Clay is EVERY~~WHERE~~THING:
Mapping Clay as Extraction, Heritage, and Resistance through the Transatlantic Slave Trade

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To understand clay is to understand climate. It is to understand the wetness of the earth, the composition of the soils, erosion in the movement of air and rock, and the strength of the sun and heat. However, due to urbanization and modern forms of mineral extraction, the artistry and localization of the connection between clay and climate has become buried by extreme resource extraction, exploitive open pit mineral mining, and a move from local culture to urbanization, exportation, and the globalization of materials for profit.

Found in weathered areas such as riverbanks and on the ocean floor, and formed from the gradual erosion of rocks as water and air sweep over them (Environmental Characteristics of Clays and Clay Mineral Deposits 2009), clay holds the history of the earth. It is commonly composed of aluminum or magnesium silicates, and is more closely defined by its fine particle size, material plasticity, and layering of tetrahedral atomic sheets than its chemical makeup (Clay, 2025**)**. Carved from wetness, it defies colonization and control of the earth's waterways. Clay is birthed in the gray area between the flow of water and the saturation of wetness, with both apparent in its composition and plasticity. At the riverbanks' bend, clay takes on a plastic form, shifting shape and molding to human touch as a lifeline to climate, culture, community, and survival. Unique and striking interstratified clay minerals composed of separate, layered atomic sheets in patterns ranging from formulaic to random (Clay, 2025**)** show the movement of earth's forces and the relative delicacy of the soil below.

What was once a link between communities and climate, clay has become a key mineral for industrialization, urbanization, and energy. Modern technology for extraction and acceptance of environmental degradation has shifted the focus away from culture and a connection with the land to rapid growth, mining, and exploitation. Today, as global clay markets continue to expand, clay is used to enhance urbanization through sourcing for construction, ceramics, packaging, heat generation, and even energy storage and carbon removal. In the United States alone, an estimated 37.6 million tons of clays are consumed each year for pottery, water absorption, construction, and extreme heat refractory products in a rapidly growing market currently valued at over $5 billion (*Environmental impact of open-pit mining,* 2023), (Clay Market Size And Forecast, 2024)**.** The global clay market, including extraction, processing, and sales, is currently valued at $52.73 billion, and is expected to exceed $73 billion by 2030, growing over 5% each year due to increased use in a variety of industries. This growth is driven by the reliance on clay for manufacturing and consumer products across multiple industries and markets: "the necessity of clay is underscored by its extensive use across several industries, including ceramics, construction, paper, paints, and rubber, indicating a diverse end-use scope" (*Clay market size, competitors, Trends,* 2024). Up to 40% of this growth is expected to come from economies in the Asia-Pacific region, where a construction boom due to rapid urbanization is leading to increased demand for clay-based products (Technavio, 2024).

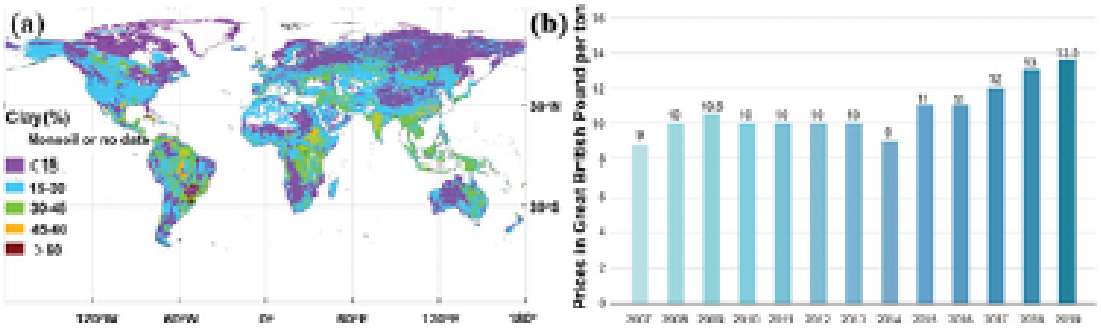
Within the construction industry, the fastest growing industry globally due to rapid global urbanization, clay is increasingly used as a partial replacement for cement due to cement's limited availability, high energy usage, and large greenhouse gas emissions. Clay is both functional and aesthetic in design; it is commonly appreciated for its load-bearing strength, breathability, protection from weathering due to its unique chemical structure and layering, and beauty due to its colorful varieties, malleability, and material plasticity (Constrofacilitator, 2023). Building on techniques from as early as 4,500 B.C., the modern construction industry utilizes clay to reduce emissions, increase the lifespan of new builds, decrease costs,

and reduce industrial waste. In regions with high climate variability, including the subtropics and climates with freezing and thawing cycles, high quality clay bricks offer climate-resistant, durable alternatives to cement (Singh, 2022)**.** Encompassing drilling, bricks, roofing, tiles, insulation, pavement, and weatherproofing, clay is inescapable in and unextractable from modern urban industry and society. Clay is not only fundamental to bricks and tiles, leading to increased demand in developing economies, but offers opportunities for sustainability and more eco-friendly construction practices, leading to a resurgence in its use in urban renovation and enhancement (*Clay Market Size And Forecast,* 2024). Growing, high speed industrialization outpaces the gradual formation of clay, leading to over-extraction and exploitation of this limited natural resource.

Further, normativity of mass production and overconsumption, fueled by urbanism and industrialization, lead to increased demand for clay in non-industrial markets including ceramics, cosmetics, pharmaceuticals, packaging, clothing, and food storage. Growth in demand for these markets is intrinsically tied to urbanization, as a growing middle class, increasing disposable incomes, and ease of access in urbanized spaces lead to increased accessibility of the markets. Economic and aesthetic trends towards natural materials and sustainability in cosmetics, agriculture, and insulation increase demand for clay in these industries, expanding open-pit mining in many parts of the globe (Clay Market Size And Forecast, 2024).

Use of clay in climate-related issues is expanding, as are environmental trade-offs related to greenhouse gas emissions and resource availability. Current uses include waste confinement and management due to its impermeability (Norris, 2017), as well as water treatment and pollution removal (Rytwo et al., 2012). In a climate altered future, clay is being explored as a solution for battery and energy storage, low-carbon development, and carbon removal from the atmosphere and ocean. With distributed energy resources (DER), including localized solar power and wind power, taking on a greater role in the energy transition, the need for local energy storage is more pressing than ever (Grant et. al, 2024). Clay has been studied as a promising material for energy storage, as it is a relatively cheap method of energy conduction and conversion. Clay's unique porous structure and stability to thermal and mechanical resistance, as well as its ability to effectively store and convert energy, offer major potential in the fast growing renewable energy industry.

Additionally, a 2023 study at the Sharma Lab at Dartmouth College explored the use of clay minerals for carbon sequestration on the surface of the ocean to remove dissolved organic carbon, therefore reigniting the marine biological pump of the ocean to sequester excess carbon (Sharma, n.d.). Due to its relative abundance as a natural resource, specifically in areas of the Global South including South America, India, and Africa, and its relatively low price, clay offers a solution to increasing energy demand and the need for increased storage capacity due to intermittency of renewable energy sources, as well as for carbon sequestration, waste management, and other environmental imperatives. However, this does not take into consideration the effects of clay mining and extraction. As additional environmental uses of clay are explored, environmental impacts of resource extraction must be considered. While material sustainability and pollution regulation promote the use of clay as a replacement for higher emitting materials such as cement or synthetics, this increasing reliance threatens resource sustainability and depletion.



Global map of clay minerals in soil and price of clay market.
Source: Lan, Y., Liu, Y., Li, J., Chen, D., He, G., & Parkin, I. P. (2021). Natural clay-based materials for Energy Storage and conversion applications. Advanced Science, 8(11).
https://doi.org/10.1002/advs.202004036

Trends of rapid urbanization and development do not adhere to spatial assumptions of urbanism, reshaping not only urban landscapes, but permeating rural, resource-rich landscapes as well. Severe environmental impacts include large uninhabitable swaths of land, biodiversity and ecosystem destruction, water and air pollution, and disturbances to soil composition**,** (*Environmental impact of open-pit mining,* 2023 (Turrión et al., 2021). For example, land use conversion due to urbanization has had significant impacts on soil composition and carbon storage within soils, and has homogenized soil profiles across urban landscapes. Surface soil composition has transformed along with urbanization, improving its ability to support built environments and decreasing its ability to support ecosystem services. This transition has reduced soils' ability to act as a carbon sink, leading to compounding environmental impacts (Herrmann et al., 2020). Additionally, to keep up with increased demand, industrial open pit mining and other environmentally harmful techniques are used to extract clay across the globe. While modern manufacturing methods reduce environmental impacts and improve the quality of clay materials, they also separate industry from nature and lead to severe environmental degradation. Modern clay extraction and processing is an invasive process, involving mining, drilling, and environmental degradation from greenhouse gas emissions throughout the processing cycle (Clay Processing, n.d.). Open pit mining, the most common industrialized extraction process, leaves a landscape dotted with scars, tracing the impacts of urbanization across space and time.

The industrialization of clay and other minerals can be mapped across the globe spatially and temporally, beginning with European colonization of the Americas and Africa and the transatlantic slave trade. The transition from localization to globalization of material resources in a rapidly developing and urbanizing world is rooted in these systems founded on exploitation and extraction of natural resources, people, and cultures. Similarly, just as the colonization of lands and peoples and limitless natural resource extraction can be tied to the transatlantic slave trade, heritage as resistance through clay pottery is entangled in the mass extraction of people, cultures, and materialism.

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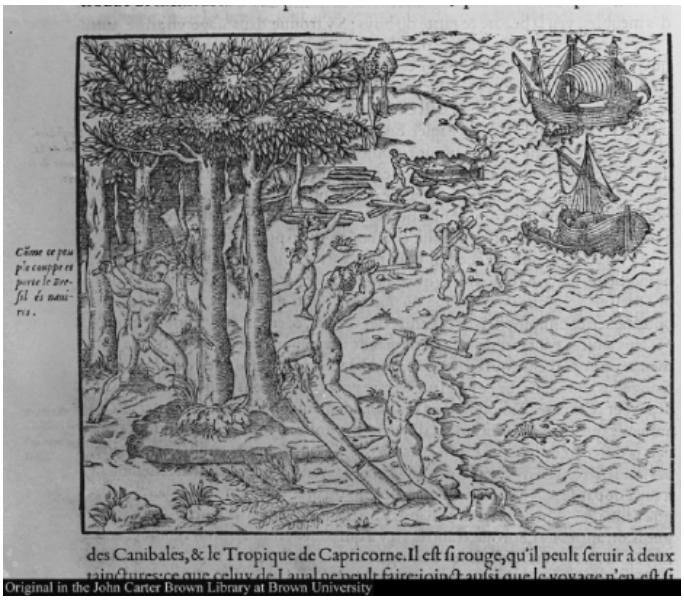
To examine the historic role of clay as resistance to extraction and colonization, we should first step back to map the transatlantic slave trade, then examine the role of clay in preserving culture and heritage, before zooming in on regional case studies of modern-day Quilombos in Brazil and enslaved potters in 19th century Edgefield, "Pottersville," South Carolina. We trace clay through its historical role in ceramics and

pottery, and eventually end back on the streets of an industrialized New York City on crowded cement roads and extractivist museum galleries. In these galleries, including a recent exhibit at The Whitney Museum of American Art, *Edges of Ailey,* focusing on Alvin Ailey's work as resistance against colonization and extraction, we examine the materiality of culture and Blackness in the Americas through sculpture, space, and dance. At some moments we trace clay as pottery, at others as heritage, at others as resistance, and finally as an imaginary of resilience.

We view clay as necessity and clay as design that both shapes and is shaped by society. Lastly, we challenge clay as a mineral resource, as extraction and exploitation, and as modern pipelines of colonization, globalization, and urbanism. An overlay of climate justice analyzes what makes Ailey's work limitless compared to the exploitative nature of clay extraction. Throughout, in the spirit of Alvin Ailey and his inspirations, we trace clay as wetness and movement, and strive to return to localization and land connection over mass extraction and clay as a marker of heritage and resistance.

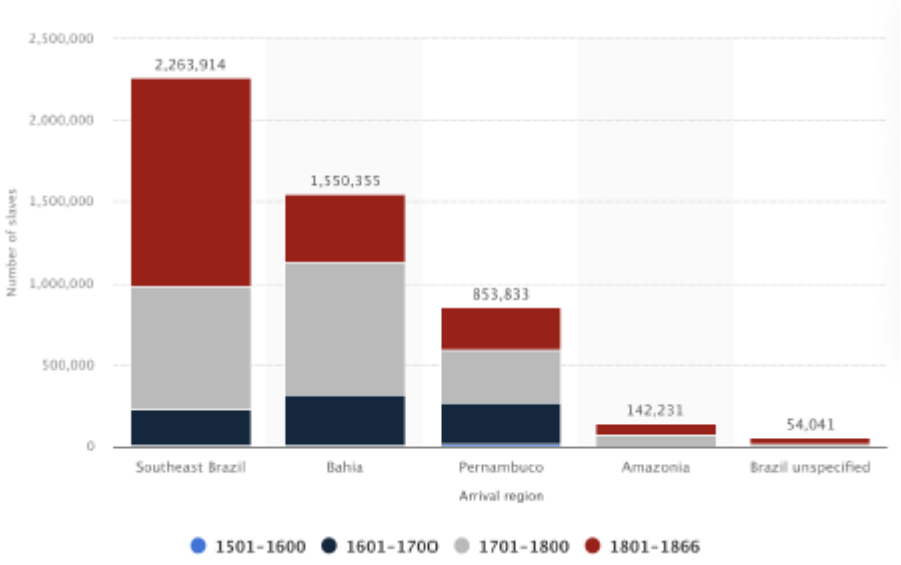
To fully understand clay, one must go beyond its materiality to understand clay as an active preserver of culture and heritage. We can trace clay along its journey from riverbanks to ceramics, unearthing the earliest emergence of West African pottery in Mali from 10,000 B.C. (Huysecom et al., 2009) to evidence of female artistry of Nok Terracottas in Nigeria in 500 B.C. (Berns, 1993), through the transatlantic slave trade to Afro-Brazilian quilombos, Indigenous-African-Portuguese influence in 1620s ceramics in the Macacu Valley North of Rio de Janeiro (Coelho Trindade & André Torres de Souza, 2022), and the Bakongo *dikenga* marking of present day Congo found on pottery in Brazilian sugar plantations and from Edgefield, South Carolina (Joseph, 2016). Through this journey, we trace not only clay as a mineral, but pottery as imaginaries of decolonization and resistance against Portuguese and broader European rule.

Portuguese colonization of present-day Brazil from 1500 to Brazil's independence in 1822 was characterized by extractionism and materialism; from the first permanent colonial settlement founded on the exportation of Brazilwood to the mining, cultivation, and exportation of cotton, sugar, gold, and diamonds in the late 16th century (*A brief history of Brazil,* 2006), (*A chronology of Brazilian history,* 2022), the colony's practices prioritized stripping the land of natural resources for profit. Current patterns of exploitation and extraction are apparent in these histories of injustice, as are aspects of Brazilian art, music, racial dynamics, and economic systems. Entangled in these histories is the transatlantic slave trade, through which Brazil is estimated to have enslaved approximately 40% of the 10 million Africans kidnapped from the 1500s to the 1860s (Report & Borges, n.d.). While the United States is often seen as a centerpoint in the transatlantic slave trade, Brazil is estimated to have kidnapped nearly 5 million enslaved people, over 10 times the number taken to United States and Canada (Reist, 2015).



"How the People Cut and Bring the Bresil to the Ships" by André Thevet (1575). Courtesy of the John Carter Brown Library's Archive of Early American Images. Source: Brazilwood: Brazil Five Centuries of Change. (n.d.).

As a major port city and hub of the slave trade in the Americas, Rio de Janeiro was the destination for an estimated 2.3 million enslaved Africans, or one in five people taken to the Americas, not including an estimated 300,000 who died during the voyage (Franca, 2015). They were mainly from Angola and the Bakongo region of West Central Africa, as well as occasional shifts to present-day Nigeria and Benin in West Africa, which has been traced through multiple forms of cultural preservation and documentation. A major factor in Rio's extreme participation in the slave trade was the relatively cheaper price of the journey from West Central Africa, as well as its popularity as a destination for both early sugar and later coffee plantations (Reist, 2015). It was commonly noted that "without sugar, no Brazil, without slaves, no sugar, without Angola, no slaves," alluding to the dependence of the Portuguese on the Brazilian colony for material resources and the dependence of Brazil on the importation of enslaved Angolans (Schwartz, 1996). While the slave trade waned in other places, it intensified in Brazil during the 19th century until its abolition in 1866, leading to an especially recent history of slavery in the country, which is understood to have continued informally through the 1930s (Report & Borges, n.d.).



Source: Slave arrivals from Africa to Brazil by region 1561-1856 | statista. (n.d.). https://www.statista.com/statistics/1150572/number-slaves-arrived-in-each-region-of-brazil-from-africa/

Clay plays an important role in mapping the transatlantic slave trade, as Portuguese, Bakongo and Basimbi, and Indigenous influence seen in Brazilian ceramics indicate extraction, settlement, enslavement, labor, gender, and class. One such influence is the Bakongo *Dikenga* of the Basimbi community in West Africa and West Central Africa, found on pottery in both Brazilian sugar plantations and David Drake's pottery from Edgefield, South Carolina. Tracing this clay marking from Congo to Brazil and South Carolina offers important insight into identity and heritage as resistance to the transatlantic slave trade through the preservation of culture and ritual. In both locations, these marks served as cultural identifiers, resisting enslavement and taking ownership over creations for which enslaved people did not have control. Further, they promoted resistance in unity, as recognizable markings could be found on pottery throughout multiple regions. Other markings on pottery, including parallel slashes, communicated alternate messages such as the presence of runaways or transitions to the new world (Dikenga). In addition, ceramics from the 17-19th centuries in the Macacu Valley north of Rio de Janeiro, a common agricultural production site during the colonial period in Brazil, indicate an ethnogenesis of Indigenous, African, and European culture (Coelho Trindade & André Torres de Souza, 2022). This evolution of a new identity signifies ways in which pottery can be used to map transformation in culture, resistance, and resilience.

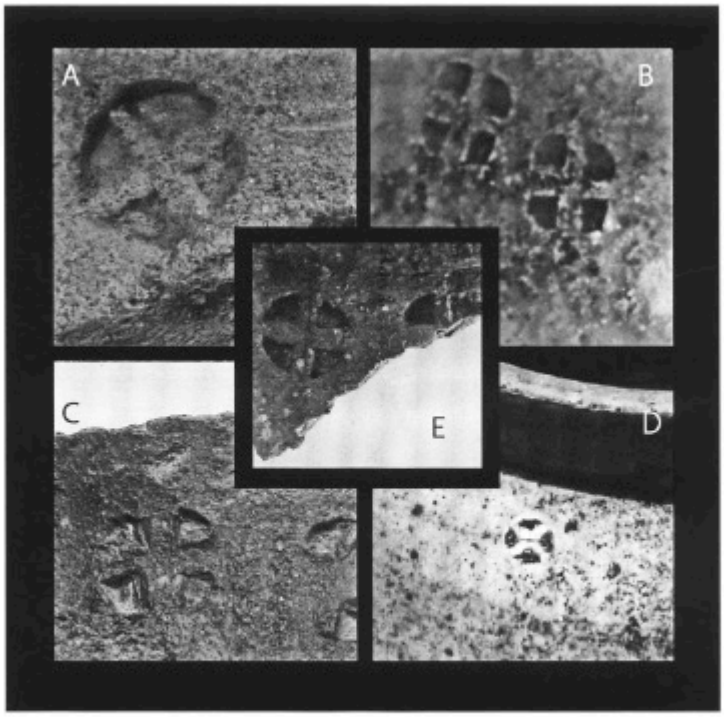


FIGURE 4. A gathering of *dikengas*. Examples of *dikenga* marks on colonoware from South Carolina and Brazil, and on stoneware from the Edgefield District: (*A*) impressed circle-and-cross mark on colonoware from Dean Hall Plantation, South Carolina (Photo courtesy of Nicole Isenbarger); (*B*) impressed circle-and-cross mark, made with four punctates, on stoneware from the Edgefield District, South Carolina (Photo by author); (*C*) impressed circle-and-cross mark made with four punctates, on colonoware from Dean Hall, South Carolina (Photo courtesy of Nicole Isenbarger); (*D*) impressed circle-and-cross mark on stoneware from the Edgefield District, South Carolina (Joseph 2011); and (*E*) impressed circle-and-cross mark on colonoware from Chapada Sugar Mill, west Brazil (Photo courtesy of Luis Symanski). (Figure prepared by David Diener, New South Associates, 2015.)

Source: Joseph, J. W. (2016). Marks from the past, signs of the future—the Dikenga of historical archaeology. Historical Archaeology, 50(3), 5–23. https://doi.org/10.1007/bf03377331

Pottery as Land Connection and Resistance in Brazilian Quilombos

The rise of Quilombos, evidenced as early as the late 16th century, held pockets of Afro-Brazilian resistance to colonization, enslavement, and exploitation. For many Quilombolas, clay was and continues to be more than just a material, but a way of life. It is a connection to climate, art, food, housing, and community, and dictates political and social systems including gender, labor, culture, and spirituality.

For the Quilombo of Itamatatiua in the State of Maranhão in Northeastern Brazil, ceramics not only offer insight into cultural relationships between regional Indigenous and Black populations, but provide social structures related to age, gender, and labor. While pottery in Itamatatiua was originally assumed to have broad colonial influence, recent studies have identified significant Indigenous influence within the Afro-Brazilian community, indicating cross-cultural influence within the community. For example, while potters used traditional European closed ovens in contrast to Indigenous open burning techniques, the European lathe machine has still not been incorporated within the potters' practice (Bandeira et al., 2022). Ancestral knowledge continues to prevail at the core of ceramic production in the Quilombo, connecting current laborers to past traditions and decolonial practice.

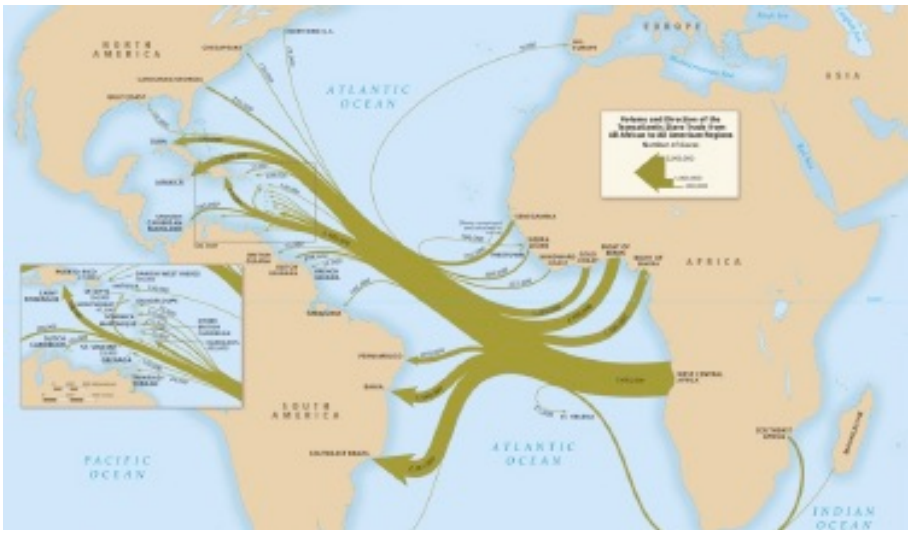
Although ceramics have been a significant part of life in Itamatatiua since "tempo dos antigos," or "the time of the ancient ones," the recent development of the Centre for Ceramic Production within the territory has called into question the idea of Quilombo Heritage and the role ceramics plays within it. Connection with the land, shared labor, and conviviality are considered crucial to Itamatatiuense heritage, and are inextricable from political and social organization around constitutional rights to the land. Within Itamatatiuense pottery, produced by females and elders in the community, motifs related to the land are common, providing a physical representation of this heritage (Hatzikidi, 2020**)**. Whereas national Brazilian heritage is often seen as exclusionary to Indigenous and Afro-Brazilian populations, Quilombo heritage defies this notion and offers a plurality of heritages that serve as resistance to mainstream colonial ideals. The tangibility of this heritage through cultural production of pottery assigns materiality to political and social systems within the Quilombo, providing both insight into these practices and tangibility of the intrinsic ties between culture and land connection.

Similarly to the Quilombo of Itamatatiua, 21st century clay pottery and oven making in the Quilombola communities of Maruanum in the Amazon and Ausente in Southeast region of Brazil show the physicality of Afro-Brazilian heritage and culture. In Maruanum, clay and pottery production provide access to life as the main source of income and a physical embodiment of heritage. Pottery is exclusively produced by elderly women in the community and centers around spirituality through connection with "Mãe do Barro," or the Clay Mother. Mãe do Barro is involved in all aspects of clay extraction from locating the clay in the land to determining the quality and quantity of clay for a year's production. Historic successes in pottery production have instilled in the community "wealth of knowledge and highly technical empirical procedures that are seamlessly encoded in an ethical conduct towards Mãe do Barro and the landscape, establishing a rationale that connects the landscape, humans, and non-human beings" (Blikstein et al., 2024). With clay as a link between climate, spirituality, and social and political hierarchies, the Quilombo of Maruanum has developed an intrinsic sense of land connection and protection. In order to not upset Mãe do Barro, clay is harvested only once per year after the rainfall season, and is then stored in potters' houses. Only the purest women, not including those who are pregnant, sick, menstruating, or in mourning, are involved in the extraction, and they follow a series of precautions to protect the land. The community has turned down previous offerings of extraction machinery as to not disrupt Mãe, and all contamination or

blemish is attributed to upsetting her (Blikstein et al., 2024). These traditions, tied to Quilombolo spirituality and heritage, portray a vision of clay extraction in which environmental protection, land connection, sustainability, and harmony with non-human beings are prioritized. They offer a path forward that resists urbanization, exploitation, and globalization and values clay as a gift from the land rather than utilizing it as a limitless resource for extraction.

In the Quilombo of Ausente, pottery making centers around traditional clay ovens and baking, exemplifying collectivism, female solidarity, and mutual support. Oven making not only provides food and sustenance for the community, but is used as a method of solidifying collective bonds between women that are typical in Quilombo culture. Production is viewed as both practical and political, and "reflects a broader narrative of Black women in Brazil actively resisting the erasure of their cultural significance" (Blikstein et al., 2024). Through traditional clay oven making, women in Ausente move beyond technology as a solution to common problems and inhabit organic roles within production that embody cultural norms, significance, and heritage. Traditional clay oven making represents Quilombo heritage as a challenge to colonial structures and positions Black women as a celebration of this resistance. For these communities, the importance of clay and making processes is not just about the physicality of the material, but the histories it represents.

In Ausente, processes surrounding clay extraction and production stand in opposition to political and social systems embedded in colonization. Relationships between black women in Ausente within the oven-making process "resemble perspectives central to Black feminism in the US, which understands that Black women, subject to the intersectionality of gender, race, and class, have always been integrated into the world of work" (Blikstein et al., 2024). Rooted in the compounding oppressions of race, gender, and class, Black feminism exists as revolutionary practice against histories of slavery and colonization. Through this heritage, we can continue to trace decolonial resistance along the transatlantic slave trade to 19th century Edgefield, South Carolina and the adjacent Low Country. Commonly referred to as Pottersville, Edgefield county was known for manufacturing of pottery and ceramics by enslaved Africans. They are tied to Brazilian Quilombo communities through both shared ancestry, as can be traced through the dikenga symbol on the pottery, and through shared manifestations of resistance and rebellion.



Origins of clay for pottery, ovens, and housing in Brazilian quilombos start across the Atlantic in West Africa. Veering North on the transatlantic slave trade takes us to Pottersville, South Carolina, where David Drake, among others, used pottery as resistance in enslaved communities throughout the 18th and 19th centuries.

Source: 9. volume and direction of the Trans-Atlantic Slave Trade. Slave Voyages. (n.d.). https://www.slavevoyages.org/blog/volume-and-direction-trans-atlantic-slave-trade

Similar to archeological evidence of ethnogenesis among pottery production in the Macacu Valley north of Rio de Janeiro, Brazil, expressions of African-American christianity in Low Country, South Carolina have been tied to Atlantic Africa and the larger African Diaspora, including the Bakongo religion of the Basimbi people of West Central Africa, West African cultures in the present day Liberia, Sierra Leone, Guinea, and Senegambia region, the South Atlantic Coast of the United States, and even parts of the Indian Ocean (Ferguson & Goldberg, 2019). Folk-made pottery in Low Country, South Carolina, used for preparing food, holding sacred charms, and administering folk-medicines serve as a physical representation of these influences on early African-American christianity. These vessels, known as colonoware due to their production for colonial environments, do not have specific racial or religious ties, but rather link locations with activities and identities. Their archeological distribution maps rice and cotton plantations in the region from the late 1600s up to almost 1900, and as production progressed through time, the bowls shifted from a stronger Indigenous influence to more typical European pottery styles.

There is limited oral history surrounding these vessels; rather, the clay itself holds history and heritage of enslaved and Indigenous people in Low Country, South Carolina. Resistance is found in simple markings and carved initials hidden in the vessels, among which the Bakongo Dikena marking is seen central to many bowls, interpreted as a religious and spiritual marking on the vessel. There is a distinct difference in the mapping of colonoware and spiritual vessels; while most colonoware was found on land, the majority of vessels with the Dikena marking were found underwater, linking these markings to common West African and Bakongo spirituality: "The watery location of most of these small number of cross-and-circle marked vessels is consistent with the Bakongo notion of any body of water as a directavenue to the spirit world as well as the use of ceramic vessels as containers for [spiritual charms]" (Ferguson & Goldberg, 2019). From this tracing, we see how clay moves beyond physicality in both its production and design to a material that encapsulates spirituality, culture, and shared identity as resistance to colonial occupation.

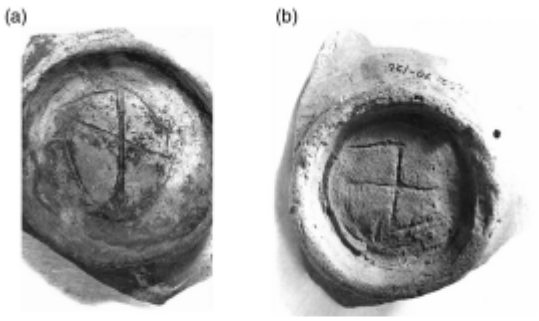


Figure 3. Colonoware bowl bases with marks similar to the Bakongo cosmogram, from Pimlico Plantation (underwater) (left), and Mepkin Plantation (underwater) (right). Marks range in size from one to two inches. Photographs by Emily Short.

Source: Ferguson, L., & Goldberg, K. (2019). From the earth: Spirituality, medicine vessels, and consecrated bowls as responses to slavery in the south carolina lowcountry. Journal of African Diaspora Archaeology and Heritage, 8(3), 173–201. https://doi.org/10.1080/21619441.2019.1690843

Traveling Northwest to Old Edgefield, South Carolina, we are met with histories of enslaved laborers on cotton, sugar, rice, and indigo plantations, as well as enslaved industrial labor within the region. Often referred to as Pottersville due to its many stoneware factories, pottery from this region offers insight into

culture from traditional West African pottery, such as nkisi clay figures, and resistance through ownership and literacy carved into the ceramics. David Drake, an enslaved potter and poet in Old Edgefield, created thousands of large pots and storage jars throughout his life, many signed with his name or poetry. These jars embody his resistance through writing not just in the messages of culture and ownership, but in their very existence. On many pieces of pottery, Drake signed his name under his owner's, a simple act of resistance claiming the jars as his own. On others, he wrote lines of poetry, including "Dave belongs to Mr. Miles/ wher the oven bakes & the pot biles" on a pot inscribed with the date, 31 July 1840, and "I wonder where is all my relations/ Friendship to all—and every nation" on a pot inscribed 16 August 1857 (Cross, 2024). Contemporary Black artist Phoenix Savage summarizes the resistance of Dave's work, stating "Based upon the rules of the system of slavery, at no point should we have ever known of Dave the Potter. Yet we do ...We know him. He made sure of that." (David Drake's poetic pottery was resistance, n.d.). From West African spirituality to Brazilian Quilombo heritage to literacy of enslaved people in South Carolina, the materiality of clay is used as a link to the natural world and political and social structures within communities and as a messenger of decolonization through their heritage, identity, and resistance.



David Drake's Storage Jar.
Source: Rizzo, A. (2023, January 10). Examining storage jars from the American South. The Metropolitan Museum of Art. https://www.metmuseum.org/perspectives/edgefield-food-storage

Currently, however, modern extraction of clay threatens this material resistance, as open pit mining, pipelines, and other forms of extraction destroy land and colonize territory. Since 2006, a kaolin clay pipeline through Quilombo land in Moju, Para, Brazil, threatens the livelihoods of 674 Quilombola families living in the region. Over 20% of the Quilombo territory has been lost due to blocked access roads, installation of the pipeline and transmission lines, and destruction from mining trucks and production (*Kaolin pipeline on Quilombo land in Moju, Para, Brazil*, 2022). Similar territory loss is seen in the Amazon, where the destruction of clay licks threatens biodiversity through deforestation, slash and burn agriculture, and soil degradation (Clay Licks, 2022). Even with this loss of territory and natural land, kaolin mining and production in the Amazon is growing, and industrial growth is being prioritized over sustainability and limited extraction (Klein & Lundblad, 2024). Calcined clay is a growing industry in

Brazil, with six plants in São Paulo and Minas Gerais, developed since 2001, supplying over 50% of the cement for new development projects (Parashar et al., 2024). As urbanization continues to expand, so too will moments of destruction, territory loss, and cultural and mineral extraction. Looking at historic modern resistance against this form of extraction and colonization through clay and pottery offers a hopeful outlook centered around material resilience, purposeful design, imaginaries of decolonization.



Map of Kaolin Pipeline in Northern Brazil.
Source: Kaolin pipeline on Quilombo land in Moju, Para, Brazil. EJ Atlas. (2022). https://ejatlas.org/conflict/kaolin-pipeline-on-quilombo-land-in-moju-para-brazil

Clay as Climate Justice, Decolonization, and Resilience

Clay and larger patterns of mineral extraction offer many leverage points for integration of the six pillars of climate justice (*What is climate justice?,* 2022). Clay-based infrastructure that reduces greenhouse gas emissions as well as explorations into uses of clay for carbon sequestration and energy and battery storage are notably related to a just transition and natural climate solutions. However, at current rates of extraction tied to harmful open pit mining, territory loss, and pipelines, it is currently threatening social, racial, and environmental justice, Indigenous climate action, and community resilience and adaptation. It is imperative to bring clay back to its roots as a sharer of culture and a storyteller of resistance. Through localization and connection with the climate, clay offers an opportunity to excel in all pillars of climate justice, examining the climate crisis as a crisis of colonization and exploitative extraction, from which racial, social, and environmental injustices stem. Within this framework, cultural resistance highlights community resilience as an imaginary of decolonization.

New York City's Whitney Museum of American Art tells a story of Alvin Ailey's ambition as beyond the typical realm of a dancer or choreographer. Inspired by his childhood during the Great Depression in 1930s Texas, "[he] wanted to paint… [He] wanted to sculpt. [He] wrote poetry. [He] wanted to write the great American novel" (*Edges of Ailey,* 2024-25). The exhibit, featuring works of Ailey among painters, sculptures, poets, filmmakers, and others spanning West Africa, the Caribbean, Brazil, the American South,

and ultimately ending in New York, traces Black artistry, heritage, and resilience from the Transatlantic slave trade to imaginaries of afrofuturism.
Ailey's work is mirrored in the formation of clay, providing material in which heritage is preserved in the art of carving images in negative space (*Edges of Ailey,* 2024-25). Ailey positioned himself within clay formation of the Americas, saying "I'm a Black man whose roots are in the sun and the dirt of the South," a location he described as inseparable from West African and South American histories. His works often depicted a motif of water, representing rivers and oceans that signify the Middle Passage of Enslavement and the "violent extraction of Black people from West African Countries to the Americas" (*Edges of Ailey,* 2024-25). It is here that our tracing of clay ends, seeped in the wetness of the earth and the natural movement of extraction.

In *Edges of Ailey*, Artist Maren Hassinger's mixed media installation, *River*, brings into play the viewer's notions of materiality, challenging the viewer to perceive the materiality of resistance by provoking thought surrounding the invention and existence of steel chains. This exhibit begs the question of the need for a stronger rope associated with American and European enslavement, evoking histories of resistance, as expressed by Melvin Edwards' *Lynch Fragments*: "There are some elements like chains, [and] people love to jump to slavery and oppression – that can be, but nobody remembers why chains were invented… I know that that's the human invention of a stronger kind of rope. Everything else is implication" (*Edges of Ailey,* 2024-25). As does the preservation of heritage as resistance in clay, the materiality of steel tells a story of resistance, resilience, and decolonization.

Luis Francia writes of pottery as poetry in his 2019 poem, "Clay," writing "Throw the word on the poet's wheel, / Write the mud on the potter's desk." He quotes British potter and writer Edmund de Waal's "Words turn into pots and pots turn into words," showing, similarly to David Drake, that there is poetry in the resistance of clay (Francia, 2019). In this poem, themes of clay as a vessel for art and livelihoods expand on Quilombola, Black feminist, and decolonial ideas of clay as a way of life, offering a path forward that appreciates clay for its power as a storyteller rather than for its extractive value.

Brazilian artist Thiago Saraiva's recent participation in the 2019 exhibit *Remembering to Not Forget: Art as Resistance in Rio* at the Museo Nacional in Rio de Janeiro focused on the collective memory of shared spaces. A chalkboard reading "I listen to forgotten stories," beside which he invited the audience to share a ceramic cup of simple orange tea prepared traditionally by way of his ancestors. The tea, and by proxy, clay of the ceramic cup, is a "connecting thread from present to past." (Parvenski, 2019). In this practice, the clay shares ancestral history that exists outside of spatial and temporal frameworks, offering a vessel of connection resilience in the face of loss.

Even in these stories of decolonial resistance, exhibited in *Edges of Ailey* at the Whitney, *Hear me Now* at the Metropolitan Museum of Art, and galleries, poetry, and other forms of recognition across the world, physical pieces of pottery, as well as Afro-Brazilian heritage, Indigenous culture, and afrofuturism, are extracted for the benefit of globalization and urbanism. The permanence of Alvin Ailey's theoretical and spatial works are held in opposition to the temporal nature of the physicality of space, in which clay and pottery must be extracted from their origins to be seen. To view this materiality as resistance is to question extraction and colonization across urban and nonurban landscapes. To acknowledge that resources aren't limitless and to localize and reconnect with clay as a link to climate and as a way of life is to understand the materiality of design, resistance, and decolonization as a challenge to colonial systems of exploitation and extraction.

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