

Critical minerals, fertilisers, and world war: Italian colonialism and the political ecology of phosphate in the Mediterranean

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Abstract

This article traces the origins of phosphate commodity chains in the Mediterranean region, focusing on Italy's role in the first half of the 20th century. It argues that, due to its key role in Italy's economic development and geopolitical strategies, phosphate can be seen as a critical mineral to the country, even if – at the time – this terminology was not yet used by its policymaking circles. Italy sought to secure its phosphate supplies by invading Libya, while also obtaining mining concessions in Tunisia and Egypt. Phosphate imports became necessary to the fascist regime's policy of purported agricultural self-sufficiency. However, when WWII broke out, Italy's phosphate supplies collapsed. The role of competition over natural resources as a factor contributing to war is of contemporary significance, in light of the current 'scramble' for critical minerals.

Keywords: critical minerals, extractivism, fertilisers, imperialism, phosphate, political ecology, war.

Introduction

'[T]he ownership of materials and men in the darker world is the real prize that is setting the nations of Europe at each other's throats' (Du Bois 2022, 30). In his illuminating 1915 essay, W. E. B. Du Bois thus argued that imperialist competition over the resources of the colonies was a crucial underlying cause of World War I (WWI). Of course, the world wars were the outcomes of a complex and interactive web of multiple factors, both structural and contingent (Anievas 2012). Nonetheless, the race for the treasures of the earth was not a negligible one.

This article zooms in on Italy's efforts to pursue its 'phosphate mirage' (Francioni 1996) of conquering direct and reliable phosphate supplies in North Africa between the early 20th century and

the end of World War II (WWII). This case study is situated within current debates on critical minerals as a special category of natural resources (e.g., Kalantzakos 2023; Vivoda et al. 2024). I argue that – due to its key role in Italy’s economic development and geopolitical strategies – phosphate can be seen as a critical mineral to the country, even if – at the time – this terminology was not yet used by its policymaking circles. The emergence of the political ecology of phosphate in the Mediterranean – that is, of the web of political, economic and environmental interactions in phosphate commodity chains – was shaped by the contest for raw materials among colonial powers. The role of competition over natural resources as a factor contributing to war is in turn relevant to the current ‘scramble’ for critical minerals.

Phosphate is less renowned than today’s most distinguished critical minerals – such as lithium, cobalt and rare earths. Yet this compound of phosphorus and oxygen has manifold industrial applications, with chemical fertilisers taking the lion’s share (Brownlie et al. 2022). Phosphorus is in fact one of the ‘Big Three’ (together with nitrogen and potash) of the Green Revolution through which modern agriculture conquered the world. Additionally, China’s development of lithium-iron-phosphate (LFP) batteries has made phosphate fundamental to energy transition attempts. It is not by chance that phosphate is featured both in the EU’s list of Critical Raw Materials and the US’s List of Critical Minerals. Indeed, phosphate is a non-renewable resource, projected to become increasingly scarce and expensive (Elser and Haygarth 2020). Known global reserves are much more concentrated than those of fossil fuels, with almost 70% located in Morocco and Western Sahara alone (USGS 2024).

Ecologically, there are thorny issues linked to the so-called ‘devil’s element’ (Egan 2023). The industrialisation of phosphate has disrupted the phosphorus cycle, overshooting this ‘planetary boundary’ and thereby endangering the sustainable reproduction of life on Earth (Carpenter and Bennett 2011). In fact, excess phosphorus leakages into the water cause eutrophication: algal blooms proliferate, oxygen is depleted so that aquatic biodiversity cannot adequately sustain itself, and ‘dead zones’ expand in rivers, lakes and seas (Kirchman 2021). Moreover, phosphate mining and processing has serious environmental impacts, from an unquenchable thirst for water to various forms of pollution. For example, phosphoric acid production generates enormous masses of weakly radioactive waste, known as phosphogypsum, which is thrown into the sea or mounded in enormous ‘gypstacks’.

Phosphate price volatility, with dramatic spikes in 2008-09 and 2021-23, contributed to pushing this compound higher in the agenda of the ‘hard’ sciences, with debates on ‘peak phosphorus’ and ‘phosphorus security’ mainly kickstarted by Dana Cordell and her collaborators (Cordell et al. 2009). The social sciences and humanities have followed with their own contributions, including on the origins of the political ecology of phosphate in the Mediterranean (Dixon 2018; Gruskin 2021; Jackson 2016). Such valuable analyses have chiefly focused on the role of France. This article builds on them, providing

an original contribution through a comparison between the historical competition for natural resources and today's rush for critical minerals and through a shift of the empirical focus towards Italian imperialism. Additionally, by concentrating on phosphate, this study offers new materials to the recent wave of environmental history readings of fascism (e.g., Armiero et al. 2022; Sollai 2024) and the world wars (e.g., Laakkonen et al. 2017; Tucker et al. 2018).

The first section compares the scramble for natural resources of one century ago to the present competition for critical raw materials and traces a theoretical framework to interpret the ascent of phosphate as a critical mineral. The second section provides a brief methodological overview. The third section presents the earliest Italian interventions to secure phosphate supplies from North Africa. The fourth section analyses how phosphate became a critical mineral to fascist agricultural and industrial policy, until the regime's downfall. The conclusion reflects on the practical implications of this story regarding today's heightened competition over natural resources.

Phosphate as critical mineral: A theoretical framework

This section first discusses current social science debates on critical minerals, to then situate phosphate as a natural resource falling under this category. The incorporation of phosphate in capitalism as an accelerator of natural cycles is simultaneously interpreted as 'Cheap Nature' deployed to minimise the cost of labour and capital – as emphasised by Jason W. Moore (2015) – and as a source of both ground rent and ecological disruption – as theorised by John Bellamy Foster (2000). Drawing on the three volumes of Marx's *Capital* and on dependency theory, this intervention thus connects different authors to contribute to an understanding of the co-constitution of ecology and war.

Critical minerals as 'politicised nature'

The critical mineral concept has its roots in WWI, when the combating powers began to draft lists of 'war materials' needed to fight a fully industrialised conflict (MacLeod 2018). In that context, critical minerals emerged as those deemed essential to national security (a notion far from neutral) but whose supply could become imperilled. For example, until recently, phosphate was a critical mineral to the EU but not to the US, because the latter has sizable internal deposits that used to be considered a safe supply line (USGS 2024). However, in November 2025, the Trump administration added phosphate to the US's List of Critical Minerals, reflecting concerns about decreasing domestic reserves and China's rise in phosphate commodity chains. Due to this security-fragility nexus, world powers deemed that the sourcing of critical minerals could not be left to ordinary market mechanisms; it was rather necessary to enact additional 'extra-economic' measures – from diplomatic activism to full-scale invasion – to

ensure the replenishment of their stocks (see Magdoff 1969). This ‘politicisation of nature’ can still be considered as a defining trait of critical minerals.

In the 2010s, a third dimension came to the fore in addition to national security and supply fragility, namely criticality for the ‘green’ energy transition (Heffron 2020). However, after Russia’s invasion of Ukraine, war preparedness gained a renewed centrality (Vivoda et al. 2024). Finally, the Trump administration cast the energy transition aside, meaning that the original definition of critical minerals, centred on notions of national security, remains the most relevant. In fact, lithium, cobalt, and rare earths – to cite the most well-known examples – are not just needed for renewable energy, but also for advanced digital technologies and weapon systems (Kalantzakos 2023).

China’s edge on most critical mineral supply chains became a cause for concern for Western policymakers over the 2010s. For example, China is the world’s largest phosphate producer, thanks to large reserves within its borders (USGS 2024). Conversely, the EU almost completely relies on foreign imports, mainly from Morocco and Russia (Persona 2025). Additionally, China is establishing a foothold in North African phosphate, with investments in LFP gigafactories in Morocco and mines in Tunisia (Dempsey 2023; Webdo 2025). In recent years, therefore, the US and the EU enacted policies geared towards reducing their reliance on the dragon. This means incentivising domestic mining and processing, increasing reuse and recycling rates, enhancing efficiency in final use and sourcing raw materials away from China-controlled suppliers. However, this latter move has heightened competition to gain control over mineral reserves across the world. Some policy literature considers that the steps taken by Western countries to establish their own critical mineral supply chains abroad have not been incisive enough (Goldman Sachs 2023; Theodosopoulos 2020). However, another literature strand argues that the ‘urgency’ narrative around critical minerals risks exacerbating environmental degradation and resource conflicts, to the particular detriment of the countries where such raw materials are to be mined (Boafo et al. 2024; Lang et al. 2023). Indeed, armed conflicts involving critical minerals have already flared – for example – in the Democratic Republic of the Congo, Myanmar and Ukraine. Thea Riofrancos suggested that, historically, ‘labelling resources as “critical” has justified government support for extraction and access, deregulation of safeguards, and a preference for strong-arm tactics over co-operation’ (Riofrancos 2025). In other words, *the politicisation of nature that comes with ‘criticality’ underpins the deployment of additional extra-economic pressures relative to those already present in ordinary market relations*; the threat of violence is an implicit dimension of the genealogy of the critical mineral concept.

These dynamics can be interpreted through the lenses of dependency theory, which sees global inequalities as underpinned by a hierarchical international division of labour (Amin 1976; Bamberra 1978). Some countries compete in the global economy mainly by dominating the technological frontier.

They constitute the 'core' of the capitalist world system and are known in common parlance as the 'Global North'. The countries characterised by technologically 'backward' capitals constitute the 'periphery' of the world system, more often referred to as the 'Global South'. As technological unevenness forces the peripheries to compete in global markets through Cheap Nature – that is, cheap (human) labour or cheap (non-human) natural resources –, it can be argued that there are three main modes of insertion in the international division of labour: high-tech, low-tech with cheap labour, and low-tech with cheap natural resources (Feltrin and Julio Medel 2024). The actual configurations of these three modes is always mixed in different amalgams, but their uneven distribution still ensures that the international division of labour remains highly unbalanced.

There are eerie similarities between the historical scramble for Africa that followed the 1884 Berlin Conference and today's 'new scramble' (Moyo et al. 2012): a rush to secure natural resources in the context of the possible decline of the global hegemonic power (the UK then, now the US), a recrudescence of racist and nationalist narratives in the West, the proliferation of armed conflicts. Of course, the differences are innumerable: the contemporary preference for informal empire and 'proxy wars' as opposed to formal colonial administrations and boots on the ground, the 'green' patina drawn over mineral sourcing efforts, etc. A crucial divergence, however, relates to the nature of the competitors. The strongest powers involved in the original scramble for Africa were European countries, belonging to the core or semi-core of the world system. Today, instead, the race has two main contenders: the US, the world hegemon, and China, a rising power that, nonetheless, belongs to the semi-periphery, as its mode of insertion in the global economy still relies on a combination of technological advancement, cheap labour and cheap natural resources (Hickel et al. 2021).

Phosphate as accelerator of Cheap Nature

Europe's colonisation of foreign lands was a key factor in its rise to dominance of the 19th century's technological frontier. With the industrial revolution – as an increasing part of the workforce was pushed off the fields and into mines, factories, building sites and services –, the share of the global population living in the countryside started to decline in a slow and partial, but nonetheless secular, urbanisation process. How to feed growing masses of people that were not producing their own food was a matter of heated debate as shown, for instance, by Marx's interest in the work of agricultural chemist Justus von Liebig (Saito 2017).

In *Capital Volume I*, Marx distinguished between two forms of exploitation, the extraction of 'absolute surplus value' and that of 'relative surplus value' (Marx 1976, 429-438). In the former, exploitation is ensured by long hours and limited working-class consumption. However, attempts to

keep raising the rate of exploitation (the surplus-to-wage ratio) with this method eventually run up against the workers' biological limits. Relative surplus value extraction, instead, depends on the cheapening of wage goods. This lowers the value of labour power, since it takes less average labour time to produce the same amount of means of reproduction, allowing capital to appropriate an increasing output share relative to labour, thus shoring up profit rates.

As air and water can mostly be accessed for free even under capitalism, food is the most basic item in the basket of goods constituting the reproduction costs of the workforce. To enhance the accumulation of relative surplus value, food was cheapened through the 'modernisation' of agriculture. In the fields, diversity and internal inputs were substituted with uniformity and external inputs – through machines, chemical fertilisers, pesticides, and high-yielding seeds – which did increase productivity in the narrow sense, albeit with devastating effects on peasants' livelihoods and biodiversity (Shiva 2016). The appropriation of cheap natural resources and their transformation into fixed capital (machinery) and circulating capital (materials used up in one productive cycle) thus became a condition for the reproduction of cheap labour, moulding a Cheap Nature at the service of accumulation (Moore 2015). Phosphate as Cheap Nature was incorporated into the global economy as circulating capital; both as a raw material for fertiliser factories and as an auxiliary product for agriculture.

In *Capital Volume II*, Marx introduced the concepts of 'working period' and 'production time' (Marx 1992, 306-325). The working period refers to the sum total of paid working hours needed, on average, to make a given item. Production time, instead, refers to the total time needed to make the item. Production time includes the working period, but adds to it all the time during which no paid work is carried out. The divergence between working period and production time is minimal in industries characterised by uninterrupted paid work, for example continuous cycle chemical fertiliser factories, where the lights are on 24/7. Instead, the gap between production time and working period is particularly long where the unpaid 'labour of nature' constitutes a significant part of the process; 'the ripening of corn, the growth of an oak', as per Marx's examples (Marx 1992, 317). Needless to say, agriculture is a case in point, as its temporality is firmly embedded in natural cycles. Chemical fertilisers are thus a technology geared towards compressing production time in the fields, eliminating the fallow periods previously needed for the land to recover from nutrient loss:

All methods in agriculture which on the one hand distribute expenditure on wages and means of labour more evenly over the whole year, and on the other hand shorten the turnover, by diversifying the products and thus making different crops possible during the year, require an increase in the circulating capital laid out on production, on wages, fertilizer, seed, etc. This is the case with the transition from the three-field system (with fallow) to the system of crop rotation without fallow. (Marx 1992, 320)

The capitalist drive for the infinite expansion of commodity production increasingly ruptures natural cycles, generating a 'metabolic rift' that has a spatial and a temporal dimension (Clark and Foster 2009). Spatially, nutrient circulation within local ecosystems was replaced with a one-directional pipeline that taps nutrients from wherever they are most available in the earth, conveys them to wherever they are most needed to feed a working class increasingly concentrated in cities, and eventually accumulates them as waste into the world's waters. This not only widens the separation between town and country, but also enables the spatial distancing between livestock rearing and agriculture. In fact, mineral nutrients extracted from non-renewable reserves, resulting from the fossilisation of dead nature, make living plants and animals less dependent on each other for localised organic nutrient exchange and thus creates the conditions for intensive animal farming. Temporally, chemical fertilisers accelerate the turnover of capital in a way that organic fertilisers – such as manure or crushed bones – could never achieve, as they are themselves embedded in the concrete time of living beings. Nature took millions of years to transform the skeletons of plesiosaurs, mosasaurs, megalodon sharks and other – perhaps less charismatic – marine creatures into phosphate reserves, yet these deposits can be depleted in the span of centuries. *The shortening of the gap between working period and production time in agriculture has its material basis in the exploitation of an incomparably longer temporal gap between the two in mining.*

The phosphorus rent and resource conflicts

With the rise of industrial capitalism, fertilisers became needed particularly in the countries dominating the technological frontier, where a larger share of workers had abandoned the fields. Since the 1840s, phosphorus- and nitrogen-rich guano was extracted from Peruvian islands for export to the Global North (Bonilla 1974; Cushman 2013). The famed Peruvian theorist José Carlos Mariátegui sarcastically remarked:

It is interesting that in the story of the republic such coarse and humble substances as guano and nitrates should have taken over the role that had been reserved to gold and silver in a more romantic and less positivist era. (Mariátegui 1971, 10)

Guano raised the productivity of Europe's peasants and farm workers, lowering the cost of the food they made for the Old Continent's waged workforce, enhancing the extraction of relative surplus value there. The extractive workers of the Pacific coast, instead, were mostly Chinese 'coolies', convicts,

slaves and other figures toiling under different shades of coerced or semi-coerced labour (Méndez 1987). In Marx's terminology, they were exploited mainly under a regime of absolute surplus value extraction. This resulted in an unequal exchange of labour time, generated by the uneven conditions of workers in the Global South and North, accompanied by an asymmetric transfer of natural wealth also from South to North (Clark and Foster 2009; Marini 2022).

Marx further explored the metabolic rift in his theorisation of ground rent, in *Capital Volume III*, differentiating between 'absolute rent', 'differential rent I', and 'differential rent II' (Foster 2000, 141-177; Marx 1991, 751-950). Absolute rent is a share of surplus value that must be disbursed to landlords merely because they own the land, its extent thus depends on the balance of power between landlords and capitalists. For example, the British companies that initially dominated the guano trade had to pay royalties to the Peruvian state, which had effectively become the reserves' landlord after having nationalised them.

Differential rent I, instead, derives from the fact that, on certain lands, labour has a higher-than-average productivity not because of cutting-edge technologies, but thanks to natural conditions not reproducible by human work. Such 'gifts of nature' allow products to sell above their prices of production (costs plus average profit rate). For instance, the world's best guano reserves were concentrated in the Peruvian guano islands. This meant that one working hour in lower-quality reserves – say in the US's bat guano caves – extracted less and worse guano than one working hour in Peru's Chincha Islands, no matter the sophistication of the technology deployed. Thanks to the booming demand keeping the lower-quality reserves afloat, the companies extracting high-quality Peruvian guano could charge a markup beyond the average profit rate. However, *scrambles for differential rent appropriation tend to generate conflicts*. In our example, in the 1860s, Spain's attempt to wrest such a 'coarse and humble' treasure away from the British resulted in the Chincha Islands War, a clear instance of an intra-imperialist clash over natural resources.

Finally, differential rent II stems from the fact that certain lands achieve higher-than-average productivity not because of their natural qualities but due to earlier capital investments in them. To stick with guano, once this fertiliser was applied to the European fields, some nutrients were not absorbed within the crop year but remained incorporated in the land as 'legacy' phosphorus and nitrogen. Therefore, the concerned landlords could later, *albeit temporarily*, harvest a surplus profit that the owners of 'soil-mined' lands, impaired by nutrient depletion, could not reap.

However, after half a century of relentless extraction, guano reserves were mostly depleted. Nitrogen supplies were thus ensured by Chile's nitrate mines, over which British interests encouraged the War of the Pacific (1879-84) between Chile, Bolivia and Peru. Yet, in the early 20th century, German chemist Fritz Haber – also remembered as the father of modern chemical warfare – demonstrated how

to industrially fix nitrogen from thin air. The Haber-Bosch process to manufacture nitrogen fertilisers, applied on an industrial scale since the 1910s, annihilated the nitrate rent. Phosphorus, instead, became sourced through phosphate rock extraction. As a response to the Long Depression of the 1870s, superphosphate factories spread across the Global North, treating phosphate with sulphuric acid to manufacture chemical fertilisers, *grosso modo* the formula still in use.

Just like today's technological innovation drives tectonic shifts in extractive frontiers, these developments caused a major reconfiguration in global nutrient sourcing. While Peru's guano islands laid nearly exhausted and Chile's nitrate mines were abandoned to ruination, in the late 19th century three 'phosphate frontiers' were ripped open: the US Southeast, North Africa, and the South Pacific (Dixon 2021). This new constellation replicated the articulation of geographically uneven amalgams of absolute and relative surplus value extraction that had characterised the Guano Age. In fact, phosphate was extracted by workers inserted in colonial, racialised regimes of labour control to lower the reproduction costs of the metropolitan workforce (Araghi 2003). Additionally, phosphate was a fundamental raw material in the rise of the modern chemical industry (Dixon 2018), another example of how Global South colonisation was the 'dark side' of Global North industrialisation.

Since then, the phosphorus rent played a role in shaping North Africa's conflicts as, up to now, there is no widely used artificial substitute for phosphate in agriculture. Indeed, after WWII, the Green Revolution further generalised chemical fertilisers, engendering a hockey stick rise in global phosphate consumption and a related surge in eutrophication. Thus, through its double role as Cheap Nature necessary to the reproduction of cheap labour and as a source of ground rent in both mining and agriculture, phosphate simultaneously became a critical mineral to Europe and a driver of the ecological crisis.

Methodology and sources

This research is based on both secondary sources and, mainly, archival primary sources. I drew on secondary sources in five languages: Arabic, English, French, Italian and Spanish. The primary sources are in Italian and French, and I have retrieved them in the fonds of the Ministry of Agriculture and of the Industrial Reconstruction Institute (IRI) held by Italy's Central State Archive (Rome), the fond of the Ministry of the Colonies (renamed as Ministry of Italian Africa in 1937) held by the Ministry of Foreign Affairs' Historical Diplomatic Archive (Rome), the Italian Commercial Bank fond of the Banca Intesa Archive (Milan), the French Protectorate in Tunisia fond of France's Diplomatic Archives Centre (Nantes), and the Société des Phosphates Tunisiens fond of the online archive Entreprises-coloniales.fr.

A major limitation of this study undoubtedly lies in the fact that all its primary sources are of European origin. While I have attempted to scrutinise these documents through an internationalist lens, I certainly lacked much insight into the perspective of the colonised peoples, that of the indigenous miners in particular. Further, collaborative work should be done to bridge data and literatures from the two sides of the Mediterranean.

The imperialist roulette and the phosphate mirage

This section tells the story of Italy's early efforts to secure direct access to North African phosphate reserves. At the end of the 19th century, as a latecomer to both industrialisation and colonisation, the country could only boast an empire constituted by Eritrea and Somalia. Among colonialist circles, appetite for Africa's potential for Cheap Nature was both a push factor for further adventures and a justification for other aspirations, such as national prestige and the creation of an outlet for Italy's abundant surplus labour (Labanca 2002). In the context of the scramble for Africa, Italy saw Tunisia as its natural backyard, but these hopes were dashed by the establishment of the French protectorate there in 1881. The boot was thus left with the option of stomping on Libya. However, many policymakers held that the Libyan 'sandbox' – as it was dismissively called by politician Gaetano Salvemini – was not worth the trouble. The promoters of colonialism had thus to find in Libya something more appealing than sand, and phosphate they found. Or, rather, the mirage of it.

Italy's entry in North African phosphate mining has an extravagant alleged beginning. At the dawn of the 20th century, Tuscan businessman Gustavo Donegani was in Tunis with Sardinian mining engineer Giambattista Dessì and a former chivalry officer. According to journalist Auro Roselli, the three young adventurers dreamed of making a fortune by gambling at the roulette:

There is no safe method against the roulette but, by studying the numbers, the three discover and slowly verify a tiny imperfection in one of the roulettes. That's it: their wallets quickly inflate, but the urge to make more money inflates together with the wallets, and the owner starts growing suspicious. The three propose him a deal: free room and board in the hotel for three years, in exchange for a commitment not to play anymore and not to reveal the secret. [...] Now they have plenty of time; Tunis has become provincial to their eyes, so they travel and explore. One day, in the Gafsa basin, they discover a handsome phosphate deposit.¹

¹ Archivio Banca Intesa (ABI), Banca Commerciale Italiana (BCI), Società Finanziaria Industriale Italiana (SOFINDIT), 189(5). All sources in Italian and French were translated by the author.

There is a fair amount of mythology in this account. In fact, Gafsa's abundant phosphate reserves were unearthed in 1885 by French veterinarian Philippe Thomas, who had also discovered the Algerian Boukhaira reserves in 1873 (Pilotti 1908), thus inaugurating the North African phosphate frontier. Extraction in Gafsa had already begun in 1899, under the French-owned Compagnie des Phosphates et des Chemins de Fer de Gafsa (Dougui 1995). It is indeed unlikely that Gustavo Donegani owed his fortune to blackmailing a hotelier over a wonky roulette. More prosaically, his father owned the trading company Maison Luigi Donegani (Crimeni 1997). Nonetheless, it is certain that in 1904 the wheeler-dealer from Livorno founded Société des Phosphates Tunisiens, together with fertiliser industrialist Magno Magni and others, to exploit the phosphate reserves of Kalaa Djerda (today Kalaat Khasba).

The Kalaa Djerda reserves had been discovered in 1893-94. However, they were located on inalienable *habous* land, an Islamic-law form of the commons (El Kahlaoui 2024). As the bulletin *La dépêche coloniale* put it:

In an attempt to twist the law, the indigenous were dispossessed by giving them some valueless lands in exchange. However, after having accepted, the indigenous saw their mistake and forcefully protested, engaging in a legal proceeding whose resolution does not seem to be at hand.²

Despite indigenous resistance, in 1903, a group of French entrepreneurs led by Ernest Bellot (the main orchestrator of the fraud against the *habous*) was recognised ownership of the reserves through a farcical trial.³ The following year, Gustavo Donegani and Magni led the purchase of the Kalaa Djerda lands from the French group, but had to include some of its members – particularly Bellot – in Société des Phosphates Tunisiens.

Flashing back for a moment, superphosphate production first appeared in England in the 1840s, using crushed bones as its main phosphorus feedstock. In Italy, attempts at superphosphate manufacturing surfaced in the 1850s, but they were unlucky until the 1870s (Pezzati 1990, 152-153). In a few decades, the country became Europe's second-largest superphosphate producer, after France. The latter had the 'competitive advantage' of having colonised the North African lands holding the largest supplies: Tunisia, Algeria and especially, as it would become clear in the 1920s, Morocco. Italy, however, had the fortune of lying close to these reserves, so that its transportation costs were lower relative to most European rivals.

² Entreprises-coloniales.fr, Société des Phosphates Tunisiens.

³ *Ibidem*.

Magno Magni emerged as the most successful superphosphate entrepreneur of his time. He began his career as an underage worker at the silk spinning mill where his parents were employed, and then moved on to a chemical factory in Milan (Cau 2010). In 1884, Magni set up his own sulphuric acid factory in Vicenza and, from there, he expanded both upstream and downstream. In 1893, he took over Agordo's Valle Imperina pyrite mines, thus securing direct feedstocks for his plants. The almost-self-made man (his first employer's daughter had married him) also complemented his sulphuric acid production with superphosphate fertiliser units. The Kalaa Djerda mines thus crowned Magni's vertical integration project. The installations included a newly built company town to house the workforce in the desert, modestly called Magniville. The first cargo of Kalaa Djerda phosphate departed from the port of Tunis in 1906, and the first miners' strike promptly followed in 1907.⁴

In the early 1900s, an overproduction crisis in the fertiliser industry kickstarted a process of industrial concentration (Trinchieri 2001, 100-119). This was initially led by Magni himself, who in 1903 co-founded *Unione Concimi* to combine the capitals of most North Italian fertiliser producers. Nonetheless, in 1909, a renewed downturn coerced Magni into selling its *Société des Phosphates Tunisiens* stocks to French investors (Cau 2010, 269-270).

Meanwhile, in February 1910, Gustavo's youngest brother, Guido Donegani, joined the board of Italian mining company *Montecatini* and was made CEO after only three months. According to the article by Auro Roselli quoted above, there was a reason behind Guido's lightning-speed ascent:

[T]here is also a secret story, according to which – as his 'Tunisian phosphate brother' was akin to some kind of rich relative to *Montecatini* (at the time a modest firm on the verge of bankruptcy) – Guido shortly became the only gateway to the company's hopes.⁵

Regardless of its accuracy, this account exemplifies how the 'criticality' of phosphate mounted in Italy's public discourse.

The Kalaa Djerda mines, however, were far from covering Italy's burgeoning demand for phosphate. The country, having no reserves in its own territory, had to import most of its supplies from French and American companies (even *Société des Phosphates Tunisiens* was, by necessity, a French-registered company), with obvious impacts on its balance of trade and hard currency reserves. Italy would thus constantly attempt, up to WWII, to further penetrate into North African phosphate

⁴ Centre des Archives Diplomatiques de Nantes (CADN), Protectorat français en Tunisie, Dossier des grèves (1904-1920).

⁵ ABI, BCI, SOFINDIT, 189(5).

extraction. Société des Phosphates Tunisiens had been established with the backing of Milan's Banca Commerciale Italiana. The latter's competitor, Banco di Roma, responded by organising explorations in Egypt and Libya (Al-Salihi 2019).

In Egypt, Banco di Roma funded a mission by geologist Emilio Cortese. In 1910-11, Cortese scouted the Eastern Sahara and did strike phosphate by the Red Sea fishing village of El Qoseir (Cabassi 2012; Damir et al. 2023). In 1912, Banco di Roma established Società Egiziana per l'Estrazione e il Commercio dei Fosfati (also known as Società Egiziana Fosfati) to start the digging. However, Società Egiziana Fosfati's first ten years were an unlucky endeavour. The early excavations were attempted on ill-located deposits, with dismal financial results.⁶

Egypt, while nominally part of the Ottoman empire until 1914, was a *de facto* British protectorate, which helped the Italians in gaining the El Qoseir concession. Things were harder in Libya, as both the local authorities and Constantinople did not want to hear about Italy's policy of 'peaceful' economic penetration (Al-Barbar 1992). Since the 1900s, Libya was depicted as a 'phosphate El Dorado' by the Italian nationalist papers, to pressure for a more interventionist policy (Grange 1978). This proved to be a die-hard myth; up to the 1930s the Italian press would diffuse, from time to time, misinformation about Libya's supposed gargantuan phosphate reserves. Andrea Francioni aptly called this obsession the 'phosphate mirage' (Francioni 1996).

In 1902, Italian writer Salvatore Giannò claimed to have found copious phosphate and sulphur reserves in Tripolitania (Giannò 1911). Also based on these allegations, Banco di Roma opened a Tripoli branch in 1907, and started manoeuvring to obtain an authorisation to explore (Grange 1978, 242). Meanwhile, whispers circulated about British and French exploration projects in Libya. Italy, the nationalists clamoured, risked missing its last golden opportunity to really join the scramble for Africa. In 1910, Banco di Roma's envoy Enrico Bresciani established a phosphate exploration consortium bringing together Italian, French, Egyptian and Arab-Tripolitan capitals. The latter two consisted of figureheads whose presence was merely meant to appease the Sublime Porte. As reported in a confidential letter addressed to Italy's consul in Tripoli, Giulio Pestalozza, Italian capital's 'absolute supremacy in the deal [...] is guaranteed, because it is Banco di Roma that will provide the Egyptian and Arab groups with the necessary funds'.⁷

Confident that the trick would work out, Banco di Roma recruited engineer Ignazio Sanfilippo and count Ascanio Michele Sforza to lead the mission. However, to their great chagrin, the Italians found that the Ottomans had sensed the scam and maintained a firm opposition. As Egyptian prince

⁶ Archivio Centrale dello Stato (ACS), IRI (5591), r4419.

⁷ Archivio Storico Diplomatico (ASD), Ministero dell'Africa Italiana (MAI), I 101(4).

Muhammad Ali Halim explained to an Italian diplomat: 'The Turks are right to fear that the [European] powers want to open the economic doors to bring politics in'.⁸ Meanwhile, the Italian nationalist press mounted a raging campaign against the humiliation of the country's 'rightful' interests.

In the spring of 1911, faced with the risk of an Italian intervention, the Ottomans authorised the exploration. After a long wait in Tripoli, Sanfilippo and Sforza finally departed to the desert on 8 April (Sforza 1919). Even so, nationalist fervour in Italy had been masterfully built up. Sanfilippo and Sforza, on their part, sent open letters complaining about Ottoman 'absolute obstruction' against their efforts (Grange 1978, 267-269). In doing so, the two patriots put themselves in a difficult spot. Three days after the Italian invasion eventually began on 29 September 1911, they were taken prisoners by the Ottomans (to be released on 8 November 1912, after the Treaty of Ouchy was signed).

The Italian occupation paved the way to a long series of phosphate explorations, all unsuccessful (Castelli 1927). These activities were interrupted by WWI, but in 1920 the Italian press revived the rumours that cornucopian reserves had been detected in Libya. Banco di Roma thus sent Emilio Cortese to assess the exploitability of the deposits. The famed discoverer of El Qoseir's reserves was however surprised to realise that the Italian authorities *in loco* did not even want him to start:

[T]he excitement and the exaggerated hopes (let us say the illusions), arisen in the country, led to the *recommendation* to absolutely prevent Cortese, a mining engineer and a geologist, to carry out explorations, even superficial ones, of a geological-mining nature. [...] The undersigned immediately assessed that the materials in question were of *no value*. It is painful indeed to have been right. (Cortese 1920, 41-42)

As we know, the European powers' imperialist gamble on outward expansion was one of the underlying causes of WWI. Just like Gustavo Donegani's roulette, this was a stacked game; dangerous for many, but one in which the rich seldom lost much. The 1917 Austro-Hungarian invasion of Veneto, however, did wreck Unione Concimi's factories in Northeastern Italy. This time, a weakened Magni fell victim to the concentration process he had earlier spearheaded. In 1920, Guido Donegani led the absorption of Unione Concimi by Montecatini, which thus emerged as Italy's mining and chemical giant (Perugini 2014). Société des Phosphates Tunisiens' 'French group' opposed the merger, fearing that a reinforced Montecatini could become a vehicle for Italian assertiveness in Tunisia. Gustavo Donegani, who had become a resident of France, remained Société des Phosphates Tunisiens' leader and thus parted ways with Montecatini. As the elder brother was a 'phosphateer', in the business of selling the

⁸ *Ibidem*.

rocks, while the younger brother had become a 'superphosphateer', in the business of buying them, the relationship between the two deteriorated (Crimeni 1997, 421-422).

As we also know, the 1914-18 butchery was followed by a revolutionary upheaval raising the banner of international working-class solidarity. The 1919-20 Red Biennium swept the two shores of the Mediterranean, with land occupations and factory takeovers in Italy, and a strike wave through the Tunisian mines, with both Arab and Italian workers laying down their tools in a long dispute that spread from Gafsa to Kalaa Djerda (Tabbabi 2005, 90-113). The restructured and victorious Montecatini can then be seen as part of the capitalist basis for the fascist restoration. Guido Donegani's trajectory is telling. While Montecatini's president officially joined the National Fascist Party only in 1926, during the Red Biennium he was already protecting the fascist squads, and in October 1922 he supported the Blackshirts' March on Rome (Snowden 1989, 125-126). Montecatini would thus become the industrial centrepiece of the fascist agricultural policy that underpinned a renewed drive for aggressive expansionism, including a relaunch of the pursuit of the phosphate mirage.

From the Battle for Grain to catastrophe

Phosphate reinforced its status as a critical mineral to Italy through its role as Cheap Nature in fascist industrial and agricultural policy. Ironically, Italy deployed direct violence in relation to phosphate access only in the Libyan case, where it eventually found none. Nonetheless, Italy's access to Tunisian and Egyptian phosphate was also reliant on violence, albeit indirectly, as it depended on French and British colonisation. However, the fascist project, doubling down on Italian imperialism, brought the country increasingly in conflict with the more established colonial powers. This is also exemplified by Italy's efforts to contest France's firmer grip on the phosphorus rent.

Mussolini's 'fascist Green Revolution' (Sollai 2024) was propagandised as the 'Battle for Grain' and its core objective was making Italy self-sufficient for its wheat supplies. This worthy goal was, however, both instrumental to and conditional on Italy's imperialist power politics. On the one hand, as Italy prepared for further wars, wheat self-reliance was a military necessity, as the belligerent name of the campaign itself suggested. On the other hand, as agroecology was not on Mussolini's horizon, the Battle for Grain was essentially an exercise in diffusing heavy-input agriculture. It thus needed reliable phosphate supplies from abroad, preferably from Italian colonies, to shorten the gap between 'working period' and 'production time' in the fields, enhancing relative surplus value accumulation by lowering the reproduction costs of the country's working class.

Mussolini launched the Battle for Grain in 1925. However, the outlines of this project had been already sketched in Guido Donegani's 1920 strategy for Montecatini's expansion (Cau 2010, 297). In

1924, Montecatini inaugurated Italy's largest superphosphate factory in the newly created industrial area of Porto Marghera (Chinello 1979). To minimise the risk of further overproduction crises, propaganda was needed to bring fertilisers and pesticides (mainly copper sulphate) in every corner of the countryside. In Marxian terms, after the 'formal subsumption' of Italy's agriculture into capitalism via its gradual (and at the time yet incomplete) integration into production for the market, it was necessary to push on with 'real subsumption', the qualitative restructuring of the labour process via the deployment of capitalist technologies (Marx 1976, 1023-1038). This type of development contributed to disarticulate the rural working-class composition that had led the Red Biennium land occupations, averting land reform.

Montecatini had a marketing department in Rome (Petrini 1990), where designer Aldo Mazza drew posters with smiling peasants growing gigantic ears of wheat, which they tied into bunches that composed the National Fascist Party's symbol. The company's communication strategy thus bolstered the regime's chauvinist version of ruralism, exalting the Italian male peasant's capacity to dominate a racialised and gendered nature (Armiero et al. 2022). Meanwhile, the Ministry of Agriculture funded itinerant training programmes (the pre-existing '*cattedre ambulanti*') also aimed at persuading farmers to use fertilisers, even if that meant getting in debt.⁹ Montecatini thus took hold as a *de facto* state-backed monopoly. The Battle for Grain yielded its results; Italy's wheat production grew from 4,254,900 tonnes in 1922 to 8,183,800 tonnes in 1938 (ISTAT 1958, 106). This purported self-sufficiency, however, hid the country's reliance on phosphate imports, as the national production of superphosphate fertilisers inflated from 947,605 tonnes in 1922 to 1,652,978 tonnes in 1939 (ISTAT 1958, 131).

Given phosphate's increasingly critical role, the Italian state directly entered the business of sourcing it, substituting Magni in Tunisia and Banco di Roma in Egypt and Libya, after WWI plunged both into financial trouble. In 1923, Società Egiziana Fosfati was nationalised and revitalised with the opening of new pits in Gebel Duwi, twenty kilometres West of El Qoseir. The mines were now directed by Riccardo Decima, hailing from Agordo. Decima brought with him tens of fellow Agordinians from the Valle Imperina pyrite mines, shipped straight from the Alps to the Sahara (Pellegrini 2011). In 1933, the Italian government established IRI, to fill in the gaps that private industry would not cover in what was essentially a fascist variety of import-substitution industrialisation. IRI took over Società Egiziana Fosfati, and owned around 9-10% of Société des Phosphates Tunisiens' shares. In the 1930s, the Italian state thus directly controlled the El Qoseir mines and had a minority stake in the Kalaa Djerda mines.

The indigenous workers' perspective is conspicuously absent from the Italian and French archives. Yet it is possible to glean that the labour process in both El Qoseir and Kalaa Djerda was in line with the racialised labour regimes that obtained elsewhere in colonial mining. The managerial posts

⁹ ACS, Ministry of Agriculture (0782), 81.

were all filled by Europeans. The technicians, overseers, and skilled workers equally so, mainly Agordinians in El Qoseir and Sardinians (from the Sulcis-Iglesiente mining area) in Kalaa Djerda (Montalbano 2023, 115). The Arabs – both members of local tribes and migrants from further afield – were virtually all employed as ‘unskilled’ workforce.

The wage hierarchy was also racialised. According to Camillo Pilotti’s firsthand witness on Kalaa Djerda:

The miners are almost always on piecework. A European foreman chooses a few aides and labourers, European or indigenous [...] The pieceworker must pay his labourers with the remuneration conceded to him. For this category of workers, the pay is 3.5 francs per day for the Europeans and 2 francs per day for the indigenous. (Pilotti 1908, 20)

While phosphate was functional to ensuring cheap labour in Europe via the reduction of food prices, through a regime of relative surplus value accumulation, its extraction in the colonies was made possible by the super-exploitation of an even cheaper indigenous workforce, through a regime mainly based on absolute surplus value accumulation.

Under Decima, Società Egiziana Fosfati rapidly increased its yearly output from 120,000 tonnes in 1926 to 350,000 tonnes in 1930.¹⁰ However, as an IRI internal memoir lamented, El Qoseir was ‘disgracefully located beyond the Suez Canal’,¹¹ which the Anglo-French Suez Canal Company used as a black hole to siphon rent into their coffers. Therefore, it was more convenient to ship the phosphate to Japan than to Italy, as exports to Asia were exempt from the hefty Suez Canal fees. In the 1930s, Japan was Società Egiziana Fosfati’s number one customer, while Italy came second. As the Suez Canal stood in the way, El Qoseir’s phosphate only covered a small minority of Italy’s imports (see Figure 1).

Figure 1 – Italy’s phosphate imports by country of origin (tonnes)

	1933	1934	1935	1936
Algeria	8,488	7,998	2,416	0
Egypt	61,340	49,855	59,930	90,903
USA (Florida)	70,413	82,921	40,597	38,574
Morocco	215,958	217,785	233,524	248,547
Russia	4,838	48,726	50,376	89,000
Tunisia	295,180	268,674	271,006	326,913

¹⁰ ACS, IRI (5591), r4419.

¹¹ ACS, IRI (5591), r4425.

Source: ACS, IRI (5591), r4419.

Italy commanded a small share of North African phosphate extraction, and low-grade too, all in countries (Egypt and Tunisia) outside of its own empire. It is thus likely that the only significant ground rent Italy appropriated from phosphate extraction was that stemming from exports to Japan. Nonetheless, Società Egiziana Fosfati's CEO Vincenzo Fagioli and IRI's director Giovanni Malvezzi fruitfully used El Qoseir as a hinge to gain leverage in their negotiations with the French over phosphate trade agreements. These dynamics show how the European powers were simultaneously partners and competitors in the appropriation of colonial land and labour.

In 1917, the Khouribga phosphate reserves were discovered in Morocco, and the Office Chérifien des Phosphates (OCP) started exploiting them in 1921. Not only were these deposits much larger than those of Tunisia, Algeria and Egypt, they also yielded higher-grade phosphate. OCP, therefore, rapidly gained the capability to price its competitors out of the market, with the complicity of the decline in demand induced by the Great Depression. The French government, however, saw the closure of the Algerian and Tunisian mines as against its political interests. In 1933, it established the Comptoir des Phosphates de l'Afrique du Nord, a cartel that fixed phosphate prices at a level that was bearable for non-Moroccan producers. This kept the Algerian and Tunisian mines running, while allowing OCP to pocket handsome differential rents.

The Comptoir's policy, however, would have made phosphate dearer on the Italian market. Società Egiziana Fosfati's main goal – as part of state-owned IRI – was not its own profit maximisation (and thus rent capture) but cost minimisation for Italian fertiliser producers and farmers, through phosphate as Cheap Nature. In bargaining Società Egiziana Fosfati's relationship with the cartel, Fagioli lied that the Italian company could more than double El Qoseir's output if it so wished, and was thus allowed by Comptoir to export to Italy at the price it wanted. However, in 1936, Gustavo Donegani called Società Egiziana Fosfati's bluff. This infuriated Fagioli, who – in an internal memoir – accused Société des Phosphates Tunisiens' leader of being unpatriotically aligned with French capital and of sabotaging Società Egiziana Fosfati's arduous efforts to supply his younger brother with cheap phosphate:

Société des Phosphates Tunisiens' president exposed with substantial precision, albeit exaggerating somewhat, the various accidents that occurred in our company (strikes, shipping difficulties, tensions with the British authorities, etc.) [...] I do not blame Engineer Donegani because, as president of a French

company, he can act as he pleases (and I hope he behaves as he always did, sending his company to actual hell)...¹²

This quote is remarkable not only for its colourful language, but also because it mentions strikes at Società Egiziana Fosfati, an element otherwise rarely found in IRI's archives.

Meanwhile, the Libyan phosphate fever continued. In 1923, for example, Montecatini itself – in collaboration with Governor of Tripolitania Giuseppe Volpi – organised yet another unsuccessful exploration (Castelli 1927, 18). The Ministry of the Colonies thus took the matter into its own hands, and tasked Ignazio Sanfilippo to report on the state of the art on the supposed Libyan phosphate reserves. Sanfilippo submitted a memoir to the Ministry in February 1926, and also sent a copy to Mussolini himself, who expressed his gratitude.¹³ In the document, the engineer and entrepreneur concluded:

It is not on the existence [of phosphate reserves] – on which there can be no more doubt – that the phosphate question must be debated, but rather on the sound criteria and practical methods to make the reserves visible. [...] [O]ur strong and enlightened government will certainly take the appropriate measures, to free Italy from the heavy tribute it must pay to foreign countries and to open on Italian [Libyan] land new outlets for the proactive industriousness of our good working classes.¹⁴

Sanfilippo was persuasive enough. The government assigned him a new mission, funded by the Ministry of the Colonies, that departed in March 1929 (Francioni 1996). The Great Depression, however, dried up the government's finances and, in March 1931, the Ministry suspended the exploration. Nonetheless, the mission resumed in 1932. In November 1934, Professor Giuseppe Checchia-Rispoli – the geologist who analysed the mineral samples dispatched to Italy by Sanfilippo – finally gave the long-awaited announcement:

The news of the recent discovery, in Northern Tripolitania, of enormous phosphate mineral reserves will be learnt with great interest [...] Overcoming Sanfilippo's innate modesty, equal to his great merits, I thought it incumbent on me to spread the message [...] But the discovery of Libya's phosphate reserves must first and foremost be attributed to the unwavering determination of the fascist Government, always

¹² ACS, IRI (5591), r4419.

¹³ ASD, MAI, Affari Economici e Finanziari, M.

¹⁴ *Ibidem*.

eager to encourage and promote every enterprise aiming at our Country's prosperity. (Checchia-Rispoli 1934, 463-464)

It was, however, yet another Libyan phosphate chimera. Further analyses showed that the rocks in question displayed a grade of only 10-20%, much too low for viable exploitation. In modern parlance, Sanfilippo had found phosphate *resources* (the existence of a mineral in a geological formation), not phosphate *reserves* (resources of such quality that they can be economically exploited given the available technologies and the level of demand).

This is not just a story of over-confident scientists filled with civilisational zeal. In the 1930s, the moral depravity of Italian imperialism reached new lows. The regime, for instance, utilised chemical weapons – including gases manufactured by Montecatini – to crush the Ethiopian self-defence (Del Boca 2024) and committed genocide in Cyrenaica to isolate the Senussi rebels led by the legendary Omar al-Mukhtar (Ahmida 2006). Most Italian sources on the history of the country's chemical production are more or less blind to the relationship between the industry and the crimes of colonialism.

In 1936, the regime officialised its 'autarchy' policy, attempting to maximise Italy's economic self-reliance in the face of international sanctions. It will be clear by now that the country's dependence on imported phosphate was an Achilles' heel of this project. In light of this, in the same year, Governor of Libya Italo Balbo established a Geology and Mining Office in the colony to relaunch the explorations.¹⁵ Italy thus pursued its Libyan phosphate mirage until the eve of WWII. By June 1940, when the boot threw its first kicks in the global conflict, no exploitable reserves had been discovered in Libya. Balbo's explorations went no further, as – in that first month of war – his airplane was fatally gunned down by friendly fire.

There were nonetheless alternatives to the imaginary Libyan phosphates. In January 1939, the antifascist diaspora journal *L'italiano di Tunisi* denounced:

Montecatini urgently needs phosphate for its chemical products, and these are to be found precisely in Tunisia! [...] A small number of shark [profiteer] families (Mussolini, Ciano, Orlando, Donegani, Volpi, etc.) [...], unsatisfied with the slaughter of Italians in Ethiopia and Spain, want to throw the Italian people against France to exploit the Kef and Gafsa mines.¹⁶

¹⁵ ACS, IRI (5591), r4421.

¹⁶ *L'italiano di Tunisi*, 22 January 1939, 1-2.

This analysis aged well. As soon as Italy entered WWII, the British seized the El Qoseir mines and detained all Italian employees in internment camps. The Italians would be soon brought back, but to extract the mineral for the British. The regime was thus cut off, throughout WWII, from the only phosphate mine Italy fully owned. Yet the fascist government could still try the Kalaa Djerda card. Gustavo Donegani had died in 1937, and IRI's managers had not shed many tears for him. A May 1939 internal IRI report states:

The Kalaa Djerda mines employ many hundreds of Italians. [...] Even if – due to the unsympathetic attitude that the deceased Gustavo Donegani always had towards his country – it cannot really be said that until now Société des Phosphates Tunisiens constituted a centre of Italian influence, it cannot be excluded that – if we reinforce our shareholding position and diminish political tensions – this could happen.¹⁷

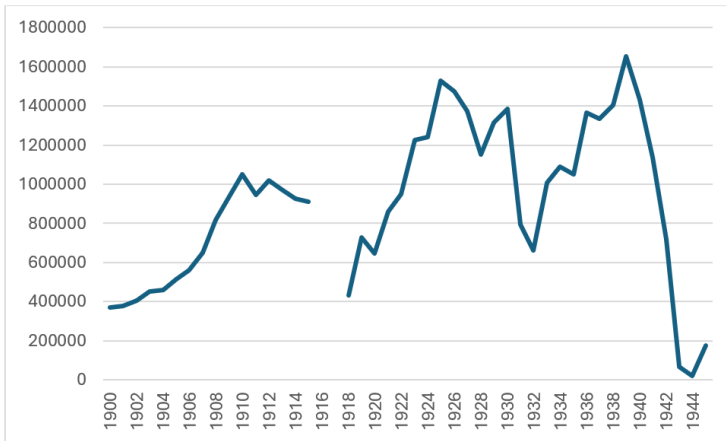
Political tensions were 'diminished' by Germany's invasion of France and the establishment of the Vichy collaborationist government. This did allow IRI to 'reinforce its shareholding position', increasing its Société des Phosphates Tunisiens ownership share. By 31 December 1941, it could be said that 'IRI has gained control, even if it owns just 30% of the company's capital'.¹⁸ But it was all in vain. Société des Phosphates Tunisiens' shipping terminal in Tunis was 'almost completely destroyed' by the fighting,¹⁹ and the 1943 'Tunisgrad' defeat of the Axis in North Africa terminally cut the supplies to fascist Italy. After exhausting the phosphate stocks, Italy's superphosphate production crumbled (see Figure 2).

Figure 2 – Italy's superphosphate production, 1900-1945 (tonnes)

¹⁷ ASD, IRI (5591), r4366.

¹⁸ ASD, IRI (5591), r4367.

¹⁹ ABI, BCI, IRI, 30.



Source: ISTAT 1958, 131.

Data for 1916 and 1917 is not available.

The phosphate dearth contributed to the crisis of Italian agriculture in WWII, with the production of wheat steeply tumbling from 7,104,300 tonnes in 1940 to 4,176,600 tonnes in 1945 and that of rice from 928,700 to 356,300 tonnes over the same period (ISTAT 1958, 106). The waning of the phosphate mirage thus painfully revealed that autarchy was a delusion too. The population was paying a heavy toll in terms of casualties, but also economic hardship played no small role in the collapse of fascist control on peasants and workers, many of whom joined the armed Resistance against nazi-fascism. Shortly after the killing of Mussolini, Guido Donegani was arrested by Italy's National Liberation Committee under the accusation of collaborationism with the fallen regime. Montecatini's president was acquitted in 1946, in a trial marked by the mysterious disappearance of the initial documentation with the charges against him (Bordoni 2022, 205-235), but he died the following year. The openly colonial organisation of the Mediterranean region would soon disappear too.

Conclusion

This article reconstructed Italy's role in the political ecology of phosphate in the first half of the 20th century. It demonstrated how phosphate became an *ante litteram* critical mineral to Italian policymakers because it was regarded as essential to national security while its supply was geopolitically fragile. The rise of phosphate as 'politicised nature' was embedded in the capitalist transformations of agriculture, and in Europe's imperialist conquest of lands for colonisation. In this setting, the appropriation of phosphate as a cheap natural resource was, on the one hand, conditional on the exploitation of the cheap labour of a racialised workforce (through a regime of absolute surplus value accumulation) and, on the other hand, a condition for the reproduction of cheap labour in the metropolis (through a regime of relative surplus value accumulation). In fact, phosphate was extracted by super-exploited indigenous workers in the colonies to reduce the gap between 'working period' and

'production time' in Europe's agriculture, thus enhancing the production of cheap food for the Old Continent's waged workforce. Phosphate thus became part of a colonial system of Cheap Nature appropriation and ground rent extraction (this latter aspect being prevalent for France, as the occupier of the best reserves). European powers were both partners and rivals in this endeavour, as shown by the relationship between Italy, France, and Great Britain. The competitive dynamics prevailed with the explosion of the world wars and such infighting within the Global North eventually paved the way for the national liberation movements of the Global South.

The fascist dream of a comeback of the Roman Empire faded together with the other, more established, varieties of European open colonialism. All North African countries became independent over the 1950s and '60s, and eventually nationalised their phosphate reserves. Nonetheless, if North Africa's political independence mitigated the uneven economic balance of power established by European colonialism, it did not erase it. Indeed, a key difference between capitalist imperialism and previous imperial systems is that the former generates a self-reinforcing dynamic of technological divergence (Amin 1976; Bambirra 1978). The Global North continued to dominate the technological frontier, so that the unequal exchange of labour and resources with the Global South remains today. This also applies to the political ecology of phosphate in the Mediterranean region. In the second half of the 20th century, countries such as Morocco and Tunisia gained control of their phosphorus rent and established their own chemical fertiliser industries. However, this happened at a time when these products had already broadly reached technological maturity and countries like France and Italy had come to see their environmental impacts as unacceptable within their borders. Further research is needed to shed light on these more recent dynamics.

Phosphate, as demonstrated, was an element in the competition for Cheap Nature among legacy and emergent industrial powers that contributed – as part of a much broader mosaic of other tesserae – to the outbreak of the world wars. If reflection upon the most calamitous bloodshed in history is of any help to understand the present, today's muscular tactics by core countries to secure natural resources – exemplified by Donald Trump's gambits for critical minerals in Canada, the Democratic Republic of the Congo, Greenland or Ukraine – risk expanding conflicts around multiple extractive frontiers. This is tragically clear in the genocide that the Israeli government has been committing, with Western weapons, against the Palestinian people in Gaza (IAGS 2025). In fact, consistent Global North support to Israeli policy is also explained by the role the latter has played in collaborating to secure hydrocarbon supplies, as a key US ally in the Middle East (Hanieh 2024). To stave off further escalation, pressure from below is needed to shift Western policy towards containing material consumption via the provision of public goods and services that minimise waste, reducing inequality, and accompanying a transition towards a more balanced international division of labour.

Ethical approval

The research for this article was approved by the Ethics Committee of Ca' Foscari University of Venice, and it did not involve human participants.

Conflict of interest

The author declares that he has no conflict of interest.

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Availability of data and materials

The archival documents used for this research can be accessed in the respective archives.

Biographical note

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