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- 1 Rooted in an ecologically destructive sectoral economy, post-mining territories bear the scars of unsustainable development, the effects of which have yet to be dealt with. As territories that are often heritagized and that have been both visibly and invisibly weakened, they offer contemporary settings where experimentation for the transition to a post-carbon society is particularly relevant. These metonymic symbols of a world in need of repair thus necessitate the analyses and contributions from following disciplines and research areas : landscape design, architecture and urban planning. How do we repair monofunctional territories ? In what ways do the tools of designers, architects, urban planners, landscape architects or artists contribute to this reparation ?

Reparation Through Reterritorialization

- 2 Mining is undoubtedly one of the most obvious displays of deterritorialization generated by industrial modernity. Its life cycle is dependent upon immediate returns, with no concern for added territorial value. The exploitation of the soil or the subsoil ^[26] which ceases upon resource deposit exhaustion or when its profitability limit is reached ^[27] transforms the topography, pollutes the soil and the groundwater, imposes all kinds of waste, disrupts existing landscapes and environments, and overcomes local economies. The establishment of a mining site is, above all, determined upon the location of resources (geological, energetic, etc.), thus developing according to its own logic, exogenously to any human settlements that were already present. The “spatial system of the mine”, made up of production equipment, essential access routes to the

mining operations and housing for workers, also tends to form a socially isolated sphere. For example, in 1952, geographer Max Sorre's analysis of the “physiognomic complex” of the Nord-Pas de Calais mining site described the simultaneous role of the “working community”, in reinforcing the unity of workers' estates, and the “moral divide”, created between proximate populations: “those from the mines and those from the villages, cities, and farms”. In general, mining estates have been extensively studied as distinct social communities¹.

- 3 By taking an interest in the future of territories with former mining operations embedded in their spatial, socio-economic, ecological, landscape or even aesthetic dimensions, the hypotheses put forth in this current issue address possible pathways for landscape and societal reparations, as well as the development of projects based on the specific communities and resources in a given territory.

Heritage, Environmental, Landscape, Architectural and Artistic Approaches

- 4 In this regard, the aim of this issue is to bring together some of the most recent international research contributions dedicated to post-mining transformations.
- 5 The state of the art shows that a multitude of research has been carried out on the subject, with great diversity in terms of approach. Heritage is an important issue today, as demonstrated by the inscription of several European mining sites (English, German, French, Italian, Spanish, Belgian, etc.) as Unesco World Heritage, or the existence of networks such as the European Mining Heritage Network. These procedures often consist of articulating the recognition of exceptional or already legitimized places and architecture with memories and material traces that are more ordinary, forgotten or neglected. In this context, as Marion Fontaine points out, mining heritage is the subject of “two contradictory temptations”: on the one hand, the erasure of physical legacies and industrial stigmas; on the other, the overvaluation and showcasing of “remains”².
- 6 Other approaches supported by the environmental sciences consist of implementing public policies for post-mining management by developing strategies and techniques for ecological rehabilitation, such as soil restoration (reforestation, land preparation for grazing, etc.) and the replenishment of biodiversity³.
- 7 In line with the environmental reparation objectives, landscape architecture research makes it possible to establish an intersection between landscape and environmental demands, as well as spatial planning processes and the role of the actors on the ground. Within the studies of landscape architecture and urban design, the landscape architecture approach is defined in a way that is both complementary to and out of sync with strictly environmental designs. Surrounding the concepts of recovering or reclaiming landscapes and “post-technological landscapes”, aesthetic dimensions are positioned as a foundation for bringing back shape, meaning and functionality to landscape design projects⁴.
- 8 To a certain extent, ethnographic and sociological works devoted to mining memories are situated at the interface of previous trends. By seeking to observe the uses and representations linked to history, the interest of these works is to amplify the voices of local communities which can then be used to reconstruct an identity, but also to show

the ambivalence underpinned by the memorial processes in a post-mining management context, between community resilience capacities and the survival of social conflicts⁵.

- 9 Finally, the actions of artists enrich all of these approaches by generating staggered views that open the door for the development of “alternative futures” through creative projects that emphasize land abuse, in order to raise societal awareness. As a system of political thought, ecology gives rise to artistic practices related to environmental issues, like reclamation artists⁶.

At the Intersection of Research and Design Project

- 10 Two lines of questioning are proposed in the call for contributions. The first focuses on the concept of landscape and its multiple facets, particularly cultural landscape in the heritage sense outlined by Unesco, inviting original views and approaches to post-mining reterritorialization.
- 11 The second seeks to highlight new ways of managing public goods, which can be brought about by design project processes linked to the post-mining future.
- 12 The eighteen article submissions received bear testimony to a wide variety of case studies, in terms of mining production or geographical and historical contexts. To name just a few : small-scale gold panning sites in the Kédougou region in the South-East of Senegal ; gold mining activity in Guyana ; historic mining of coal, zinc, lead and silver in the mountainous region of Iglesiente in Sardinia, Italy ; industrialization of the Upper Maremma Metalliferous Hills in Tuscany, Italy ; post-mining sites in Iran ; and lithium extraction in Chile. While the Nord-Pas de Calais Mining Basin is widely represented in this issue, this is due to the important place it holds in the geography of post-mining sites throughout the globe.

A Diversity of Territorial and Cultural Contexts

- 13 Among the seven articles selected, three focus on foreign mining sites and four investigate sites located in French territories.
- 14 Cécile Laly's article concerns the small Japanese Island of Gunkanjima, historically known as Hashima. Situated nineteen kilometers south of Nagasaki, it wasn't until the nineteenth century that settlements appeared on the island exclusively for mining purposes. Mitsubishi Company's purchase of the land in 1893 resulted in numerous planning operations to secure mining activities, expanding the island to three times its original size. Between 1920 and 1945, young Korean and Chinese people were brought to the island for forced labor. While the closure and abandonment of the mines occurred in 1974, it wasn't until the early 2000s that plans emerged to develop tourism on the site and to include it in the List of Sites of Japan's Meiji Industrial Revolution for Unesco World Heritage inscription, which was enacted in 2009. In this article, Cécile Laly examines photobooks produced by several Japanese and French photographers, both professional and amateur, dedicated to Gunkanjima and published in the service of its bid for Unesco World Heritage. The article revisits these photographic testimonies, dating from the 1950s to the early twenty-first century, retracing the history of the island, both before and after the closure of the mines. It shows how

photography is used as a tool in constructing a positive image of the site, despite its heritage being contested by South Korea.

- 15 In their article, Camilla Perrone, Maddalena Rossi and Flavia Giallorenzo explore an Italian mining site of about 1,700 ha, situated in close proximity to prestigious Tuscan landscapes, between Cavriglia, Figline and Incisa Valdarno. This historic coal mining site is owned by the Enel Group, which was initially created as a public institution in 1962, later becoming a stock company in 1992 and included on the stock exchange in 1999. Mining operations in the region began in the second half of the nineteenth century and ended in 1994. In the mid-twentieth century, Enel constructed a thermoelectric power plant that is still in use today, and also secured part of the Santa Barbara mining site in Cavriglia. In 2017, the company launched the Futur-e program, with the aim of defining a strategy for the future of mining sites in Italy. The article retraces the socio-territorial evolution of the old Santa Barbara mining site, describing the design process which involves the University of Florence and the Polytechnic University of Milan. This landscape is becoming a social and economic driver, while also supporting a new post-mining regeneration narrative. The authors analyze the relationship taking shape between the private company Enel, the local community, the municipalities and the research centers of the universities involved. In this article, the landscape design project, which is centered on energy production and tourism, is a component that reveals the relationships between private and public actors as well as the involvement of local residents and organizations.
- 16 The majority of the articles question the reconversion processes of Western European coal mining landscapes in a context of mass deindustrialization.
- 17 The inherited mining landscapes of Lower Lusatia, the primary lignite mining region in Germany, are the subject of an article by geographer Michel Deshaies. These open-pit mining operations began during the nineteenth century and intensified throughout the twentieth century, coming to represent over 70,000 ha in 1990 before collapsing after reunification. The article focuses on tools for rehabilitating the heavily degraded environments of these brownfield sites through the creation of forest and lake landscapes (reforestation of large areas, flooding of residual pits) and the implementation of wind and photovoltaic infrastructure. In retracing processes for the creation of second-hand nature, along with the valorization of industrial heritage and the development of renewable energy, Michel Deshaies focuses his analysis on the social, economic and environmental issues linked to the construction of these new landscapes. This is done through studies carried out during the International Building Exhibition (IBA), founded in the 2000s to enhance the growing regional attractiveness for tourism. Supplemented by interviews conducted with residents and actors involved in the development of new design projects, this analysis thus provides evidence for the systematic erasure of remaining traces of mining operations (which aren't immediately visible), along with a re-appropriation of the site by local populations who had long been excluded from it.
- 18 The article by Georges-Henry Laffont and Luc Rojas is dedicated to the Ondaine Valley, in the Saint Etienne Mining Basin. The magnitude of these coal mining operations in the second half of the nineteenth century was primarily in service of the needs of the local metallurgical industry. Regional dependence on coal mining and industrial operations thus maintained mining activity throughout the region until the closure of the last pits in 1983, more than twenty years after the decision was made to shut them

down. Based on archives and photographic recounts, the article combines the analysis of an architect and a historian to propose a “reasoned inventory” of the still detectable traces of mining activity in the landscapes of the three main communities in the valley. It then aims to position the depicted landscape sequences in relation to local imaginations and political strategies.

- 19 Three articles are dedicated to the Nord-Pas de Calais region in France. As the only mining site to have been designated Unesco Heritage on this scale, this territory holds an important place in the geography of post-mining sites throughout the world. The coal mining operation, which began in 1720, is 10 kilometers long from East to West, with a width of twelve kilometers and a depth of up to 1.2 kilometers. The site was fully configured by the end of the nineteenth century, then nationalized in 1944, its activity lasting thereafter until 1990. Following a period marked by a desire to erase this history, its bid to become a Unesco World Heritage Site emerged in the 2000s. In 2012, the site ended up being selected as a living and evolving cultural landscape, remarkable for its continuity and homogeneity. Although the World Heritage status does not include the entire mining site, 109 separate components of the area account for 1,200 heritage elements, such as workers' estates and mining villages, slag heaps, health and community facilities, religious buildings, mining pits and headframes. It highlights an industrial landscape shaped by humans, and thus cultural, but also evolving insofar as it was constructed in successive steps until completely disrupting a once rural and agricultural territory. Inhabited today by 1.2 million residents, it is also recognized as a living landscape which must undergo new changes. The issues between the renewal of the territory and the preservation of memory, the landscape and the built environment are explicitly mentioned in the three articles of this issue. As a land of immigration, a stage for workers' struggles, and a site of large-scale coal extraction, it thus leaves behind a remarkable memorial and physical heritage that is the subject of numerous research projects, notably conducted by geographers, sociologists, artists, landscapers and architects. The Mining Basin Mission, a tool for engineering, land-use planning and development, has been the institutional management partner of Unesco World Heritage since 2013 and plays a major role locally, as demonstrated by the three articles in this issue. All three deal with issues of planning and its negotiation between the different territorial institutions that are engaged in local politics in the region.
- 20 In their articles, Patrick Céleste, as well as Lucas Monsaingeon and Philippe Prost, draw on the operational experience they have developed over several years in this mining region as architects and urban planners ; the former as an architect-consultant for governmental departments, elected officials, social landlords and private individuals ; the latter having been involved in action-based research carried out since 2017 for the Mining Basin Mission, identifying urban pressures and protecting the outstanding universal value of this Unesco World Heritage Site. Integrated within the roles of actors and institutional and political processes, the analyses they propose call for a typo-morphological approach. Their attention focuses on mining estates in particular, which are considered as “the living part of the basin”, to show their “capacities for resilience” (P. Céleste) and to question the transformational challenges of a “lived and inhabited heritage” (L. Monsaingeon et P. Prost).
- 21 It is these same mining estates that interest Camille Mortelette, this time from the point of view of the inhabitants and their perceptions of the Unesco World Heritage status. Their analyses of the daily constraints that this heritage status places on

residents' and their use, maintenance and transformation of the housing is based on interviews with different samples of mining site residents as well as institutional actors. More broadly, this article examines the mechanisms for promotion and communication deployed by the Mining Basin Mission, in order to associate local populations with the heritage process.

Responses to Reparation Processes : Transformation, Updating and Reconciliation

- 22 The notion of reparation put forth in the title of this issue finds particular relevance in post-mining settings. These overexploited, abandoned territories, now left as brownfield sites, are of interest to researchers who see an opportunity in questioning the tools for seizure and transformation. The seven articles in this issue allow us to define three categories of reparation : reparation through transformation, reparation through updating and reparation through reconciliation.
- 23 Reparation through transformation sees the landscape as a planning tool, capable of founding new sources of economic development, particularly through tourism. The challenge thus consists of reconvertng these territories by supplying them with new productive functions, thereby compensating for material losses. Depending on the case, tourism appears as a value with the capacity to either erase the mining image or to better understand it. In the case of the former lignite mines in Lower Lusatia, Michel Deshaies deconstructs the processes of transforming mining landscapes into landscapes of touristic “mining succession”. In the small community of Cavriglia, Tuscany, Camilla Perrone, Flavia Giallorenzo and Maddalena Rossi retrace processes of reterritorialization within the Santa Barbara mining site through socio-economic development and ecological metabolism, taking tourism as the aim of the project. In both cases, the development projects involve private landowners. Energy production from renewable sources is also highlighted as an element of economic development.
- 24 Updating heritage can similarly be understood as a form of reparation, to which architectural and urban approaches contribute. If an example can be seen in the International Building Exhibition (IBA) of Lower Lusatia studied by M. Deshaies, this approach is especially explored in the articles by P. Céleste, L. Monsaingeon and Ph. Prost, whose analyses question the notion of a “living and evolving” heritage in the regional characteristics of Nord-Pas-de-Calais.
- 25 All three therefore insist upon the necessity to render heritage interventions as levers for territorial planning projects rather than empowering them. By retracing the palimpsest process on which the mining basin is built, P. Céleste focuses on issues of “coherence” in planning initiatives. One of the indirect functions that he attributes to Unesco World Heritage recognition is repairing a territory that continues to be fragmented by contemporary forms of urban planning. All three thus question the right scale of intervention, also highlighting the interest of typo-morphological analyses which, by reconsidering mining estates in their formal characteristics, seek to show the resilience of this ordinary heritage : regulated land division, as well as the distribution system and the spatial organization of mining worker’s land use (house, yard, garden, garage...), revealing an overall coherence based on repetition. Typo-morphology therefore makes it possible to construct a critique of urban fragmentation and architectural diversification processes using external examples as models.

Heritage recognition then becomes the starting point for a “change of view” based on the coherence of the urban fabric and architectural types. For P. Prost and L. Monsaingeon, this procedure goes so far as to offer heritage monitoring tools capable of guaranteeing the outstanding universal value of this territory. They thus wish to demonstrate that to live in a place of heritage presupposes a certain relationship to space and time, considering the buildings, materials or uses over the long term, while the World Heritage status often remains perceived as a point of struggle for those who live in the territory.

- 26 This twofold problem, that of mining legacy management over time based on representations shared amongst actors, is at the heart of G.-H. Laffont and L. Rojas' article. Their exploration of the landscapes of the communities in the Ondaine Valley lead them to reconstruct the history of interventions that today give understanding to the traces of the mining industry's past as a “permanent game of invisible and visible”. Their contribution highlights the emphasis placed on the role of “territorial imaginaries” (of the modern city, technical engineering or even social struggles) and on the sometimes-conflicting articulations in the responses to post-mining planning developments, between erasure and heritage. It is also interested in considering the economic, political and social history being constructed since the end of coal mining activities, in attempts to make up for the disappearance of mining, to mitigate traumas and even to “compensate the people”. In this sense, G.-H. Laffont and L. Rojas prefer to address “remediation” rather than reparation.
- 27 Repairing for historical reconciliation is the third pathway explored in the articles by Cécile Laly, Camille Mortelette. These articles question the contradictions that heritagization processes may reveal between a social mining memory and a desire to value mining remains. Cécile Laly questions the links between the Unesco World Heritage selection policy, photographic representation and political reconciliation (between South Korea and Japan), as well as between images that bear witness to both a happy world and the tragic history of human oppression.
- 28 Camille Mortelette distinguishes between heritagization processes : that of social tools aimed at the local population and tourist development tools for outsiders ; that of the upward movement of forming mining worker organizations to preserve the memory of their former work, doomed to disappear, and the downward movement of protecting sites deemed iconic, due to their architectural and aesthetic characteristics. By deciphering the mediation efforts carried out by the Mining Basin Mission (festivals, artist residencies, etc.), the author questions a possible reconciliation of the population with its past and its territory, but also more broadly the emancipatory dimension of heritage certification in the face of the constraints imposed upon inhabitants in their daily life.
- 29 In conclusion, the articles that comprise this current thematic issue highlight the interest in raising questions about the future of mining territories. The historical and memorial robustness made apparent in these articles serves as justification to go beyond these disciplines (especially environmental sciences and knowledge established in architectural, urban and artistic design) and scales (from the mine shaft to the larger territory), in order to reveal the topography (from subsoil to slag heaps, from natural soil to processed soil).
- 30 Action-based research experiments were clearly requested in the call for articles with the idea of mobilizing architectural, landscape or even artistic and literary exploratory

approaches based on the cultural resources of the territories and co-production processes. Some authors have succeeded in undertaking the challenge of reconciling research processes and reparation proposals, taking a critical step back in the face of more operational positions.

- 31 A remaining fact is that the role played by local communities in the (re)construction of spatial awareness and in the development of a local design projects deserves to be the subject of a thematic issue in itself. Doing so would place the inhabitant at the center of the post-mining territorial transformation process. In becoming a process of social construction, and no longer just a technical practice or a process for economic transformation, the reparation initiatives would take on a whole new meaning, favoring tools for projects carried out in collaboration with the local community as well as participatory techniques.

NOTES

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3. See also *Journal of The American Society of Mining and Reclamation*, [on line] <https://www.asmr.us/Publications/Journal-of-the-ASMR>
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