

MATERIAL MODERNITIES: ALUMINUM IN THE MAKING
OF A GLOBAL CULTURAL ECONOMY

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ABSTRACT

Although the human relationship with aluminum is short, the metal has affected our lives and societies more profoundly than perhaps any other. A light metal that does not corrode, aluminum is a key ingredient in airplanes, automobiles, and artillery—three industries that transformed twentieth-century society. As such, aluminum propelled Western modernity toward new understandings and cultural orientations within an increasingly globalized world. Yet as it became a defining ingredient of modernity, aluminum also helped entrench an unequal and racialized international order through extractive systems built on older infrastructures of exploitation. The aluminum supply chain that enabled twentieth-century modernity maps across an earlier transatlantic network that produced the enslaved human labor that was equally formative of our modern era. Racialized landscapes and labor at sites of raw aluminum ore extraction are central to Western modernity, though they are generally erased from its histories. Fully understanding Western industrial modernity requires centering the African lands and bodies that have shaped it, and correcting its destructive tendencies requires prioritizing alternative African visions.

KEYWORDS: Africa, decolonization, extractivism, aluminum, material cultures

Although African peoples and the African continent have been rendered largely invisible in histories of Western modernity, it is African bodies and lands that made this modernity possible.¹ “More than any other part of the world,” argues Howard W. French, “Africa has been the linchpin of the machine of modernity.”² By the same token, the racialization, colonialism,

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and dispossession that have characterized the West's relationship with Africa are not incidental to Western modernity; they are constitutive of it.³ West African gold financed the European age of exploration and African bodies fueled Europe's wealth-generating plantations. These enterprises in turn underwrote the rise of democratic and Enlightenment ideals.⁴

Since the early twentieth century, the material that has perhaps most thoroughly embodied Western modernity's problematic relationships with place, space, and race is aluminum. Aluminum, a light, malleable, and highly conductive metal that does not rust, has shaped the cultures, politics, and environments of modernity. Through the first half of the twentieth century, a growing aluminum production infrastructure enabled the rapid expansion of the automotive, aviation, and armaments industries, the electrification of entire continents, and a growing consumerism made possible by inexpensive aluminum packaging and cheap consumer goods. These material transformations, "driven by the modern cultural quest for mobility, lightness and speed," entrenched spatial inequalities, both through industrial infrastructures and practices of representation.⁵ Through the twentieth century, significant supplies of bauxite (raw aluminum ore) were sourced from Jamaica, Guyana, and the southern United States, but fully one third of global bauxite deposits are located in Guinea, West Africa, where the current bauxite boom is devastating lands, waterways, and communities across vast areas.

The most important nonferrous metal worldwide, aluminum is consumed in ever-growing quantities. In 2010, global primary aluminum production was 42,353 thousand metric tons; by 2020, annual production had risen by 35% to 65,296 thousand metric tons.⁶ The violence to human lives and natural landscapes that makes this scale of consumption possible is enabled by histories and cultural imaginaries that have placed these lands and peoples outside of modernity, rendering their sacrifice an acceptable condition of "progress." In the wake of the unspeakable violence of chattel slavery, whose lasting repercussions continue to destabilize African lives on both sides of the Atlantic, Western societies have systematically imposed their desires and visions of modernity on African landscapes and societies in the form of unfettered and iterative extractions.

At the same time, alternative definitions of modernity and desires for alternative futures arising from the African continent receive little serious consideration. Even as African societies disproportionately contributed to the emergence of industrial modernities and continue to pay disproportionately high social and environmental tolls as a result, Africa's own visions of alternative modernities have been systematically marginalized and erased.

As Senegalese scholar Felwine Sarr argues, the West's version of modernity is largely a project of "emancipat[ing] the individual" from the constraints of traditional culture via the Enlightenment ideals of rationality and reason.⁷ If this project has carried a portion of humanity toward unprecedented technological prowess, cultural achievement, and material wellbeing, it has also relied upon the imposition of violent inequalities, exploitation, and material extraction in wealth-producing hinterlands. As Sarr argues, the optimistic buzz concerning Africa's future, one in which it will become the "El Dorado of global capitalism," is in fact a dream "produced by others . . . in which those who are most concerned by the development were not invited to the collective dream."⁸ Throughout the twentieth century, former colonies gained their independence yet remained trapped within racialized global hierarchies that ensured the ongoing availability of raw materials from these regions for former colonizers and their allies. While Africans are hopeful for future prosperity, it is uncertain how many "share the same enthusiasm for . . . an economic order that will submit the world and its resources to a forced exploitation profiting only a small minority of benefactors, and thereby disrupting the balance of living conditions."⁹

This article argues that aluminum played a central role in constructing Western modernity and the uneven development that characterizes it. I build on Mimi Sheller's comprehensive research into the role of aluminum in shaping the values, aesthetics, and environments of global modernities. I then extend this work to argue that in linking bauxite-producing countries in West Africa and the Caribbean with centers of transformation and consumption in North America and Europe, the aluminum commodity chain that took shape through the first half of the twentieth century reproduced and further entrenched the exploitative relationships of the transatlantic slave trade and plantation economies of preceding centuries. That is, African lands and bodies have been as central to the formation of industrial modernity via the aluminum supply chain as they were to the emergence of the institutions and ideologies of Western liberal democracies via eighteenth-century plantations.¹⁰ I place these ideas into conversation with Felwine Sarr's critique of Western modernity from his position as a scholar of the Global South and his belief that Africa "must be prudent and extract itself from following the irresponsible path of globalization that could endanger the social and natural living conditions for all of human life."¹¹ Similar to other extractivist systems, the extraction of aluminum ore has proven devastating to the environments and public health of bauxite-producing nations that have realized few of the benefits of aluminum that wealthy nations enjoy. Yet it is within Africa's power, Sarr argues, to bring about a "civilizational shift" by refusing

to uphold untenable modes of production and the ideals that sustain them. Through this discussion, my investigation of the entanglement of culture, politics, and aluminum contributes to a growing scholarship on materials while insisting on the centrality of imperial and racial histories to human relationships with matter.¹²

The Material of Modernity

Unlike with gold, copper, bronze, and tin, the history of human relationships with aluminum is short. The metal was initially so difficult to isolate and produce that for decades it remained a commodity owned exclusively by an extremely wealthy class. It was only after 1886, following the development of the energy-intensive Hall-Héroult smelting process, that aluminum could be mass-produced.¹³ Its subsequent production on an ever-increasing scale transformed aluminum from precious to industrial metal, making it one of the first “truly global industries” and the metal that would most significantly shape global modernities through the twentieth century.¹⁴ Yet aluminum’s widespread uptake in transportation systems, architecture, and household goods would require savvy design innovations and the creation of a market for the metal by manufacturing a specific modern identity and aesthetic that would in turn create consumer desire. Design departments at aluminum companies produced an image and identity for the material, associating it with modernity and in turn giving shape and definition to modernity itself.¹⁵

The aluminum aesthetic, like various other consumer desires before and since, came with immense hidden costs that created social tensions in both centers and peripheries. As Frantz Fanon, Aimé Césaire, and others remind us, the simmering brutality and inhumanity of chattel slavery and colonialism that made possible the genteel veneer of European society eventually came home to the European continent in the form of two World Wars that profoundly transformed societies and their relationships in the decades that followed.¹⁶ Through the first half of the twentieth century, aluminum proved an essential material of the industrialized warfare that erupted in Europe and beyond. Light, strong, and versatile, aluminum formed not only the bodies of aircraft and armaments but also the explosive components of artillery. The metal quickly rose to prominence as a key strategic resource, the industry and supporting infrastructure developing and expanding alongside industrial warfare. As demand for aluminum surged through the Second World War, the massive energy requirements needed to meet wartime production

transformed Canadian river systems, flooding vast tracts of landscape and contributing to the ongoing dispossession and displacement of Canada's Indigenous peoples.¹⁷ In racialized global peripheries, including Jamaica, Guyana, and Guinea, bauxite extraction devastated environments while offering few of the benefits of the metal that wealthier societies enjoyed.

The constitutive cultural and material aspects of these events further entrenched a deeply inequitable global order in which vastly differing levels of prosperity are organized along racial lines. Although aluminum is the most abundant element in the earth's crust, it is unevenly distributed; most bauxite ore is found in tropical countries. However, while the extraction of raw bauxite ore has been located overwhelmingly in so-called developing countries for most of the industry's history, value-added aluminum production has been located in the Global North. Throughout the twentieth century, cheap bauxite was sourced mainly from the Caribbean and West Africa and refined into a valuable finished product in energy-intensive smelters located in North American and European hinterlands. For example, in 1972, Jamaica, Surinam, Guyana, and Guinea accounted for a total of 45% of world bauxite production but only 0.6% of aluminum production.¹⁸ Major aluminum producers such as Canada, Norway, and China rely almost entirely on imported bauxite. This arrangement of raw supply and value enhancement enriched northern centers of production while further calcifying inequitable and racialized international relationships.

In 1955, Jamaica was the leading U.S. bauxite supplier, but it was later surpassed by Guinea. Home to over 26% of the world's bauxite, Guinea had become the world's largest bauxite exporter and the most important U.S. source of the resource by the 1980s, furnishing up to 16% of sales on the global market and 45% of American imports.¹⁹ Despite its desire to produce value-added products, Guinea has remained an export hinterland, a source of cheap raw materials to fuel international markets and one of the world's lowest-income nations.²⁰ It may appear to be an accident of geology that Guinea's rich bauxite deposits are located around slave exportation ports on the Rio Pongo and Rio Nuñez. Yet as Kathryn Yusoff observes, geology is no accident; rather, it is "a relation of power" that "continues to constitute racialized relations of power . . . in mining, petrochemical sites and corridors, and their toxic legacies—all over a world that resolutely cuts exposure along color lines."²¹ The invisibility of poor, peripheral, racialized nations such as Guinea—despite their centrality to modern societies—is in large part due to particular modes of narrating history; such narrative practices are in turn driven by Western modernity's need to hide its inhuman undergirding.

The routine and casual looting of impoverished nations by the wealthy occurs in many industries. What distinguishes aluminum is the immense scale of transformation that it gave rise to—in terms of both natural and cultural landscapes—and the inequalities that it calcified in the process. Citizens of bauxite-producing countries have been among the last to enjoy the transformative goods and aspirations that cheap aluminum has made banal daily realities in wealthy nations. They have also borne the cost of values and aesthetics that amplified the growing trench between industrialized modernity and its others. As Sheller demonstrates at length, the cultural imaginaries of aluminum that juxtaposed images of modernity and representations of “developing” countries “reinforce[d] a geography of distinction” in which the countries that served as the source for bauxite were excluded from the ideas of progress and efficiency that aluminum enabled.²² Extractive sites make a particular version of capitalist modernity possible, even as this modernity actively works to hide its devastating machinations.²³

Discursive and Material Practices of Modernity

Felwine Sarr observes that modernity, “largely considered an ensemble of historical conditions that provide ways to think the emancipation of the individual vis-à-vis values arising out of traditional culture,” has been a project “of imposing reason as the transcendent norm for society instead of and in place of God, ancestors, or tradition.”²⁴ As many scholars have demonstrated, modernity is not a monolith; colonialism, migration, and other flows dispersed and mingled ideals of modernity heterogeneously, giving rise to diverse cross-cultural formulations.²⁵ Yet while the West cannot be seen as “the sole purveyor and agent of modernity,” the structures and processes established through centuries of material endeavors have nevertheless reinforced a particular world order and racial logic that, as a result of heavy investment in the built infrastructures of imperialism, are difficult to recalibrate.²⁶

Concurrent with the rise of aluminum and the advent of independence for African and Caribbean nations through the 1950s and 1960s, the cultural shifts ushered in by Western modernity—and largely enabled by abundant, cheap aluminum—included a pronounced transition from “the great cultural orientations” of the past toward a new reverence for the individual and the individual’s pleasure.²⁷ Aluminum links the phenomena of rising consumerism, mass electrification, cultures organized around personal vehicles and airplanes, and the restructuring of cities, households, and gender relations

with destructive infrastructures of extraction and production. Meanwhile, the optimism of the independence era soon gave way to disenchantment as many newly postcolonial nations struggled to achieve modernity's promises in the face of oftentimes repressive domestic politics and neocolonial international relations.

As Jürgen Habermas famously argued, modernity remains an unfinished project that must be continually revisited. This is particularly true in the wake of the series of disasters and atrocities that call Western modernity's ideas of reason and progress into question. At our current juncture, over a century into the aluminum age that has brought us flight, electricity, iPods, and industrial warfare, there is a need to forge a new sense of humanity within "a modernity gone awry" in which science and technology, from the perspective of many in the Global South, have primarily produced "inequality, poverty, and feelings of abandonment."²⁸ A teleological view that sees modernity as a steady march of progress toward ever-increasing degrees of technical sophistication ignores the vast inequalities and perpetual deficits that are intrinsic to this vision. This teleology drives a situation of perpetual "striving to catch up" for those on the fringes of modernity, in which various international rankings serve as a constant reminder of the hierarchy of modern nations and their others.²⁹ The West's version of modernity, imposed on colonized regions in both social and environmental terms, devalues the cultures and traditions it encounters, and Sarr calls for vision and imagination to break free of these impositions.

Redefined modernities more accountable to inequitable global relationships and the difficulties they create for Africans in particular must do more than produce discourse and cultural imaginaries inclusive of Western modernity's others. As Eve Tuck and K. Wayne Yang remind us, decolonization is not a metaphor; just as anti-colonial efforts to redress cultural and discursive aspects of colonialism are not the same as land restitution, discursive efforts alone are inadequate to address the physical violence made manifest in the structures and materials of modernity.³⁰ As well as cultural and representational shifts, the *material* conditions in former colonies of the Global South are in urgent need of change. Such change will require transformations within global political structures that perpetuate highly inequitable relationships within material supply chains.

Andrew Barry ponders the relationship between metals and politics, reflecting, "If the malleability of metals was once viewed as an index of the transformative capacities of capitalism, today metals seem to have disappeared from view. We live, according to many theorists, in a world marked by flows of knowledge and information, but materials are no longer of much

interest.⁷³¹ If metals are merely part of the background noise of modernity, the histories and social assemblages surrounding their production and transformation are also largely out of view. Metals are not alone in this, of course; the conditions at sites of extraction are generally invisible to end users of any given material, whether airplanes, plastic bags, or toilet paper. Yet aluminum, a metal that does not rust, is a material entwined with erasure and subterfuge in particular ways. The aluminum age offered the possibility of a world where the passage of time leaves no marks. Surely it is no coincidence that such a substance would be a defining component of a modernity captivated by efficiency, entranced by youth and the fantasy of immortality. Like other twentieth-century materials of improbable durability, aluminum's availability is made possible by networks of extraction and production that remain unseen thanks to the systems of domination and uneven development established during earlier periods of history. Rustless, transmutable, easily recyclable, aluminum is a background material that encourages forgetfulness when it comes to the conditions of its extraction and manufacture.

In her cogent scholarship on the role of aluminum in shaping modernity, Mimi Sheller calls for a fundamental shift in cultural orientation to address its various harms. Her ambiguous "we" leaves undefined who is best placed to undertake this work, yet it suggests an audience mainly comprising educated, middle-class Americans—the class whose material and cultural imperialism gave rise to a society that consumes more resources per capita than any other society at any time in history. I argue instead that what is needed now is the larger project of global re-visioning that Felwine Sarr calls for: a broader, multinational imagining that opens modernity beyond the West and specifically draws on African strengths and visions. Such visioning could offer both imaginative and political space to correct the historical exclusion of modernity's others, who have been at best forgotten and at worst systematically degraded and silenced. Aluminum and its inequitably distributed costs and benefits demonstrate that as we look to the redefined modernities of the future, we must also learn from the long *durée* of material histories that produced the severe inequalities and damaging social relationships of our contemporary world.

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Notes

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1. This argument forms the basis of the recent book by Howard French, *Born in Blackness: Africa, Africans, and the Making of the Modern World, 1471 to the Second World War* (New York: Liveright, 2021), which in turn builds on earlier work by W. E. B. Du Bois, Frederick Cooper, Michael A. Gomez, Patrick Manning and other historians who argue that Africa plays a central, rather than peripheral, role in world history.

2. French, *Born in Blackness*, 6.

3. This argument forms the core of many works of scholarship; for example, *The Racial Contract* by Charles W. Mills opens with the statement that “White supremacy is the unnamed political system that has made the modern world what it is today” (Ithaca: Cornell University Press, 1997), 1. Hannah Appel, in *The Licit Life of Capitalism: U.S. Oil in Equatorial Guinea* (Durham: Duke University Press, 2019), provides a detailed account of how ongoing extraction from the African continent is enabled by the legitimating political and economic infrastructures of capitalist modernity, including contracts, governance, and the corporate form, that are in turn built upon histories of inequality and racializing cultural imaginaries.

4. See, for example, C. L. R. James, *The Black Jacobins: Toussaint L’Ouverture and the San Domingo Revolution* (New York: Vintage Books, 1989); Achille Mbembe, *Necropolitics* (Durham, NC: Duke University Press, 2019); and Christopher L. Miller, *The French Atlantic Triangle: Literature and Culture of the Slave Trade* (Durham: Duke University Press, 2008).

5. Mimi Sheller, *Aluminum Dreams: The Making of Light Modernity* (Cambridge, MA: MIT Press, 2014), 30.

6. Website of the International Aluminum Institute, accessed July 15, 2021, <https://www.world-aluminium.org/statistics/>.

7. Felwine Sarr, *Afrotopia*, trans. Drew S. Burk and Sarah Jones-Boardman (Minneapolis: University of Minnesota Press, 2019), 12.

8. Sarr, *Afrotopia*, x.

9. Sarr, *Afrotopia*, x–xi.

10. See James, *Black Jacobins*; and Mbembe, *Necropolitics* on the history and theory of linkages between plantations and the institutions of liberal democracies.

11. Sarr, *Afrotopia*, 115.

12. See Prasad and Maraj’s critical intervention on new materialist scholarship that, in attempting to put matter on equal ontological footing with humans, “risks denying the material traumas, histories, and practices of knowledge-making of racialized peoples who have never enjoyed access to dominant, racialized constructs of humanity/ the human in the first place” (329). Pritha Prasad and Louis M. Maraj, “I Am Not Your Teaching Moment’: The Benevolent Gaslight and Epistemic Violence,” *College Composition and Communication* 74, no. 2 (2022): 322–351.

13. Developed simultaneously by Charles M. Hall in the United States and Paul-Louis-Toussaint Héroult in France, the Hall-Héroult smelting process is the second stage of aluminum production in which purified alumina is dissolved at high temperatures (950°C or 1750°F) and electrolyzed to separate the aluminum and oxygen components of alumina. The initial phase takes place in alumina refineries using the Bayer process, in which a caustic soda solution dissolves impurities, leaving white alumina powder.

14. Ronald Graham, *The Aluminium Industry and the Third World: Multinational Corporations and Underdevelopment* (London: Zed Press, 1982), 14.

15. See Sheller, *Aluminum Dreams*, chap. 4, for a detailed discussion of how design departments at aluminum corporations shaped modern values and aesthetics.

16. Frantz Fanon, *The Wretched of the Earth*, trans. C. Farrington (London: Penguin Classics, 2001); Aimé Césaire, *Discourse on Colonialism*, trans. Joan Pinkham (New York: Monthly Review Press, 2000).

17. Matthew Evenden, "Mobilizing Rivers: Hydro-Electricity, the State, and World War II in Canada," *Annals of the Association of American Geographers* 99, no. 5 (2009): 845–55; Matthew Evenden, "Aluminum, Commodity Chains, and the Environmental History of the Second World War," *Environmental History* 16, no. 1 (2011): 69–93.
18. Isaiah A. Litvak and Christopher J. Maule, "Cartel Strategies in the International Aluminum Industry," *Antitrust Bulletin* 20, no. 3 (1975): 641–63.
19. Ross Pearson, "The Jamaica Bauxite Industry," *Journal of Geography* 56, no. 8 (1957): 377–85; Bonnie Campbell, "Le secteur de la bauxite en République de Guinée: Ajustement structurel et restructuration internationale de l'industrie de l'aluminium," *Revue Tiers Monde* 34, no. 133 (1993): 187–208.
20. Bonnie K. Campbell, *Les enjeux de la bauxite: la Guinée face aux multinationales de l'aluminium* (Montréal/Genève: Presses de l'Université de Montréal/Institut Universitaire de Hautes Etudes Internationales de Genève, 1983).
21. Kathryn Yusoff, *A Billion Black Anthropocenes or None* (Minneapolis: University of Minnesota Press, 2018), 10.
22. Sheller, *Aluminum Dreams*, 104.
23. Appel, *The Licit Life of Capitalism*.
24. Sarr, *Afrotopia*, 12.
25. Examples that illustrate the varied and long-standing scholarship on multiple modernities include Kalpana Ram and Margaret Jolly, eds., *Maternities and Modernities: Colonial and Postcolonial Experiences in Asia and the Pacific* (Cambridge: Cambridge University Press, 1998); and Michaela Moura-Koçoğlu, *Narrating Indigenous Modernities: Transcultural Dimensions in Contemporary Māori Literature* (Amsterdam: Rodopi, 2011).
26. Sarr, *Afrotopia*, 16.
27. Sarr, *Afrotopia*, 13.
28. Sarr, *Afrotopia*, 15.
29. Sarr, *Afrotopia*, 21.
30. Eve Tuck and K. Wayne Yang, "Decolonization Is Not a Metaphor," *Decolonization: Indigeneity, Education & Society* 1, no. 1 (2012): 1–40.
31. Andrew Barry, "Materialist Politics: Metallurgy," in *Political Matter: Technoscience, Democracy, and Public Life*, ed. Bruce Braun and Sarah J. Whatmore (Minneapolis: University of Minnesota Press, 2010), 89.