Residual Governance. How South Africa Foretells Planetary Futures

by Gabrielle Hecht (2023) Durham, Duke University Press, 288 pp.

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It is rather unusual for an academic book to display a title which is extremely evocative and yet able to fully capture its original theoretical contribution. *Residual Governance* by Gabrielle Hecht is a marvelous book which focuses on the strategies used by mining companies and South Africa's governments to (not) manage the various kinds of waste and hazardous substances produced by mining activities. Historically entangled with apartheid and its correlated urban and political development, residual governance emerges throughout the book both as a technopolitical strategy of modern racial capitalism and as an accelerant of the Anthropocene, hence providing a strong conceptual framework for addressing contemporary planetary dynamics. Professor of History at Stanford University and President of the Society for the History of Technology, Gabrielle Hecht has extensively written on mining waste, radioactive residues and pollution in Africa. These long-standing research interests are well reflected in the book, which draws on an astonishing set of different sources. Interviews with scientists, community leaders, activists, journalists, urban planners and artists are combined with the archival work and fieldwork conducted by Hecht in South Africa over the last two decades. Moreover, pictures, graphs, images and maps pop up throughout the chapters to enrich and substantiate Hecht's analysis. The book is divided into five thematically articulated chapters, which also allow Hecht to piece together the history of South African mines and their residues, from the late 19th century until the most recent attempts to deal with waste dumps.

Chapter One moves across several perspectives, from planetary history and hominids' technical skills and settlements to the evolution of racial legislation and the current state of Johannesburg piles of rocks, where southern African women and men are engaged in artisanal mining. In doing this, the chapter introduces the theoretical lines which are further developed in the following chapters. Hecht emphasizes how the common characteristics of residues (accretion, irreversibility, unruliness) as well as the size of the piles, the extent of the dams and the volume of the voids created by extraction make mining waste a "super-wicked problem" (Levin et al. 2012), one which requires multiple scales and entry points. She hence describes the concept of residual governance as a conceptual tool bringing together three different dynamics: 1) the managing of discarded materials; 2) governance as a residual activity

TECNOSCIENZA. Italian Journal of Science & Technology Studies
15(2) pp. 185-188 ISSN 2038-3460
DOI: 10.6092/issn.2038-3460/21238

which deploys simplification, ignorance and delay as tactics; 3) the treatment of people and places as waste. Additionally, the chapter highlights how the labor practices and infrastructures developed by the mining industry from the late 19th century set the ground for the racist legislation of the following decades and for the "apartheid algorithm" (Mpofu-Walsh 2021) which still shapes South African society. The chapter ends by illustrating the deep entanglement between gold, uranium and radon contained in a block of Rand rock. While the former represented the reasons of the shifting but persisting interests around the Rand, the radioactive elements contained in them and then dispersed in the water, in the air and in the dust caused several kinds of hazards to the citizens living in the area.

Chapter Two describes the scientific, political and legislative problems caused by the drainage of acid mine wastes into the region's water source. Particularly, when the poisonous materials (arsenic, lead, mercury) and toxic residues contained in the water started to affect farmers' fields and animals, studies commissioned by mining companies and governmental bodies revealed the health and environmental harms caused by water pollution and uranium contamination. However, the production and circulation of reliable knowledge about water pollution was one of the major issues faced by citizens. On the one hand, mining companies relied upon one of the core strategies of residual governance, manufactured ignorance, to keep secret the results of those studies, or to generate scientific uncertainty about them. On the other hand, the complexity of contamination required scientists and activists to look for answers and for knowledge which was not available yet. Particularly, what emerged through the studies was the specificity of each ecosystem which, due to its history, characteristics, and human relationships, had to be studied on its own terms. Accountability was another thorny issue. By the time the hazards were recognized, most of the mines had shut down, leaving the new democratic government to deal with the toxic residues and with crucial questions: who had to be held responsible? Who had to pay for the remediation plan? Within this context, regulatory standards, guidelines and best practices became increasingly urgent, but also another field influenced by the interests of corporations.

Chapter Three shifts the focus from water and cavities to dust, sand and dumps. Often compared to pyramids or mountains, dumps had their own, faster temporality of erosion, which made dust difficult to control but also posed a politically complex heritage issue. The management of the dumps, however, reflected the financial interest of the mining companies: at first, dumps were grassed and mine lands used for residential or urban purposes; later they began to be seen as piles of cheap uranium. The chapter touches upon another relevant point, the spatial character of residual governance. In this regard, the unwholesome entanglement of corporations' minimalist management, racist urban planning and untamable toxic material is superbly described in one of the first pages of the chapter:

> Aboveground dust, mine companies hoped, would simply dissipate into the air. But with hundreds of thousands of miners working the seams, the mountains rose so rapidly that the winds couldn't disperse the residues fast enough, or far enough. Dumps dominated the landscape and defined the contours of city planning: Black housing downwind, white housing upwind. (p. 86)

Chapter Four outlines the history of struggle and resistance of inhabitants of "temporary" settlements around mine shafts against residual governance. Hecht documents the lack of basic forms of governmental support, housing, and employment that affected township communities both before and after the attempts at reconstruction of the post-Apartheid era. An absence that left communities to deal with poverty, pollution and violence on their own. The scientific compartmentalization of accumulated measurements made it difficult for scientists to produce the necessary evidence to move governmental and industrial agencies to address the exposure risks of shaft settlements. The lack of access to education made it hard for locals to engage with scientific results, turning the case into a matter of international alliance with external experts. When the situation became an international case, struggles ensued between inhabitants, police and governmental agencies. Regulatory frameworks ultimately left to individuals to enforce their own protection from exposure, moving tailings posed considerable hazards, and forced relocations did little to improve the lives of workers, transforming the struggle into "a battle of repetition and attrition" (p. 161). Against the compartmentalization of science and the multiplication of corporate subsidiaries to stall progress and deflect responsibility claims, the protests did not distinguish demands for decent housing, clean water and healthy food. It was the entanglement of soil, water, buildings, and bodies that, after all, produced the hazards experienced by the population.

Chapter Five presents some of the "toxic afterlives of South Africa's zombie mines" (p. 164) in the context of post-Apartheid land remediation and housing projects. It weaves data that display land injustice with the bureaucratic and legal struggles to address it, alongside photographic projects that represent and problematize informal mining activities around closed mine sites. Dreams of remediating land injustice through housing programs were hampered by the industrial secrecy of geological data and the confusing complexity of environmental legislation. These residual combinations threatened to reproduce Apartheid-era marginalizations of poorer communities into toxic lands. The studies by the Gauteng City-Region Observatory, a social science think tank founded in 2008 that was supposed to help in the strategic governance of mine lands around Johannesburg, further showed the lack of public engagement by leaders of megaprojects in housing and water treatment. The chapter thus calls into question the meaning and methods of democratic participation under capitalist regimes and the blindness of future-oriented projects to existing systemic inequalities.

Hecht's *Residual Governance* engages with long-standing STS debates: racial technopolitics (Cumming 2018), the intersection of chemicals, technical expertise and regulations (Boudia et al. 2022), the strategic production and circulation of ignorance (McGoey 2012). This last topic is especially relevant, as Hecht highlights how various forms of ignorance have contributed to maintain and reproduce corporations' minimalist approach to mine residues, but also how citizens and activists struggled to obtain the knowledge needed to support their claims. In recent years, ignorance studies have shown the generative and intentional production of ignorance across different domains and have highlighted the different forms of ignorance (Roberts 2015). In this regard, the book provides an exceptional variety of types of manufactured ignorance: reports disappearing or put under embargo and contested for using supposedly unrecognized methodologies; recommendations for action not shared with municipal authorities. Even more importantly, the book illustrates what ignorance *does* (Mica et al. 2021) and how it shapes technopolitical action but also people's possibilities of resistance.

STS scholars might find *Residual Governance* precious and highly inspiring for at least two main reasons. First, Hecht concludes the book by highlighting how the notion of residual governance can be scaled up to address global, planetary futures. Far from being unique, the localized dynamics so carefully described by Hecht are conceptually relevant for enquiring about the broader processes that have been shaping the Anthropocene and the environmental and racial impacts of technopolitics around the planet. Second, the book is methodologically and stylistically inspiring. Theoretical analysis and detailed historical reconstruction are punctuated with the voices, actions and artworks of the people who fought against the violent nature of residual governance. Some chapters are written in a style reminiscent of investigative journalism, assembling a heterogeneous variety of materials and sources that try to build a coherent narrative. Their connections to residual governance might therefore appear uneven at times. This aspect raises methodological questions about the inherent tensions between descriptive vividness and theoretical robustness that are hard to avoid, especially in projects of this scope and magnitude.

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