

City University of New York (CUNY)

## CUNY Academic Works

---

Publications and Research

CUNY Graduate Center

---

2013

### Global Futures and Government Towns: Phosphates and the Production of Western Sahara as a Space of Contention

Mark Drury  
*CUNY Graduate Center*

[How does access to this work benefit you? Let us know!](#)

More information about this work at: [https://academicworks.cuny.edu/gc\\_pubs/285](https://academicworks.cuny.edu/gc_pubs/285)

Discover additional works at: <https://academicworks.cuny.edu>

---

This work is made publicly available by the City University of New York (CUNY).  
Contact: [AcademicWorks@cuny.edu](mailto:AcademicWorks@cuny.edu)

# Global Futures and Government Towns: Phosphates and the Production of Western Sahara as a Space of Contention

Mark Drury

City University of New York,

557 Franklin Avenue #3, Brooklyn, NY 11238 U.S.A.

*The study of natural resources lends itself to theorizing the politics of nature and the politics of time. The space of Western Sahara, where both remain highly contested, provides an opportunity to consider the ramifications of resources in political conflict at different historical moments. Drawing from environmental histories of North Africa and the Sahara, as well as the anthropology of time, the author focuses on two historical moments. The first, from 1945 to 1976, concerns the discovery of phosphate deposits during the Spanish colonial period and the implications of this discovery for political authority in the Sahara more broadly. The second, contemporary moment is characterized by intensifying interest in plotting the future use and reserves of phosphates, with potential implications for the political futures of Western Sahara. These two moments are considered in three parts: the first situates the discovery of phosphates in Western Sahara within the regional process of decolonization; the second considers the configuration and reconfiguration of an urban space, Laâyoune, during these two moments of phosphate production; and the third discusses the contemporary dynamics of determining the future of phosphates in the present.*

*Keywords: decolonization, environmental imaginary, natural resource, phosphate, resource-making project, crisis, Western Sahara, El Aaiún/ Laâyoune*

*L'étude des ressources naturelles permet de théoriser les politiques de la nature et de la temporalité. Dans l'espace du Sahara occidental elles sont toutes les deux très contestées et permettent alors de saisir la place des ressources durant les différentes phases d'un conflit politique. En se basant sur les trajectoires environnementales de l'Afrique du Nord et du Sahara, ainsi que sur des anthropologies de la temporalité, l'auteur cible deux périodes historiques. La première, qui s'étend de 1945 à 1976, concerne la découverte de gisements de phosphates pendant la période coloniale espagnole et ses implications pour l'autorité politique au Sahara au sens large. La seconde concerne la période contemporaine ; elle est caractérisée par un intérêt accru pour la planification des utilisations ultérieures des réserves de phosphates, et de leurs conséquences pour le futur politique du Sahara occidental. Ces deux périodes sont analysées en trois parties : la première positionne la découverte des phosphates du Sahara occidental dans le processus régional de décolonisation ; la seconde examine la configuration et la reconfiguration de l'espace urbain de Laâyoune pendant ces deux périodes de production de phosphate ; et enfin la troisième cerne les dynamiques contemporaines déterminant le futur des phosphates.*

*Mots clés : décolonisation, imaginaire environnemental, ressources naturelles, phosphate, projet d'exploitation de richesses naturelles, crise, Sahara occidental, Laâyoune*

The geopolitical space of Western Sahara, carved out of the north-west coast of Africa and allocated to Spain during the Berlin Conference of 1884, is currently defined as a non-self-governing territory, its legal and political status the subject of an ongoing dispute. The broad outlines of this dispute have remained largely unchanged since the Spanish withdrawal in 1976: Morocco has claimed—and, since the 1990s, effectively occupied—the region of Western Sahara, but lacks international legitimacy; Sahrawi nationalists, led by a group known as Polisario,<sup>1</sup> maintain a nation-in-exile in UN-run refugee camps on Algerian territory; a Sahrawi resistance movement within Moroccan-occupied territory persists; and the United Nations remains peacekeeping steward to a stalled process of decolonization that has now lasted for more than three decades. From colonialism to international law to armed combat to the definition of Sahrawi identity itself, the history of Western Sahara is marked by a shifting locus of conflict.

The presence of natural resources has constituted yet another terrain of struggle, as phosphates, fishing rights, or the prospect of oil have become prominent at various points in the history of the conflict, both before and during decolonization. As Akbarali Thobhani (2002)<sup>2</sup> illustrates, however, the significance of these resources remains the subject of debate:

Some argue that Morocco took over Western Sahara and is determined to hold onto the territory because of its mineral and fishing resources. This author is among those who believed this to be the case. However, after completing this study, I no longer share this opinion. It is the author's view that Morocco would have taken over the territory even without these resources. The power of the ideology of "Greater Morocco" or the recuperation of perceived lost territory was just too intense (Thobhani 2002, 260).

From one perspective, the presence of resources fails to explain Morocco's occupation of Western Sahara; from another, mineral and fishing resources constitute the underlying cause of territorial conflict. Based on a material–ideational dichotomy, this framework separates the political from the economic and the ideological from the material in an attempt to identify the primacy of one motivating force over another.

This dichotomy shapes studies concerned not only with the origins of the conflict but with its evolution over time. Stephen Zunes and Jacob Mundy provide a more nuanced perspective, without disregarding the

role of natural resources—in this case, phosphates—at different points in time: “Although phosphates do not sufficiently explain Morocco’s desire to seize Spanish Sahara, they now provide Morocco with ample motivation to hold on to it” (Zunes and Mundy 2010, 35). In this way, they introduce a question of temporality: When do certain natural resources become important in the Western Sahara dispute, and what might that tell us about the shifting terrain of struggle? Despite this important distinction, Zunes and Mundy remain embedded in an analytical framework of motivation and causality, ultimately privileging nationalist ideology over material resources in order to explain the conflict’s intractability: “Although economic motivations have changed over time, ideational and political rationale have remained constant” (Zunes and Mundy 2010, 35). In separating the territoriality of resources from the ideology of nationalism, the works of Thobhani and of Zunes and Mundy reproduce a historiography of Western Sahara shaped by this material–ideational dichotomy:

Should the origins and continuation of the conflict be explained in terms of nationalist ideology (Zunes and Mundy 2010; Damis 1983; Thobhani 2002) or in terms of the struggle to control material resources (Shelley 2004; Thompson and Adloff 1980; Zoubir 1998)?<sup>3</sup>

As a point of departure, this false choice creates two restrictions. First, the choice between resources and nationalism naturalizes a certain scale of analysis: material resources either are or are not the primary factor motivating nation-state actors. While an analysis of Morocco, Algeria, or Polisario as nation-state (or, in the case of Polisario, nation-state-like) actors informs certain aspects of the conflict, focusing exclusively on this scale risks overlooking a variety of other dynamics involved in producing Western Sahara as a space of contention. Why, after all, begin with nation-state actors to understand a geopolitical space that defies resolution into a territorial nation-state? Beginning with the processes surrounding resource production, on the other hand, makes scale itself a matter of analysis. Fernando Coronil’s study of oil production in Venezuela is instructive in this regard:

Since what is socially significant in the case of natural resources is how the material properties of these resources are made to matter by the network of social relations woven around them, this focus should lead to an examination of the spatial structures and political units produced in this process of producing and distributing wealth (Coronil 1997, 41).

Rather than isolating the resource as an independent variable in the calculus of nation-state politics, Coronil’s social geography provides an

important framework for directing our attention toward the political configurations produced by and mediating the effects of a given resource, from the global division of nature to the social spaces that form around sites of resource extraction.

Drawing on the literature of global political economy, this article examines how a specific resource, phosphate rock, has influenced the production of Western Sahara as a space of contention. In focusing on the specific qualities of phosphate production, I am not suggesting that the presence of phosphates necessarily makes the territory of Western Sahara an object of struggle. Nor do I focus on phosphates in order to suggest that this mineral, over and above other resources, has been particularly decisive in prolonging the conflict. Given the relationship between phosphate rock (which is used in producing commercial fertilizer) and agriculture, this particular resource is, not unlike oil, tied to an energy regime that is global in scope. As a result, situating resource-making within the global politics of nature helps to illustrate the intersection of different resources with a variety of political formations, including their integration into global regimes of governance (Peet, Robbins, and Watts 2011). Considering this resource as a set of relations configured over time, rather than strictly as the material object of territorial struggle, also provides an opportunity to rethink the political practices and events enabled by a given resource (Mitchell 2011). And, finally, attending to the particular history associated with the regional landscape from which the resource is extracted—in this case, the Sahara—helps to understand the “environmental imaginaries” that mediate between changing energy regimes and the political projects they engender (Davis and Burke 2011).

The second restriction created by the material–ideational dichotomy concerns the processes through which natural resources become politically significant. The conventional geopolitical approach shaping the study of Western Sahara implicitly assumes that resources constitute latent wealth that is both constantly present and presently scarce, and therefore the object of endless struggle. Whether phosphate rock, cephalopods, or petroleum prospects, this perspective reduces natural resources to an unchanging, ready-made form—the commodity. But, as Elizabeth Emma Ferry and Mandana Limbert point out, resources do not exist ontologically prior to the historical, social, and political processes that produce them as such. Rather than treating the resource as an already formed commodity, Ferry and Limbert suggest that “resource-making projects” entail a variety of different temporal processes (Ferry and Limbert 2008, 15). As these processes intersect with different collectivities’ expectations and uncertainties about historical change, these resources become associated with a certain temporal sensibility (Limbert 2010). As an anthropology of resources and time, this approach draws

our attention both to the moments in resource-making when a given resource becomes politically significant and to the historical moments when this occurs.

Drawing from environmental histories of North Africa and the Sahara, social geography, science and technology studies, and the anthropology of time, I will focus on two historical moments. The first moment, from 1945 to 1976, concerns the discovery of phosphate deposits during Spanish colonialism and the implications of this discovery for political authority in the Sahara more broadly. The second, contemporary moment is characterized by intensifying interest in plotting the future use and reserves of phosphates, with potential implications for the political futures of Western Sahara. These two moments are considered in three parts: the first situates the discovery of phosphates in Western Sahara within the regional process of decolonization; the second considers the configuration and reconfiguration of an urban space, Laâyoune, during these two moments of phosphate production; and the third discusses the contemporary dynamics of determining the future of phosphates in the present.

### **Part I: Colonialism and the Transformation of Political Authority**

While Spanish Sahara had been under colonial rule since 1884, Spain's presence well into the 1930s consisted almost entirely of a handful of coastal military garrisons engaged in limited interactions with fishing groups along the coast. In this sense, the nomadic and pastoral groups traversing the desert landscape were only nominally under colonial rule (Rézette 1975). From the late 1940s onward, however, when one of the world's largest phosphate deposits was discovered at Bukra', some 110 km inland, the locus of Spanish colonial rule in the Sahara shifted away from the coast. The construction of the Bukra' mine marked a period from the end of World War II until the end of Spanish colonialism in which "the coast has been replaced, as the zone of conflict, by the inland boundary" (Mercer 1976, 15). At the centre of this contested zone, Bukra' produced not only phosphate rock but a nearby city, Laâyoune, that housed both an expanded colonial administration and a growing Sahrawi<sup>4</sup> nationalist movement.

This trajectory is captured in a condensed manner in the chapter title "Minerals and Social Change," from Tony Hodges' authoritative history of Western Sahara. Hodges (1983, 130) suggests that out of the Bukra' mine "a Sahrawi working class was being born" and that from this inchoate social formation, a nationalist movement developed. Rightly, then, the trajectory from the discovery of phosphates in the late 1940s to the opening of the Bukra' mine in 1972 has been connected to tremendous

transformations in the region. The connection between phosphates, modernization, decolonization, and nationalism, however, may not be quite as linear as Hodges' history suggests. Samir Amin (1994, 17) treats the post–World War II period as a cycle between the demise of European imperial capitalism and the consolidation of neo-liberal global capitalism when alternative political projects were possible in the Third World. Building on Amin's insight, Gary Wilder (2012; in review) provides an understanding of decolonization as not simply the transfer of power from the colonizer to the colonized but a moment of restructuring when a number of different political futures seemed possible. From this perspective, the nation-state form based on rigid territorial sovereignty was not the only possible outcome of decolonization, even if significant pressures may have structured the end result of this process.

The period between the discovery of phosphate and the Spanish withdrawal from the region, 1945–1976, includes the opening of the Bukra' mine in 1972 and corresponds with Amin and Wilder's moment of restructuring. In what follows, I suggest that phosphate mining in Spanish Sahara might be better understood by situating its effects within a regional context of decolonization of the Sahara that was quite fluid. Certainly, the introduction or intensification of industrial mining during this period entailed infrastructural investments that rapidly integrated the region into global capitalism. But post–World War II interest in regional mineral and petrochemical wealth also contributed to shifting political boundaries and increasingly indeterminate political units as capital investments in the Sahara intensified. Consequently, the political units and social spaces produced by mineral wealth during Spanish colonialism are part of a broader intersection between extractive industries in the Sahara and decolonization across the region (Trumbull 2011).

In common with the historicization of many natural resources,<sup>5</sup> the history of phosphates in the Sahara typically begins with an account of discovery. Discovery is constituted not only as a starting point in Western Sahara's transition to modernity but as an event saturated in contingency. This is the origin story of phosphates in Western Sahara: in 1945, a Spanish geologist named Manuel Alia Medina collected samples from the flat, hardpack desert *hammada* of what was then Spain's colony. According to one account, Medina originally intended to use the samples to date the sediments and rock formations, until, subsequently, "it occurred to him to test the specimens for phosphate content" (Mercer 1976, 184). When lab results yielded extraordinarily high phosphate levels, Medina's survey became the point of convergence for colonial expansion, capital investment, and expert knowledge. The emphasis on discovery supposedly isolates the moment of contingency when a natural resource is made to matter by chance: "since the late fifties, Western

Sahara had experienced belated but rapid changes, due to the sudden awakening of interest in its mineral resources” (Hodges 1983, 151). But why did the “sudden awakening” in Western Sahara’s minerals come about when it did? The contingent nature of discovery, and its emphasis on individual decisions, obscures what could be broader, more structural processes at work in making natural resources matter at different points in time.

Colonial interest in developing the Sahara predated World War II, as the desert’s geography gave rise to numerous military campaigns, development plans, and exploratory travel accounts in both Spanish Sahara, on the Atlantic coast, and French Algerian Sahara, to the east. Imagined in terms of both untapped wealth and a uniformly unforgiving natural environment, 19th-century schemes for the Sahara varied widely, but were consistently utopian (Brower 2009). Fascinating and disturbing as these schemes were, George Trumbull (2011, 88) points out that French colonial planning for the Sahara “operated as much at the level of the spectral as the speculative.” Late-19th-century capitalist ventures along the northwest coast of Africa that predate Spanish colonial rule help to illustrate this point. In an effort to tap into trans-Saharan trade and circumvent French control over North African ports, the Scotsman Donald Mackenzie established a trading station where the African coast approaches the Canary Islands at what is now Tarfaya, Morocco (then known as Cape Juby). Mackenzie’s North West African Company was successful enough, from 1880 until its liquidation in 1896, to concern imperial competitors, including the French, whose ambitions for control over Morocco were intensifying. Nonetheless, this London-based corporation failed to fulfil the broader ambitions outlined in its charter, which included the aim “to obtain grants or concessions for the opening up and making, and to open up and make, or cause to be made, a road or roads, or a canal or canals from Cape Juby aforesaid or its neighborhood into the interior of Africa” (Mackenzie 1880, n.p.). Mackenzie’s mercantile venture exemplifies earlier colonial imaginaries of the Sahara as a space to be transected, rather than a source of wealth in itself.

If these 19th- and early-20th-century projects failed to connect with circuits of capital to effectively transform the social geography of the region, their entanglement with colonial rule helped to continually produce new administrative units and shifting political boundaries. The baroque history of French border making in the Sahara during Algerian and Moroccan colonialism illustrates this point particularly well. Before Morocco became a French Protectorate in 1912, the French Algerian border was left largely undefined, frequently measuring administrative control in anthropological (i.e., tribal) rather than geographic terms. In 1930, with Algeria and Morocco both under French control but

administered through separate regimes,<sup>6</sup> the French government established the Confins Algéro-Marocain (CAM) in order to facilitate joint military action, respond effectively to anti-colonial resistance, and control transportation routes (Beslay 1993). With the military problem coordinated, CAM continued shifting administrative units between French Algerian colonial administration and the Moroccan protectorate well into the 1940s.

The 1950s, however, marked a turning point in French administration of the Sahara, characterized by a renewed need for border clarification:

In the late 1940s extensive mineral prospecting began in the CAM. In 1952–53 manganese was found in large quantities on the southern edge of the Hammada of the Guir and in 1953 huge iron deposits were discovered at Gara Djebilet, near Tindouf. In January 1954 plans were made for oil exploration near Tindouf ... and so, in order to assure French access to minerals in the Saharan border regions, the protectorate authorities decided to shift Morocco's "presumed" southern border northward in 1953 to what came to be known as the "Trinquet Line" (Hodges 1983, n. 29).

Between mining and oil prospects and burgeoning independence movements in Morocco and Algeria, French efforts to retain some control over the Sahara took on greater desperation, and grandeur, generating a national debate that lasted throughout the decade. Couched in terms of "fraternité" (Belime 1951) and concern for Saharan peoples as national minorities, as well as a conception of the Sahara as an empty space with untapped resources (Boilley 1993, 221, 230), the debate focused on two options: either a unified territorial entity under French control—concepts included *l'Afrique saharienne française* and *Territoire national du Sahara*—or a deterritorialized zone for economic investment (Boilley 1993, 218). The discovery of oil in the Algerian Sahara in 1956 led to the creation the following year of the Organisation commune des régions sahariennes (O CRS), a kind of "transcolonial" administrative region forged out of the contiguous areas of the Sahara under French control, which decolonizing nation-states could join (Kouzmine et al. 2009, 671). The O CRS dissolved following Algerian independence in 1962, having produced very little of substance during its existence (Boilley 1993, 230; Kouzmine et al. 2009, 674).<sup>7</sup> Despite its brief and ultimately unsequential existence, the debates in France that led to O CRS illustrate how an "environmental imaginary" (Davis and Burke 2011) of the Sahara as an empty space with untapped resources generated a variety of political projects at a historically specific moment, such that the region became "the site of empire's final interventions" (Trumbull 2011, 106).

French designs on the Sahara leading up to and during decoloniza-

tion remain similar to 19th-century utopian schemes such as Donald Mackenzie's in at least two respects: they were never realized, and they depended upon a conception of the Sahara as an unpopulated expanse of potential wealth. There was, however, a qualitative shift in European colonial environmental imaginaries of the Sahara after World War II, as we see in Hodges' (1983) description of mineral prospecting in the late 1940s. Whereas an effort to tap into trade routes (trans-Saharan) or populations (as a latent workforce) generally oriented 19th-century imaginaries of the Sahara, post-World War II development of the Sahara envisioned the territory itself as a store of wealth. With this environmental imaginary in place, the imperative for carefully demarcated borders developed in tension with French attempts to construct new administrative units that would encompass the Sahara in its entirety. In the process, political authority of the Sahara shifted decisively from a relation between people to control over territory, understood in terms of abstract (and, increasingly, valuable) space. The resulting institutionalized border ambiguity is important for understanding why territorial sovereignty remains highly contested as a basis of political authority in Western Sahara and across the region (Joffé 1987, 2010).

For vast regions of Spanish Sahara that were only nominally under colonial rule well into the 20th century, colonial presence in the Sahara was becoming less spectral as speculative capital investments in the region intensified. Colonial discourses imagining the Sahara as a store of wealth connected with circuits of capital to produce significant transformations to the social geography of the region after World War II. With an influx of capital occurring at the precise moment when colonial sovereignty was on the wane, social transformations were taking place in the Sahara amidst tremendous upheaval in the basis of political authority. If, as Amin (1994) and Wilder (2012) suggest, decolonization was a moment of political economic restructuring more generally, then the decolonization of the Sahara produced a particularly fluid and contested political space. This radical indeterminacy was reflected, at least in part, in the political significance attributed to minerals such as phosphates in Spanish Sahara, and in uncertainty over the political and social spaces produced by these extractive industries.

*The "Government Town"*

The Saharais cheer themselves through life with a saying:  
"What does it matter if the way is long, provided there is a well  
at the end." But for many it is a mine that awaits them  
(Mercer 1976, 184).

Though the Spanish investment in the Bukra' phosphate mine took place in the midst of tremendous political transformation, it had very real effects in increasing the presence of Spanish colonialism through the expansion of two sets of infrastructures. The first, built with financing from French, German, and American companies as well as from the Spanish state, the colonial mining agency Empresa Nacional Minera del Sáhara SA (EMINSA), provided the equipment for extracting, transporting, and shipping phosphates from the inland deposit of Bukra'. Excavation machinery at the open-pit mine included excavators and trucks. On the coast, a desalination plant was built to clean the phosphate rock, as well as warehouses for storage and a jetty for loading the mineral onto ships. To link the mine with the port, a conveyor belt was also built—reportedly the longest in the world, at 97 km—which transported excavated phosphate from Bukra' to the coast (Mercer 1976, 186; Hodges 1983, 126–27).

The second infrastructure might be thought of as the human infrastructure tied to the social spaces that developed around the Bukra' mine. One of the most useful analytic tools for understanding how extractive industries produce and transform social space is a spatial structure often characteristic of mineral or petrochemical extraction: the company town. The company town is distinguished by the fact that it is exclusively owned by a single concern and that, as a result, its urban space operates entirely according to a single rationality of serving the mine. As Kaveh Ehsani (2003) points out in an essay on Iranian cities built in the mid-20th century by the Anglo Persian Oil Company, the company town in fact follows two principles that can be seen as both contradictory and complementary. The first, fairly evident, principle involves worker housing sufficient to ensure the social reproduction, and also the social assimilation, of the labour force. The second principle requires the control and domination of a subjugated people (Ehsani 2003, 391–2), often through different “technologies of hierarchy” that separate populations according to housing and hiring practices (Vitalis 2007, 269).

The colonial administration in Spanish Sahara applied one of these “technologies of hierarchy” in hiring Sahrawis only for unskilled labour at the Bukra' mine, but, like most extractive industries, Bukra' depended on a relatively small labour force to remain operative. Upon opening, the mine employed some 2 620 individuals, the majority of whom were Spanish labourers from the nearby Canary Islands (Hodges 1983, 130). Given that worker housing at the Bukra' site was modest, and remains so today, it would be misleading to assume that the labour conditions of the mine constituted the locus of anti-colonial struggle. Phosphate mining was, of course, generative of broader social and political transformations in Spanish Sahara, but very few of these changes took place within a

classic mining camp or company town.

Rather, an expanded urban and bureaucratic infrastructure accompanying the Bukra' installation produced a range of new behaviours and ways of living that can be traced in two ways: to changes in anti-colonial resistance, and to the expansion of Laâyoune, a settlement some 110 km north of the mine that became the colony's administrative capital. In the late 1950s, when Morocco had decolonized and Algeria was waging a war for independence from France, many Sahrawis engaged in struggle with colonial forces through the Harakat at-Tahrir, or Liberation Army. Thousands of Sahrawis were involved in this movement, which was sponsored—but not entirely controlled—by the Moroccan government and carried out guerrilla attacks against French and Spanish colonialism in southern Morocco, Spanish Sahara, the Algerian Sahara, and northern Mauritania between 1956 and 1958. Following the movement's ultimate defeat by a joint French–Spanish counterinsurgency, an estimated 12 000 Sahrawis ended up settling in southern Morocco, northern Mauritania, or south-west Algeria; the number grew to 50 000 over the next decade (Mercer 1976, 223; Hodges 1983, 150). What distinguished this movement was that it was broadly anti-colonial without necessarily being nationalist. With the Bukra' phosphate mine and the accompanying expansion of Spanish colonial rule to Laâyoune during the next decade and a half, Sahrawi anti-colonial struggle became both more localized and explicitly nationalist.<sup>8</sup> The rapidly expanding administrative centre of Laâyoune was the focal point of this struggle; the first protest of its kind took place in a public square in the city in 1970, and protests intensified until Spain withdrew from the colony in 1976 (Zunes and Mundy 2010, 103; Thobhani 2002, 45–50).

This shift in the locus of political struggle in Spanish Sahara occurred along with the growth of Laâyoune as an administrative capital. As many Sahrawis left a fully pastoral or nomadic way of life during the late 1960s and early 1970s, thanks to the confluence of expanded urban infrastructure, colonial administration wage labour, and an extended drought, Laâyoune became a rapidly expanding urban centre:

El-Ayoun, where there had been little more than a military post and a few *khaimat* and shacks in the fifties, was gradually converted into a real town, with a population of over 40,000, one-third Spanish, by 1974 (Hodges 1983, 130).

Though its growth was undoubtedly an effect of phosphate mining, Laâyoune was not so much a company town as an outgrowth of the expanded colonial infrastructure and administration built to accompany a newfound investment in the control of population and territory. In this sense, phosphate mining generated, or at least served to legitimate, the

construction of an urban infrastructure meant to transform the social relations of a much broader swath of Sahrawis than those involved in mine work alone. In doing so, the paradigmatic social and political space in the Sahara was less a “company town” than a “government town,” with all the infrastructure in place not simply to socialize Sahrawis into wage labour but to socialize them into serving as subjects of the Spanish Sahara.

As mentioned above, certain defining elements of the dispute over Western Sahara have remained in place since Spain’s withdrawal from the region in 1976. This is not to say, however, that the social geography of the region has remained unchanged since the end of Spanish colonialism. Since the construction of berms in 1987 fortified its territorial gains in a war with Polisario, Morocco has effectively occupied most of the former Spanish colony. This *status quo* has been reinforced by the UN ceasefire established in 1991. Despite the fact that Western Sahara’s sovereignty remains unresolved, the ceasefire conditions have made it feasible for Morocco to invest in regional development, contributing to a new phase of transformation in the social geography of the region, some 30 years after Spanish colonialism (Thobhani 2002). Expanded government administration and incentives for moving to the area have substantially increased the region’s population, while investments in fishing and phosphates serve to absorb a reserve pool of labour (known as *dakhilis*, coming from Morocco’s “interior”) drawn to work in Morocco’s “southern provinces” while sending remittances to the country’s interior (Mundy 2012).

In addition to the economic transformations and demographic growth—part of the transformation or even origination of several cities across Western Sahara over the past two decades—Laâyoune, in particular, has been the site of the proliferation of governing administrations. In 1991, the United Nations established its Western Sahara mission headquarters in Laâyoune to maintain the ceasefire and carry out a referendum. Meanwhile, Morocco has tried to integrate the part of the region it controls into the rest of the country, in part by providing housing, water, and sometimes employment at the level of local government. As the outbreak of violent confrontations between Sahrawis and *dakhilis* in Laâyoune in 2010 attests, the distribution of these services for political ends—housing and jobs in particular—has become an important facet of everyday life in Laâyoune and, increasingly, of the conflict itself (Bennani 2010). Just as the Bukra’ mine was essential to the establishment of Laâyoune, the ongoing exploitation of phosphates and other natural resources in the region<sup>9</sup> has sustained the expansion of urban centres in Western Sahara since the UN ceasefire. Rather than focusing on the small company town that surrounds the mine itself, however, I suggest that Laâyoune is largely constituted by

the kind of governmental infrastructure that has accompanied resource-making projects during two different moments of Western Sahara's decolonization. From moving the Spanish colonial apparatus inland while establishing the mine to the dual presence of Moroccan and UN administrations since 1991, a "surfeit of government" (Feldman 2008, 1) remains a defining feature of Laâyoune, and of the unresolved process of decolonization in Western Sahara more generally.

## **Part II: Global Political Futures: Remaking Phosphate Reserves**

As the example of Laâyoune helps to illustrate, phosphates emerge as a significant factor in transforming the social geography of Western Sahara at what might be thought of as two different moments of decolonization: post-World War II colonial Spanish Sahara, and again since 1991 under a Moroccan occupation that coexists with the UN-administered ceasefire. The conventional geopolitical approach of international relations provides a useful insight in pointing out the different moments when phosphates have been lucrative to the entity controlling Western Sahara, and when they have not. However, the complex political processes at work in making these things matter in the present moment differ substantially from the colonial period. From this perspective, the prevailing geopolitical approach that structures the debate surrounding the Western Sahara conflict provides little insight, since it conceptualizes natural resources as abstract commodities, the importance of which remains unchanged across time and space. The rest of this article considers three concepts or discourses—scarcity, security, and crisis—that influence the contemporary "resource-making project" of phosphates. Specifically, I examine the different temporalities converging in the contemporary moment (Limbert 2008) through concern over phosphate rock supply following a 700 % increase in prices from 2007 to 2008 (Elser and Bennett 2011, 30). This price shock prompted both an expansion in Moroccan phosphate production<sup>10</sup> and broader concern over world supplies of phosphorus. While the visible effects of these developments on the ground in Western Sahara may seem negligible, I suggest that the discourses emerging from this event could have ramifications for the struggle over Western Sahara's political future.

### *Scarcity*

One of the primary uses of mined phosphate rock is in fertilizer. Since the late 19th century, phosphorus has been imported to Europe in various forms, but with the mid-20th-century "Green Revolution," in particular, chemical fertilizer made from phosphate rock has become integral to

intensive agriculture in many parts of the world. Closely integrated with agricultural production, phosphate minerals, not unlike oil, are as much constitutive of the metabolic relationship between humans and nature as food itself. However, phosphorus is a basic element and one of the essential nutrients that render land arable, so that, unlike oil, there is no synthetic substitute. Traditionally, phosphorus was often replenished either by using human waste as fertilizer or through less intensive agricultural practices such as crop rotation. But as phosphate-rock-based chemical fertilizer replaced many of these practices, the cyclical yields of agricultural production have increasingly been tied to a continuous supply of phosphate rock (Cordell, Drangert, and White 2009, 293–99).

From an environmental perspective, the 2007–8 price shock has generated increased concern about the temporal tension between a finite resource, phosphate rock, and the need for renewable supplies of soil nutrients, including phosphorus. A number of environmental scientists, wondering “how humanity became addicted to phosphate rock” (Cordell et al. 2009, 302), have started research collectives and Web sites around phosphorus use,<sup>11</sup> articulating their concerns over the scarcity of phosphate rock through the concept of “peak phosphorus.” An article from the journal *Ecologist* explains this concept and its ramifications:

Suddenly however, it seems the limits are almost upon us. In 2007, physicist Patrick Déry applied to phosphate rock the same statistical method that has been used consistently to predict when oilfields will peak. His results suggest that phosphate production has already peaked. If true, that would be catastrophic news, especially for the less-industrialized world (Kingston 2010, 6–7).

The “peak oil” method assumes that the remaining quantity of a given resource is known and inelastic. By modelling future demand and applying these projections to the quantity of resource remaining in reserve, this method predicts a future tipping point, after which production levels will drop and prices will rise. Following calculations that differ from those mentioned above, “peak phosphorus” has also been predicted for 2033 (Cordell et al. 2009, 298).

The “peak” model assumes that a resource’s reserve base is a natural, and static, fact. As Coronil (1997) explores in his study of oil production in Venezuela, however, natural resources are products of a number of political economic processes generative of value, including what is known as “differential rent.” Differential rent accounts for the varying levels of productivity among all the sites brought into production in order to satisfy market demands for a given natural resource. A mine that yields high-quality phosphate rock requiring low-cost techniques, such as Bukra’, produces high rents. In order to make the least productive or

accessible phosphate deposit worth mining, a standard rate of profit must be set that averages with the most productive or accessible location. And because rents accrue to the property owner, whether individual, state, or corporate, the owner can act as a monopoly with the power to maintain “a reserve price which they typically demand and extract before they release the resource to others to exploit” (Harvey 2010, 81). This is how mineral and petrochemical resource prices are generally set.<sup>12</sup> While this reserve price is typically quite low because of the coercive laws of competition, changes in price will affect the quantity or yield of a resource, and these changes can occur through technological as well as natural means. In other words, scarcity is not simply a question of how much of a given resource exists “in nature,” but depends upon a number of political economic processes that produce nature—and resources—as such.

Morocco’s response to the price shock of 2007–8 illustrates this point. In 2010, the International Fertilizer Development Center (IFDC), an international non-governmental organization<sup>13</sup> with headquarters in Muscle Shoals, Alabama, published a report with aggregated data on phosphate resources from around the world, the first of its kind since the end of the Cold War. Based on a revised estimate of world reserves in phosphate rock, the report concluded that “at current rates of production, phosphate rock reserves to produce fertilizer will be available for 300–400 years” (Van Kauwenbergh 2010, 43). This revision, extending the horizon for phosphate rock supply into the distant future, was not the result of a discovery of new deposits. Rather, the authors of the study projected a new timeline for phosphate rock based on incorporating a broad swath of previously known deposits into the category of “reserves”—a revision attributed almost entirely to an increase in Morocco’s estimated phosphate reserves, from 5.7 to 50 billion tons. As the report states, “the world reserve of phosphate rock is a dynamic figure” (Van Kauwenbergh 2010, vii). This dynamism, however, is not simply the elasticity of supply in response to demand. Morocco’s ten-fold increase was largely the reclassification of large deposits from “reserve base”—a category discontinued by U.S. Geological Survey reports in 2009 (U.S. Geological Survey 2010, 119)—to “reserves” (Rosemarin and International Fertiliser Society 2011, 5). Whereas reserves include only “recoverable materials,” the reserve base “may encompass those parts of the resources that have a reasonable potential for becoming economically available within planning horizons beyond those that assume proven technology and current economics” (U.S. Geological Survey 2010, 194, Appendix C). In this sense, the adjustment also depends upon semantic ambiguity and sleight of hand. After all, what constitutes a planning horizon “beyond those that assume proven technology and current economics”? In the case of phosphates, as with other resources,<sup>14</sup> the

measurements for these projections currently remain the proprietary information of resource owners—in this instance the Moroccan national entity, OCP. But, as I have tried to demonstrate here, the proprietary nature of this information contributes to the proliferation of planning horizons; in this sense, these horizons—different global futures, in essence—might be thought of as the prevailing environmental imaginary of today.

### *Security*

In addition to extending the timeline for viable phosphate extraction into the distant future, the adjusted figures from the IFDC report also confirm that 85 % of the world's current known phosphate reserves can be found in Morocco (Morocco News Board 2010). Already one of the three largest phosphate-mining countries in the world, along with China and the United States, Morocco was, until recently, the only source for imported phosphates into the United States (U.S. Geological Survey 2010). Indeed, Morocco's increased share in the world market coincides with declining phosphate reserves in the United States (Van Kauwenbergh 2010, 13). For scholarship concerned, implicitly or otherwise, with security, this makes Morocco's geopolitical interests and the accessibility of these enormous reserves an object of concern. Scholarship expressing concern on this matter ranges in tone from the technocratic—a call for “broad governance agreements” with Morocco (Rosemarin and International Fertiliser Society 2011, 6)—to the hyperbolic:

Many of the world's food producers are in danger of becoming completely dependent on trade with Morocco, where press reports have emerged of Dubai-style luxury developments being planned in anticipation of phosphorus wind-falls (Elser and Bennett 2011, 31).

A phosphorus supply associated with the near term has generated a discourse focused on scarcity, while phosphorus supply projected into the long term has generated a discourse focused on security. And yet the two discourses and temporalities also intertwined when, following the 2007–8 price spike, U.S. national security concerns addressed the maintenance of phosphorus supply in the short term:

In May [2011], a workshop sponsored by the US Department of Energy included phosphorus alongside dysprosium, yttrium and other rare earth elements of crucial importance to US national security that face potential supply bottlenecks (Elser and Bennett 2011, 30).

Similarly, in scholarship concerned with the scarcity of phosphate rock, the phrases “global food security” and “global phosphorus security” are frequently used to buttress arguments for alternative models of phosphorus supply.<sup>15</sup>

*Crisis*

Indeed, scarcity and security concerns over global phosphate reserves have a shared historical and conceptual point of departure. Historically, these concerns derive from the price increase of 2007–8. Conceptually, both discourses attribute this price shock to a crisis. Understood as an event resulting from a disequilibrium between supply and demand, a *crisis*, in these terms, is an economic problem. It is not my intention here to critique the conception of capitalist crisis, which recognizes the structural tendencies in capitalism toward over-accumulation and the destruction of capital that follows. Rather, I am following from Mitchell’s critique of the historicization of the 1973–74 oil crisis:

In the 1973–74 oil crisis, the law of supply and demand was not a fiction, but a fabrication. It was a precise piece of equipment carefully fabricated by certain parties to a dispute. To achieve their goals, those participants tried to organise an event that was assembled and performed in such a way that the laws of economics might operate (Mitchell 2011, 174).

Whereas Mitchell attributes a certain amount of agency to the international oil industry in fabricating the 1973–74 oil crisis, I am not suggesting the same kind of strategy with respect to the U.S. fertilizer industry. I simply want to point out the resources that become available from defining an event as a crisis, and the discourse and policies that emerge as effects of this event historicization.

Thus, one discourse claims to identify scarcity as the cause of the crisis, while the other takes responsibility for protecting against future events of this nature through improved regimes of governance, or security. Both discourses—again, they are frequently intertwined—attempt to define the future. If we take a step back from this debate over “peak phosphorus” and revisions to world phosphate reserves, it becomes immediately apparent that the current “resource-making project” surrounding phosphates concerns its temporality in a manner distinct from the period of “discovery” during Spanish colonialism. During the post–World War II moment discussed earlier, the potential associated with minerals in the Sahara was absolute: either mineral wealth was there or it was not, and the verification of this potential depended upon the act of discovery. In the present moment, however, the potential associated with phosphate

rock is much more ambiguous and depends upon the planning horizons used for projecting its future use.<sup>16</sup> Are there ramifications for using this resource in the short or long term? Is its depletion near (33 years) or distant (300–400 years)? And to what extent is this future finite, or is this horizon constantly being adjusted?

The association of phosphate production with a crisis in global food production has had the effect of saturating the immediate future with gravity and concern:

In 2007–2008, the same pressures that caused the recent global food crisis led to phosphate rock and fertilizer demand exceeding supply and prices increased by 700% in a 14-month period ... the short-term situation can be seen as an indication of what is to come (Cordell et al. 2009, 294).

The notion of crisis as marking “what is to come” echoes Jane Guyer’s conception of punctuated time. For Guyer, crisis serves as both interruption and omen, marking the potential for imminent transformation through “signal event moments in near-future time at which the whole world could change” (Guyer 2007, 417). Crisis marks both a short-term situation that offers the opportunity to break with the past (potentially ending humanity’s “addict[ion] to phosphate rock”; Cordell et al. 2009, 302) and the potential for a catastrophic end point should soil nutrients be depleted once and for all. As one commentator on the food crisis has written, “Civilization can survive the loss of its oil reserves, but it cannot survive the loss of its soil reserves” (Brown 2011).

While the affective sense of time associated with phosphates remains contested, the concerns over scarcity and security overlook the fact that, for fertilizer manufacturers and the Moroccan state, the price increase in 2007–8 was not a crisis at all. Instead, an event termed a “crisis” has enabled both Moroccan phosphate mining and U.S. fertilizer manufacturing interests to assemble a new set of political-economic arrangements that appear to suit both parties quite well. With U.S. phosphate production in decline, American fertilizer manufacturers retain a reliable source of a crucial ingredient for commercial fertilizer, while the Moroccan state can expand a pillar of its economy.

Because OCP does not keep separate data on Bukra’ reserves (Chick 2013), it can be difficult to discern the ramifications of this adjustment to Moroccan reserves for phosphate production in Western Sahara. Even if the figures have no impact on production at Bukra’, a study of the dispute in 1983 suggested that “[i]t is more important for Morocco ... to deny the Saharan phosphates to a competitor than to mine them itself” (Damis 1983, 29). An increase in Morocco’s share of global reserves can only reinforce that dynamic. Unlike 30 years ago, however, the information on

phosphate reserves has now been aggregated into a global data set and reproduced through scientific and journalistic discourses. As Gabrielle Hecht (2012, 211) notes, the process of making data global can be prone to certain exclusions that, beyond the initial point of erasure, are not deliberate, but reproduce a certain “scientific ignorance.”<sup>17</sup> Both the IFDC and USGS reports illustrate this point, listing deposits for “Morocco and Western Sahara” but not for Western Sahara separately (Van Kauwenbergh 2010, 19, 33, 36, 40, 41; U.S. Geological Survey 2010). Once figures such as Morocco’s 85 % share of world phosphate reserves are cited in scholarly and journalistic accounts, Western Sahara has long since been rendered invisible.<sup>18</sup> The global discourses around phosphate reserves, then, have the effect of erasing Western Sahara as a space and source of resources, even while events in Laâyoune and elsewhere in the region increasingly make the conflict visible at an international scale.

### **Conclusion**

The study of natural resources lends itself to theorizing the politics of nature and the politics of time. And the space of Western Sahara, where territorial control and political futures remain highly contested, provides an opportunity to consider the ramifications of resources in political conflict at different historical moments. Rather than isolating phosphates as a decisive factor either in the origins or in the continuation of the conflict, tracing the dynamics involved in making phosphate rock a resource helps to highlight how this material has become politically significant at a number of different sites and scales, including the history of the Western Sahara conflict; the production of the urban administrative infrastructure of Laâyoune; and the formation of a number of discourses around the global future of phosphates in the present. These seemingly disparate political processes, social spaces, and discursive formations provide some insight into the changing politics of nature and time at two different moments of decolonization. Mid-20th-century resources in the Sahara epitomized the potential to prolong empire amidst a radical indeterminacy in the political formations of the decolonizing world. In contemporary times, the anxieties surrounding global phosphate reserves are indicative of the convergence of nature with time in contemporary environmental imaginaries. Meanwhile, just as the discovery of phosphates effectively brought Spanish Sahara into being, interest in the future of phosphates in the present moment serves to obscure the space of Western Sahara at the level of global scientific discourse, even as ongoing changes to the region’s social geography continue to produce conflict in the everyday lives of people living in Laâyoune and elsewhere in the region.

### Acknowledgements

I would like to thank Mandana Limbert, Gary Wilder, Neil Agarwal, and two anonymous reviewers for their careful reading and helpful comments on a draft of this paper. Thanks are also due to Dagmar Herzog, Julie Skurski, and the History and Humanities Seminar at CUNY–Graduate Center, where this paper was workshopped; and to Luke Struckman and Tristan Sturm for their encouragement and initiative. Finally, I would like to express my gratitude to this journal’s editor, Ghazi-Walid Falah, for his patience with me throughout the submission process.

### Notes

- 1 Popular Front for the Liberation of Saguia el Hamra and the Rio de Oro.
- 2 My thanks to an anonymous reviewer for drawing my attention to this particular work.
- 3 This is not presented as a comprehensive review of literature on the topic: I am not, for example, addressing works in Arabic, French, or Spanish. However, the works cited here are characteristic of a conventional geopolitical / international relations paradigm that is particularly influential in English-language literature on Western Sahara.
- 4 *Sahrawi* is simply Arabic for a Saharan person (or thing). In a general anthropological sense, it refers to Hassaniya-speaking people throughout southern Morocco, Mauritania, and the Algerian Sahara. More specifically, Sahrawi has developed an ethno-nationalist meaning since mid-20th-century decolonization. Polisario, for example, represents the Sahrawi people at the United Nations (Zunes and Mundy 2010, xxi–xxii, 92–95).
- 5 Daniel Yergin’s (1991) extensive empirical history of oil, which foregrounds happenstance and discovery at every turn, exemplifies this narrative approach.
- 6 As a Protectorate, the colonial administration in Morocco reported to the French Ministry of the Colonies but operated with relative autonomy, while Algeria was administered through the French Ministry of the Interior.
- 7 My thanks to an anonymous reviewer for referring me to these sources on the history and debates surrounding the establishment of OCRS.
- 8 Sahrawis successfully undermined the Bukra’ mining operation on multiple occasions while resisting Spanish colonial rule, by sabotaging “the most obvious target” (Mercer 1976, 230): the conveyor belt. Bukra’ remained a pivotal target and strategic point in the armed struggle between Polisario and Morocco during the 1980s.
- 9 Fishing off the coast of Western Sahara has been an important resource and remains an ongoing point of contention in Morocco’s renewal of a fishing agreement with the European Union.
- 10 In 2010, Morocco’s Office Chérifien des Phosphates (OCP) announced plans to build four new fertilizer units, expand its mining capacity 60 %, and increase its processing capacity more than four-fold (Ghanmi 2010).
- 11 See, e.g., GlobalPNetwork (<http://globalpnetwork.net>), SustainableP

(<http://sustainablep.asu.edu>), and PhosphorusFutures (<http://phosphorus-futures.net>). These research groups propose phosphorus recovery systems as a sustainable alternative to phosphate rock mining. Since almost none of the phosphorus ingested by way of fertilized foods is retained by the body, proposed solutions focus on recapturing the phosphorus in human waste. As one article puts it, “A paradigm shift is needed to see human excreta as a potential resource rather than a waste” (Rosemarin and International Fertiliser Society 2011, 19). The threat of phosphorus depletion, however, varies widely. The soils of most large-scale producers have accumulated sufficient levels of phosphorus from sustained use of heavy fertilizers. Smaller peasant farmers face nutrient depletion more immediately. Rather than looking at this as a political-economic problem resulting from the uneven distribution of commercial fertilizer, the sustainability systems approach for recovering phosphorus suggests targeting peasant farming for this “paradigm shift” in the use of human waste: “That sub-Saharan Africa uses such low levels of chemical fertiliser ... provides an immediate opportunity for the use of sanitation-based reuse systems” (Rosemarin and International Fertiliser Society 2011, 15). See Cordell et al. (2009, 2011).

- 12 In the case of oil or natural gas, predicting this price has itself become an industry of sorts that absorbs speculative capital in the form of commodity futures. Entire consulting practices have developed around forecasting these prices (see Mason 2007). This is not the case with phosphate mining: “Unlike many commodities whose price is determined on futures exchanges, phosphate transactions are mostly negotiated directly between producers and industrial users” (Ghanmi 2010).
- 13 “IFDC is a public international organization, governed by an international board of directors with representation from developed and developing countries. The nonprofit Center is supported by various bilateral and multilateral aid agencies, private foundations and national governments. IFDC was established in 1974 in response to the twin crises of food insecurity and rising energy prices. Parallel crises threaten the world again.” See <http://www.ifdc.org/About>.
- 14 Timothy Mitchell (2011, 243–46) contrasts the ambiguities surrounding peak oil with the politics of climate change, based on the difference between access to accurate measurements: whereas climate change can be measured from public space, the material for measuring oil reserves remains proprietary and secret. The IFDC report also notes that basic classifications such as “reserve” and “resource” vary depending on the phosphate producer (Van Kauwenbergh 2010, vii).
- 15 Specifically, two sources cited elsewhere in this article use the phrase “global food security” in the article title: Cordell et al. (2009), “The story of phosphorus: Global food security and food for thought”; and Cordell et al. (2011), “Towards global phosphorus security: A systems framework for phosphorus recovery and reuse options.”
- 16 I thank Mandana Limbert for drawing my attention to the different forms of potential that can be associated with a given resource at different historical moments, both in her work (Limbert 2008) and in conversation.

- 17 Hecht calls this “a textbook case of what Robert Proctor [2008] calls *agnology*: the ‘conscious, unconscious, and structural production of ignorance.’”
- 18 The NGO Western Sahara Resource Watch attempts to highlight the trajectory of Western Sahara resources from source to end user by identifying the corporations purchasing the material, and have successfully exerted pressure on certain governments to divest from corporations making these purchases (see <http://www.wsrw.org/>).

## References

- Amin, S. 1994. *Re-reading the postwar period: An intellectual itinerary*. New York: Monthly Review Press.
- Belime, E. 1951. Avenir de l'Union française. *Hommes et mondes* 58:672–88.
- Bennani, D. 2010. Exclusif. La vérité sur les insurgés de Laâyoune. *Tel Quel*, November. [http://www.telquel-online.com/archives/446/index\\_446.shtml](http://www.telquel-online.com/archives/446/index_446.shtml)
- Beslay, F. 1993. Les confins algéro (mauritano) marocains : une formule originale d'administration adaptée aux grandes nomades. In *Nomades et commandants : administration et sociétés nomades dans l'ancienne A. O. F.*, ed. E. Bernus, J. Clauzel, P. Boilley, and J.-L. Triaud, 29–35. Paris: Karthala.
- Boilley, P. 1993. L'Organisation commune des régions sahariennes (OCRS) une tentative avortée. In *Nomades et commandants : administration et sociétés nomades dans l'ancienne A. O. F.*, ed. E. Bernus, J. Clauzel, P. Boilley, and J.-L. Triaud, 215–41. Paris: Karthala..
- Brower, B. 2009. *A desert named peace: The violence of France's empire in the Algerian Sahara, 1844–1902*. New York: Columbia University Press.
- Brown, L. R. 2011. The new geopolitics of food. *Foreign Policy* 186:54–63.
- Chick, K. 2013. In remote Western Sahara, prized phosphate drives controversial investments. *Christian Science Monitor*, 24 January. <http://www.csmonitor.com/World/Africa/2013/0124/In-remote-Western-Sahara-prized-phosphate-drives-controversial-investments>
- Cordell, D., Drangert, J.-O., and White, S. 2009. The story of phosphorus: Global food security and food for thought. *Global Environmental Change* 19(2):292–305.
- Cordell, D., Rosemarin, A., Schroder, J. J., and Smit, A. L. 2011. Towards global phosphorus security: A systems framework for phosphorus recovery and reuse options. *Chemosphere* 84(6):747–58. [doi:10.1016/j.chemosphere.2011.02.032](https://doi.org/10.1016/j.chemosphere.2011.02.032)
- Coronil, F. 1997. *The magical state: Nature, money, and modernity in Venezuela*. Chicago: University of Chicago Press.
- Damis, J. 1983. *Conflict in Northwest Africa: The Western Sahara dispute*. Stanford, California: Hoover Institution Press.
- Davis, D. K., and Burke, E. 2011. *Environmental imaginaries of the Middle East and North Africa*. Athens: Ohio University Press.
- Ehsani, K. 2003. Social engineering and the contradictions of modernization in Khuzestan's company towns: A look at Abadan and Masjed-Soleyman.

- International Review of Social History* 48(3):361–99.
- Elser, J., and E. Bennett. 2011. Phosphorus cycle: A broken biogeochemical cycle. *Nature* 478(7367):29–31. doi:10.1038/478029a
- Feldman, I. 2008. *Governing Gaza: Bureaucracy, authority, and the work of rule, 1917–1967*. Durham, North Carolina: Duke University Press.
- Ferry, E. E., and Limbert, M. E. 2008. *Timely assets: The politics of resources and their temporalities*. Santa Fe, New Mexico: School for Advanced Research Press.
- Ghanmi, L. 2010. Morocco's OCP to build four fertiliser units. *Reuters*, 26 November. <http://www.reuters.com/article/2010/11/26/ozabs-morocco-ocp-phosphate-idAFJJOE6AP05D20101126>
- Guyer, J. I. 2007. Prophecy and the near future: Thoughts on macroeconomic, Evangelical, and punctuated time." *American Ethnologist* 34(3):409–21.
- Harvey, D. 2010. *The enigma of capital and the crises of capitalism*. Oxford: Oxford University Press.
- Hecht, G. 2012. *Being nuclear: Africans and the global uranium trade*. Cambridge, Massachusetts: MIT Press.
- Hodges, T. 1983. *Western Sahara: The roots of a desert war*. Westport, Connecticut: L. Hill.
- Joffé, G. 1987. Frontiers in North Africa. In *Boundaries and state territory in the Middle East and North Africa*, ed. G. H. Blake and R. N. Schofield. Cambridge: Middle East and North African Studies Press.
- . 2010. Sovereignty and the Western Sahara. *Journal of North African Studies* 15(3):375–84.
- Kingston, E. 2010. Peak phosphorus: Our most important nutrient running out. *Ecologist* 40(8):6–7.
- Kouzmine, Y., Fontaine, J., Yousfi, B.-E., and Otmane, T. 2009. Etapes de la structuration d'un désert : l'espace saharien algérien entre convoitises économiques, projets politiques et aménagement du territoire. *Annales de géographie* 670:659–85.
- Limbert, M. 2008. Depleted futures: Anticipating the end of oil in Oman. In *Timely assets: The politics of resources and their temporalities*, ed. E. E. Ferry and M. E. Limbert. Santa Fe, New Mexico: School for Advanced Research Press.
- . 2010. *In the time of oil: Piety, memory, and social life in an Omani town*. Palo Alto, California: Stanford University Press.
- Mackenzie, D. 1880. Company No: 13671; North-West African Company Ltd. Incorporated in 1880. Dissolved before 1916. BT 31/2598/13671. British National Archives.
- Mason, A. 2007. The rise of consultant forecasting in liberalized natural gas markets. *Public Culture* 19(2):367–79. doi:10.1215/08992363-2006-042
- Mercer, J. 1976. *Spanish Sahara*. London: Allen & Unwin.
- Mitchell, T. 2011. *Carbon democracy: Political power in the age of oil*. London: Verso.
- Morocco News Board. 2010. Morocco's phosphates are 85% of world reserves. *Morocco News Board: The News Source for Moroccan Affairs*, 5 November. <http://www.moroccoboard.com/news/4902-moroccos-phosphates->

[comprise-85-of-world-reserves](#)

- Mundy, J. 2012. Moroccan settlers in Western Sahara: Colonists or fifth column? *The Arab World Geographer* 15(2):95–126.
- Peet, R., Robbins, P., and Watts, M. 2011. *Global political ecology*. London: Routledge.
- Proctor, R. 2008. Agnotology: A missing term to describe the cultural production of ignorance (and its study). In *Anagnotology: The making and unmaking of ignorance*, ed. R. Proctor and L. L. Schiebinger, 1–36. Stanford, California: Stanford University Press.
- Rézette, R. 1975. *The Western Sahara and the frontiers of Morocco*. Paris: Nouvelles éditions latines.
- Rosemarin, A., and International Fertiliser Society. 2011. *Future supply of phosphorus in agriculture and the need to maximise efficiency of use and reuse*. Leek, U.K.: International Fertiliser Society.
- Shelley, T. 2004. *Endgame in the Western Sahara: What future for Africa's last colony?* London: Zed Books. <http://site.ebrary.com/id/10231402>
- Thobhani, A. 2002. *Western Sahara since 1975 under Moroccan administration: Social, economic, and political transformation*. Lewiston, New York: Edwin Mellen.
- Thompson, V., and Adloff, R. 1980. *The Western Saharans: Background to conflict*. London: Croom Helm.
- Trumbull, G., IV. 2011. Body of work: Water and reimagining the Sahara in the era of decolonization. In *Environmental Imaginaries of the Middle East and North Africa*, ed. D. K. Davis and E. Burke III, 87–113. Athens: Ohio University Press.
- U.S. Geological Survey. 2010. *2009–2010, Mineral Commodity Summaries, Phosphate Rock*. Washington, D.C.: U.S. Department of the Interior. [http://minerals.usgs.gov/minerals/pubs/commodity/phosphate\\_rock/](http://minerals.usgs.gov/minerals/pubs/commodity/phosphate_rock/)
- Van Kauwenbergh, S. J. 2010. *World phosphate rock reserves and resources*. Muscle Shoals, Alabama: IFDC.
- Vitalis, R. 2007. *America's kingdom: Mythmaking on the Saudi oil frontier*. Stanford, California: Stanford University Press.
- Wilder, G. In review. *Freedom time: Negritude, decolonization, and the future of the world*. Durham, North Carolina: Duke University Press.
- . 2012. Eurafrique as the future past of black France: Recognizing Leopold Sedar Senghor's postwar vision. In *Black France/France noire: The history and politics of blackness*, ed. T. D. Keaton, T. D. Sharpley-Whiting, and T. E. Stovall, 57–87. Durham, North Carolina: Duke University Press.
- Yergin, D. 1991. *The prize: The epic quest for oil, money, and power*. New York: Simon & Schuster.
- Zoubir, Y. H. 1998. Western Sahara: Political economy of a conflict. In *Economic crisis and political change in North Africa*, ed. Azzedine Layachi, 149–63. Westport, Connecticut: Praeger.
- Zunes, S., and Mundy, J. 2010. *Western Sahara: War, nationalism, and conflict irresolution*. Syracuse, New York: Syracuse University Press.