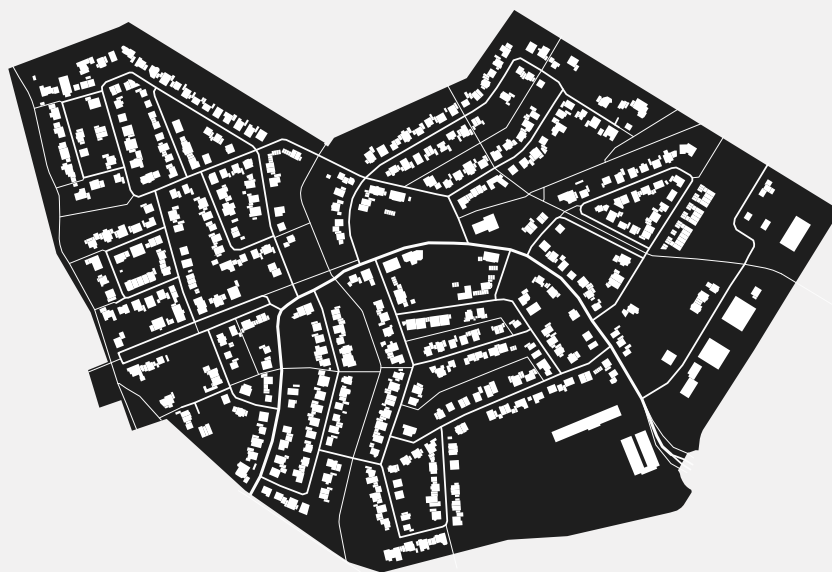
Manheim is one of the many examples of the extenuating procedures and long-lasting negotiations that have interested multiple villages around the three active mines. Recently, the southern expansion of the Hambach mine has interested the villages of Morschenich and Manheim. The procedures started in 2007; in 2015 the first houses started to be torn down - at a rhythm of fifty per year, while the first residents started to be relocated in the newly built Manheim-Neu. In the same year, a wave of asylum seekers from Iraq, Iran and Syria arrived in Europe, most of which reached western Germany. While the fate of the old Manheim appeared clear - in the silence of its empty streets and abandoned houses waiting to be demolished - the municipality started to rent out the vacant properties to around 220 asylum seekers.[103] Among all the German federal states, the region of North Rhine - Westphalia accounts for 21% of migrants registrations, being the Lander with the highest number of incoming migrants annually.

The empty streets of Manheim became the scenery of a paradoxical situation: during the time that the german population - mainly composed by elders -

103. www.land.nrw

Resettlements.

was moving out of town to reach their new and pristine residences, a population of young, often graduated, syrian and iraqi migrants is reviving the german village, occupying the traditional houses and having collective banquets in the backyard lawns. Collective festivities - multiplied by the number of different cultures that have moved in - have brought back to Manheim the serene spectacle of everyday life and have revived its rich postwar public infrastructure: schools and civic buildings become the backdrop of public events and gatherings for the newly settled population. Among these new residents, the majority has not been able to be employed in positions consonant to their studies and, thus, is committed to modest jobs in the nearby towns: some are hydraulic engineers that became plumbers, others electrical or mechanical engineers that became electricians, fixers, carpenters and masons. Often the new-comers engage in small maintenance work for the collectivity in Manheim - symbolic gestures rather than a pragmatic need, exorcising the state of uncertainty and the sound of the bobcats that signals the upcoming demolition. In this sense, the collective aura of the town, even after the desertion of its original residents, seems to have remained.[105]

105. Koolhaas.

Manheim-Neu. drawing by author.

Resettlements.

Typical Residential unit in Manheim-Neu. drawing by author.

Displacements×

As it has been mentioned before, RWE's agency is not secluded to the domain of the extraction operation, but it involves broader strategies to influence and legitimise its actions. In fact, if a recurring policy of RWE has been to promote biodiversity compensation against the destruction of the Forest, this logic has extended beyond his compensatory value (whose actual quality is and will be questioned) to, instead, reinforce and mask even more the extractive operations in the region. As it has been written: 'RWE makes two products: cheap electricity and pretty new landscapes'.[106] These pretty new landscapes are numerous in the region: forcefully picturesque and marketed reproductions of nature that make clear how during the last 40 years RWE has been leveraging his activities by enacting corporate policies on carbon and biodiversity offsetting, a tool for marketing its operations rather than real solutions for the region. Consequently, RWE's efforts for compensation lie in both more profit opportunities and territorializing power: the legitimation and normalization of coal mining, the power over not only the mining operations as an activity, but on the region entirely and its becoming through a 'social technology of governance'.[107] The latter is propagandized through the motto No-Net-Loss, as RWE promises to 'give back what it takes', promoting the restitution of everything that the bucket wheel excavators wipe away.

This policy is accomplished through violent acts of displacement: the excavated and discarded soil is placed back as an artificial hills and topographies, numerous today on the axis that connects Juchen and Kerpen; the aforementioned displacements of

106. Brock and Dunlap, 'Normalising Corporate Counterinsurgency.'
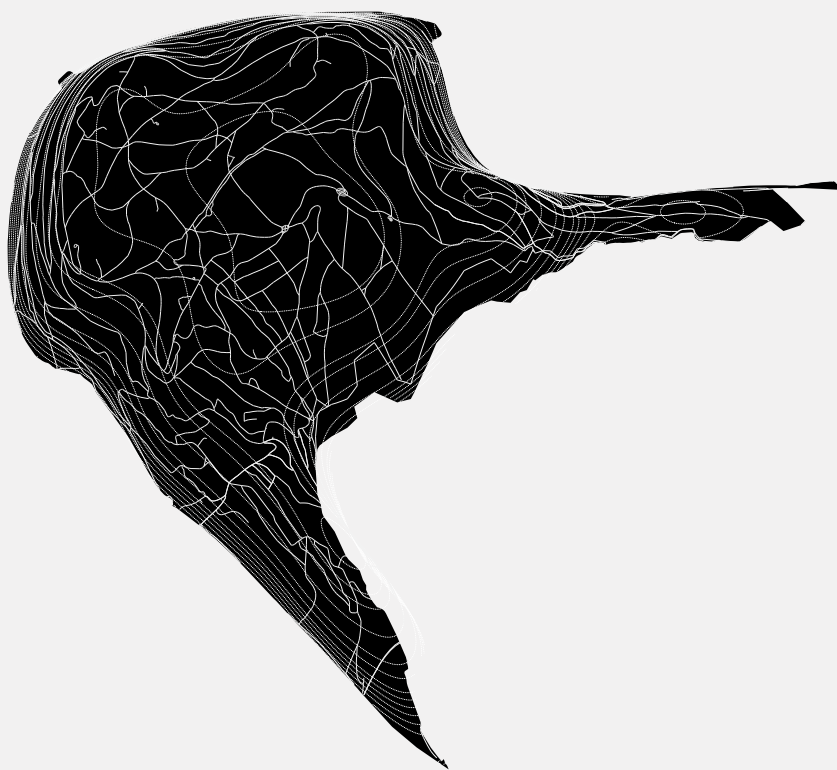
107. Brock and Dunlap.

Displacements.

town and villages is compensated with prefabricated house, usually annexed to existing and remaining towns as a sort of worker suburbia. The logic of offsetting states that both human and non-human costs can be compensated, that they can be compensated throughout the same logic. In fact, RWE has involuntarily equalized the social and the natural, considering them equal stocks that are possible to offset and replace endlessly. An 'ontological flattening' that, in order to work, is predetermined to quantify rather than qualify certain conditions, making it commensurable and therefore operating through reduction: 'the active process of reducing the multi-complexity and diversity of nature(s) to its easily quantifiable properties, in other words the hiding of complex social relations and uniqueness for the sake of domination, domestication, categorisation and quantification'.[108] It is a mechanism that relies on the abstraction and categorisation into hectares, sheer number of trees and habitat conditions: the flattening begins by topographically reducing to green, gray and brown surfaces and hatches that can be deleted and replaced as long as the net area remains the same.

108. Brock, 'Securing Accumulation by Restoration – Exploring Spectacular Corporate Conservation, Coal Mining and Biodiversity Compensation in the German Rhineland.'

Sophienhohe.

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Sophienhohe. drawing by author.

Displacements.

Alfred Hitchcock, Vertigo, 1957.

The Sophienhohe, the most prominent artificial hill that today is the largest worldwide (300m ALS), has been constructed with the excavated soil of the first six years of mining operations, and today is claimed by RWE as a success story in terms of creating a highly biodiverse habitat. On top of the overburnt earth, a layer of fertile topsoil has been set in place, probably imported from other sites, and hundreds of trees have been planted on it. Connected by 150 kilometers of trails, each of these meandering paths have its own name, punctuated by welcoming wooden signages whose carving indicate preferred routes for cyclists, hikers, casual passers that eventually lead to lookouts, improvised landmarks as a Celtic tree circle and parks.Here, RWE organises guided tours, regular events, annual meetups on recultivation and regeneration. In a way, Sophienhohe resumes pretty well the whole condition of the site: a displacement from the real to the fake and back again (in loops): more artificial than a mountain, yet more natural than a monument, this mound lies halfway between the two. In Rheinland, Sophienhohe becomes not only a product of the No Net Loss policy, but an active tool of spatial marketing.

Among the various elements scattered around the Sophien-hohe, roman milestone have been placed along an 'historical' path, although these have been displaced from another location.

Displacements.

109. Brock.

110. Gunnar Muller, 'Hambacher Forst oder Wald – Sprache entlarvt die Denkweise', 2018, https://www.goettinger-tage-blatt.de/Nachrichten/Politik/Deutschland-Welt/Hambacher-Forst-oder-Wald-Sprache-ent-larvt-die-Denkweise

110. Muller.

In fact, common to mining and other major infrastructural industries, biodiversity offsetting has been questioned as a 'neoliberalisation of conservation' that, through processes of alienation, actually extracts 'profit' from the aftermaths of capitalist accumulation. This wave of making-nature is founded on consolidating legitimacy while 'creating new symbolic and material spaces for capital expansion'.[109] It points at the creation of desire around ideas of wilderness, while following particular narrations about nature that spectacularize both the aftermaths and the activity of ecological repair as a given. The aforementioned maps and hatches create the illusion of a migrating mine or 'a hole that migrates in the landscape'[110] - as RWE promotes it - rather than an expanding mine - a legitimation of a maybe unpleasing yet due temporary use of the land, necessary to the creation of nature. It is an attitude that confuses the boundaries between the causes and effects, as it invisibilizes the multiform violences of the mining activity. The control over 'the map' - in a scale that transcends the human perception, promotes the mining activity as a sort of purgatory waiting for predetermined redemption.

This becomes particularly visible when considering a number of other strategic interventions that the company has set in place. A strip of wind turbines has been built that mediate the view with the promise of a greener future. Similarly, along a first displaced and then rebuilt high-speed road, RWE-sponsored 'trees of the year'[110] have been planted: these are supposed to mark the yearly effort of the No Net Loss policy, signaled by aluminium boards that carefully report - in a naturalistic looking font - the species of the tree and the year of planting. Both these strategies inflate the compensative efforts and directly point at influencing the scale of the viewer or the passer, while building landscape images that consolidate in the public opinion the responsible behaviour of the company.

This way to produce connections and relations imposes a sense of unity, prescribes into the minds of the residents, tourists and passers the promise of 'a better nature, a better future' - creating a confusing dialogue between the extractivist ruins and its eco-touristic future that will be expanded further. A better nature, a better future: not only a restoration effort, but the hubris to upgrade the native flora and fauna to meet touristic demands. Once the mining activity transcends its productive dimension and becomes a form of guardianship devoted to a whole territory where real and fake, natural and artificial, past and present mix and switch places continuously. Therefore the strategy behind these offsetting politics captures, steers and drives novel imaginaries, narratives, places and boundaries.

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Displacements.

Sophienhohe covered in fog.

Expansions×

Manheim and Manheim-Neu are today just seven kilo-
meter apart. A large highway that connects Aachen
to Koln runs East-West through the exact middle of
this distance and marks the limit of the future mine
expansion. The one that comprises the old village
of Manheim is just one of the three expansion zones
towards which the mines of Hambach, Garzweiler and
Inden will extend to. These expansions have already
started and are expected to be finalised within a span
of ten years, during which the demolitions of every-
thing on the soil of the designated area - villages,
infrastructures, forests - will take place.

Abandoned by the aging population of current and
ex-RWE workers, the Hambach expansion zone is
instead inhabited by the communities of migrants,
the ecologists that have occupied the other village in
the area - Morschenich - and that have squatted the
remaining of Die Burge - the old Forest. On multiple
occasions, this piece of land becomes a battlefield
between the ecologists and the North Rhine-West-

phalia police that tries to hold them back. The population is mostly younger than thirty, different etnies encounter each other, activity and movement is not restricted to work shifts, but can take place at any time of the day or night.The area, sheltered from the rest of the territory by that high-speed highway that prevents any direct visual and physical connection between the new and the old, has fostered a fertile ground for otherness where new and unexpected potentials come to the fore.

'*The German village, once the epitome of a stable local population, had become a space of unlikely amalgamations, a transitory zone where benign middle-class Danish girls, Iraqi farmers, underpaid Polish security guards hired by German electricity companies, depressed German car factory workers, anarchists, anti-terror brigades, environmentalists, yoga teachers, and gay Iranian piano players intersect.'* [112]

The uncertainty upon its future, together with the conflict between RWE's and the ecologists' interests and the latter's hope to slow down the expansion in time for the coal phase-out, seem to have given vent to the conflicts and the tensions that in the rest of the region seem instead repressed. The rules, routines and habits of the Rhineland's everyday life are here suspended: its disconnection and protection from what happens outside have therefore made it a state of exception, a laboratory for new forms of life.

112. Koolhaas.

Portraits of Activists squatting the remaining forest.

Expansions.

Tree-houses in the Forest.

Future(s)×

As the coal phase-out is approaching, the redevelopment of the whole site still waits for a clear direction while leaving space, instead, to a number proposals for its future. The most prominent one, proposed by RWE, is the transformation of the biggest hole in Europe into the biggest artificial lake in Europe. As a matter of fact, the company has promised to pump an extraordinary amount of water from the nearby Rhine into the pit in order to transform it into a tourist attraction. Stretching over an area of 4000 hectares, for depths of 400 meters, the new lake is going to require four billion litres of water and therefore this process, due to the limited amount of water that can be pumped, is expected to be completed by 2100.

In the meanwhile, residents are 'expecting rising property values and made promises of luxury apartments with lake views, touristic developments and new jobs'.[113]
Birdview renders - distributed by RWE - depict sunny scenarios where a coal and agricultural workers region

113. Brock, 'Securing Accumulation by Restoration – Exploring Spectacular Corporate Conservation, Coal Mining and Biodiversity Compensation in the German Rhineland.'

Future(s).

suddenly becomes an improvised polished, touristic and luxurious Venice Beach: a recreational lakeside with sailing yachts and regattas, rows of generous single-family houses while in the back hyper-techno-logical agricultural fields punctuated by solar parks and wind turbines complete the scenery. While waiting for the definitive closure and the new lake - whenever it might be - the inhabitants are invited to 'wait for the water' in the recently built Terranova, just at the edge of the mine: a multi-functional center (restaurant, bar, visitor center, gym) complete with sunbeds, artificial sand dunes and jetties stretching toward the future 'shore'.[114]

114. Brock.

The mine, at which one is doomed to stare from these sunbeds, do not wait for the lake: the mine has already become an attraction, as it has a TripAdvisor page (3,5 stars), and moreover regular tours around the mine are organized. Viewing platforms and towers, from which the machines can be seen in action, attract many visitors from Germany, Belgium, Netherlands, while 'energy safaris' on jeeps bring the tourists from the mine, to the coaltracks, to the power plants.

Numerous other proposals have followed the artificial lake: in May 2020 a large manufacturer of solar cells proposed to cover the surface of the mine and combine

the artificial lake with energy production. The solar cells, like nympheas, would float on the entire area of the future lake and produce 10 gigawatts - enough to compensate for the closure of all the existing coal-fired power plants. In the same month the proposals received positive feedback from both RWE AG and the Minister of Economic Affairs of North Rhine-Westphalia.

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left: **Lake**. Image by author.

Bibliography

Books.

Aureli, Pier Vittorio. The Possibility of an Absolute Architecture. Writing Architecture Series. Cambridge, Mass: MIT Press, 2011.

AAVV. ARCH+, The Property Issue: Politics of Space and Data, Birkhauser, 2020.

Bratton, Benjamin H. The Terraforming. Moscow: STRELKA, 2019.

Bryant, Levi R. Onto-Cartography: An Ontology of Machines and Media. Speculative Realism. Edinburgh: Edinburgh University Press, 2014.

Buchanan, Brett. Onto-Ethologies: The Animal Environments of Uexküll, Heidegger, Merleau-Ponty, and Deleuze. SUNY Series in Environmental Philosophy and Ethics. Albany: SUNY Press, 2008.

Canetti, Elias. Massa e Potere. Milano: Bompiani, 1990.

De Landa, Manuel. Assemblage Theory. Speculative Realism. Edinburgh: Edinburgh University Press, 2016.

Easterling, Keller. Extrastatecraft: The Power of Infrastructure Space. London: Verso, 2016.

Easterling, Keller. Medium Design: Knowing How to Work on the World. London: Verso, 2021.

Elden, Stuart. The Birth of Territory. Chicago: The University of Chicago Press, 2013.

Feenberg, Andrew, and Winner Langdon, eds. Technology and Democracy: Technology in the Public Sphere. Oslo: Senter for teknologi og menneskelige verdier, 1997.

Flam, Jack D. Robert Smithson: The Collected Writings. Berkeley: University of California Press, 1996.

Howells, Christina, and Gerald Moore, eds. Stiegler and Technics. Critical Connections. Edinburgh: Edinburgh University Press, 2013.

Ingold, Tim. The Perception of the Environment: Essays on Livelihood, Dwelling and Skill. London ; New York: Routledge, Taylor & Francis Group, 2011.

Koolhaas, Rem, Office for Metropolitan Architecture, AMO, Solomon R. Guggenheim Museum. Countryside: A Report, Taschen, 2020.

Martin, Timothy D. 'Robert Smithson and the Anglo-American Picturesque,' 2011, 11.

Marx, Leo. The Machine in the Garden: Technology and the Pastoral Ideal in America. New York: Oxford University Press, 2000.

Massey, Doreen B. For Space. SAGE Publications Ltd, 2012.

Mesch, Claudia, and Viola Maria Michely, eds. Joseph Beuys: The Reader. Cambridge, MA: MIT Press, 2007.

Miessen, Markus. Crossbenching: Toward Participation as Critical Spatial Practice. Berlin: Sternberg Press, 2016.

Morton, Timothy. Dark Ecology: For a Logic of Future Coexistence. Wellek Library Lectures in Critical Theory. New York: Columbia University Press, 2016.

Nye, David E. America as Second Creation: Technology and Narratives of New Beginnings. Cambridge, Mass.: MIT Press, 2003.

Parikka, Jussi. A Geology of Media. Minneapolis ; University of Minnesota Press, 2015.

Rossi, Aldo. L'architettura della città. 2°ed. Abitare, Quodlibet, 2012.

Scott, James C. Against the Grain: A Deep History of the Earliest States. Yale Agrarian Studies. New Haven: Yale University Press, 2017.

Sieper, Werner. 'Problems of the Bürgewald.' Dürener Geschichtsblätter, no. 26 (1960).

Simondon, Gilbert. On the Mode of Existence of Technical Objects, 2017.

Stiegler, Bernard. De la Misère Symbolique Vol. II. Paris: Flammarion, 2012.

Uexküll, Jakob von. Ambienti animali e ambienti umani: una passeggiata in mondi sconosciuti e invisibili, 2013.

Vishmidt, Marina, Boris Groys, and Metahaven, eds. Uncorporate Identity. Baden: Lars Müller Publ, 2010.

Wark, McKenzie. Sensoria: Thinkers for the Twenty-First Century, 2020.

Watkin, Christopher. Michel Serres: Figures of Thought, 2020.

Articles.

Aureli, Piervittorio. 'A Concise History of Gardens,' in ACCATTONE no. 6 (September 2019).

Brock, Andrea. 'Securing Accumulation by Restoration – Exploring Spectacular Corporate Conservation, Coal Mining and Biodiversity Compensation in the German Rhineland.' Environment and Planning E: Nature and Space, May 22, 2020, 251484862092459. https://doi.org/10.1177/2514848620924597.

Brock, Andrea, and Alexander Dunlap. 'Normalising Corporate Counterinsurgency: Engineering Consent, Managing Resistance and Greening Destruction around the Hambach Coal Mine and Beyond.' Political Geography 62 (January 2018): 33–47. https://doi.org/10.1016/j.polgeo.2017.09.018.

Corboz, André. 'The Land as Palimpsest.' Diogenes 31, no. 121 (March 1983): 12–34. https://doi.org/10.1177/039219218303112102.

Dorrestijn, Steven. 'Technical Mediation and Subjectivation: Tracing and Extending Foucault's Philosophy of Technology.' Philosophy & Technology 25, no. 2 (June 2012): 221–41. https://doi.org/10.1007/s13347-011-0057-0.

Grosz, Elizabeth. 'Deleuze, Ruyer and the Becoming-Brain.' Parrhesia: A Journal of Critical Philosophy, no. 15 (2012).

Horl, Erich. 'The Technological Condition.' Parrhesia: A Journal of Critical Philosophy, no. 22 (2018).

Iturbe, Elisa. 'Architecture and the Death of Carbon Modernity.' LOG Overcoming Carbon Form, no. 47 (2020).

Kleinherenbrink, Arjen. 'Territory and Ritornello: Deleuze and Guattari on Thinking Living Beings.' Deleuze Studies 9, no. 2 (May 2015): 208–30. https://doi.org/10.3366/dls.2015.0183.

Mantziaras, Panos. 'Rudolf Schwarz And The Concept Of 'City-Landscape' in Arquitectura, Ciudad & Tipologia Urbana, no. 22.

Sheller, Mimi. 'The Origins of Global Carbon Form.' LOG Overcoming Carbon Form, no. 47 (2020).

Simondon, Gilbert. 'The Genesis of Technicity'. eFlux (2017).

Smith, Daniel W. 'Flow, Code and Stock: A Note on Deleuze's Political Philosophy.' Deleuze Studies 5, (December 2011): 36–55. https://doi.org/10.3366/dls.2011.0036.

Smith, Daniel W. 'Review of Raymond Ruyer, Neofinalism.' Parrhesia: A Journal of Critical Philosophy 27 (2017): 116–28.

Tinnell, John. 'Grammatization: Bernard Stiegler's Theory of Writing and Technology.' Computers and Composition 37 (September 2015): 132–46. https://doi.org/10.1016/j.compcom.2015.06.011.

Van Daele, Galaad. 'We are Walking, Talking Minerals'. ACCATTONE, no. 6 (September 2019).

Additional Resources×

Newspaper Articles.

Anonymous. 'Größtes Loch', Der Spiegel, May 1977. https://www.spiegel.de/politik/groesstes-loch-a-b9bf7f26-0002-0001-0000-000040862560?context=issue.

Graham-Harrison,   Emma. 'Greta Thunberg takes climate fight to Germany's threatened Hambach Forest', The Guardian, August 2019. https://www.theguardian.com/environment/2019/aug/10/greta-thunberg-climate-change-fight-germany-hambach-forest.

Hadj-Hamdi,   Elian. 'The battle for villages and forests in Germany's coal country', DW, September 2018. https://www.dw.com/en/the-battle-for-villages-and-forests-in-germanys-coal-country/a-39964913.

Jäger,   Karin. 'Hambach Forest: Germany's sluggish coal phaseout sparks anger', DW, January 2020. https://www.dw.com/en/hambach-forest-germanys-sluggish-coal-phaseout-sparks-anger/a-52059845.

Muller,   Gunnar. 'Hambacher Forst oder Wald – Sprache entlarvt die Denkweise', Goettinger Tageblatt, September 2019. https://www.goettinger-tageblatt.de/Nachrichten/Politik/Deutschland-Welt/Hambacher-Forst-oder-Wald-Sprache-entlarvt-die-Denkweise.

Oltermann,   Philip. 'Activists try to stop autobahn being built through German forest', The Guardian, October 2020. https://www.theguardian.com/world/2020/oct/04/activists-try-to-stop-autobahn-being-built-through-german-forest.

Schauenberg,   Tim. 'As Germany phases out coal, villages still forced to make way for mining', DW, March 2019. https://www.dw.com/en/as-germany-phases-out-coal-villages-still-forced-to-make-way-for-mining/a-48017253.

Other.

Schumann,   Robert. 'The Schuman Declaration – 9 May 1950.' European Union, June 16, 2016.   https://europa.eu/european-union/about-eu/symbols/europe-day/schuman-declaration_en.

Fasbender,   Susanne. BRAND(FIRE): Lignite Mining in Germany and Hambach Forest, directed by Susanne Fasbender, 2018. https://vimeo.com/379217084?dnt=1.

Various historical and iconographic resources on Rhineland.

https://hambachforest.org/
https://www.heimatfreunde-niederaussem.de/
https://langen.ykom.de
https://www.rheinische-industriekultur.com/
https://www.rwe.com/nachbarschaft/rwe-vor-ort/umsiedlung/abgeschlossene-umsiedlungen
https://wisoveg.de

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