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CLCWeb: Comparative Literature and Culture

ISSN 1481-4374

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Volume 24 | (2022) Issue 1 Article 17

Incendiary Devices: Imagining E-Waste Frontiers and Africa's Digital Futures

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Recommended Citation

De Loughry, Treasa. "Incendiary Devices: Imagining E-Waste Frontiers and Africa's Digital Futures." *CLCWeb: Comparative Literature and Culture* 24.1 (2022): <https://doi.org/10.7771/1481-4374.4297>

This text has been double-blind peer reviewed by 2+1 experts in the field.

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CLCWeb: Comparative Literature and Culture

ISSN 1481-4374 <http://docs.lib.purdue.edu/clcweb>
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Volume 24 Issue 1 (March 2022) Article 17
Treasa De Loughry,
"Incendiary Devices: Imagining E-Waste Frontiers and Africa's Digital Futures"
<http://docs.lib.purdue.edu/clcweb/vol24/iss1/17>

Contents of ***CLCWeb: Comparative Literature and Culture* 24.1 (2022)**
Special Issue: ***Periodizing the Present: The 2020s, The* Longue Durée*, and Contemporary Culture*. Ed. Treasa De Loughry and Brittany Murray**
<http://docs.lib.purdue.edu/clcweb/vol24/iss1/>

Abstract: In her article, "Incendiary Devices: Imagining E-Waste Frontiers and Africa's Digital Futures," Treasa De Loughry focuses on different visual responses to e-waste in West Africa, from eco-documentary film and photography responses to the infamous Agbogbloshie e-waste yard in Ghana; to techno-utopian visions of e-waste bricoleurs, and e-waste as a signifier and artefact of the neocolonial nature of the capitalist world-ecology. The first half of this article focuses on Florian Weigensamer and Christian Krönes' documentary film, *Welcome to Sodom* (2018), grounding it in critiques of the transmedial influence of the documentary form, while attending to the film's pyrotechnical "optical regime" (Schoonover). The second half of the article moves from the archaic and exceptionalizing nature of Weigensamer and Krönes' work to a consideration of futurist digital narratives of "rising Africa," among them the periodic re-emergence of the post-SAP era (e-waste) bricoleur, contrasted with Francois Knoetze's experimental visual art films *Core Dump* (2018-2019), and its richly historicized approach to the *longue durée* of African resource extraction. High-tech waste, as demonstrated by these examples, is a resource opportunity and toxic hazard, a result of rapid obsolescence, and a signifier of future resource depletion. It requires consideration not just of its "techno-fossil" materiality, but how it draws on key aspects of the transformation of the world-ecology, among them the neoliberal intensification of precarious labor, the expansion of specialized peripheral mega-dumps, and the recursive nature of waste's value in an era of ecological scarcity. It is within this broader framework that this article seeks to place and interrogate contemporary e-waste depictions.

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Treasa DE LOUGHRY

Incendiary Devices: Imagining E-Waste Frontiers and Africa's Digital Futures

Introduction

Agbogbloshie, the site of an infamous e-waste dump in Accra's Old Fadama district in Accra, Ghana, is regularly described as the "largest e-waste dump in the world," becoming, in critical waste scholarship, a paradigmatic space for examining visual responses to global waste trafficking; specifically popular media representations that depict Agbogbloshie as an exemplar of our current and future apocalyptic digital waste-scapes.[1] Agbogbloshie acquired this troubled reputation due to the work of the Basel Action Network and Greenpeace on global e-waste trafficking, and a related uptick from 2008 in investigative reports that ensured its reputation as the world's "electronics graveyard" (see Akese 8). These findings have since been contested by journalists and social scientists, who note that the figures used to describe Agbogbloshie as the largest e-waste dump in the world are based on one statistic, which "can be traced back to a report by NGO 'the Basel Action Network' which comes from a conversation with a single individual in Lagos who offered it as an off-the-cuff estimate" (Burrell).[2]

However, Agbogbloshie still looms large in contemporary waste scholarship and imaginaries. The subject of multiple documentaries and photography series, it is portrayed as a tragic indictment of rubbish imperialism, or the dumping of e-waste from Northern core regions to the "Global South," despite its small size in comparison to other e-waste sites, like that in Guiyu, China; and its prosaic reality as a site for metal recovery and everyday repair work, servicing the broken appliances of Accra's growing middle class. This includes Florian Weigensamer and Christian Krönes' 2018 documentary film, *Welcome to Sodom*,[3] which uses landscape shots to capture an apocalyptic vista: of a seemingly unending rubbish dump wreathed in smoke, amidst which animals graze on plastics, as a preacher condemns sinning workers to hell, and voiceovers flesh out the film with tales of personal despair and urban legends about the monster-inhabited Korle lagoon. Further, Agbogbloshie's cultural influence extends to Hollywood: the art team of *Blade Runner 2049* (2017) describe being inspired by the planet's landfill "peripheries" while creating the film's waste-scapes. In interview, art director Paul Inglis details how the team personified the salvage work of Agbogbloshie in the form of an "orphan production line where each tiny child body is repurposed as a mining machine, scraping decaying circuit boards for anything of value" (qtd. in Young 132).

These diverse visual representations—from apocalyptic documentary realism to speculative post-apocalyptic futures—take their cue from extensive post-2000s photographic work focused on Agbogbloshie, like Peter Essick's accompanying images for Chris Carroll's 2008 *National Geographic* article, Pieter Hugo's 2011 photography book *Permanent Error,* and Kevin McElvaney's 2014 series. These mediations work by emphasizing the shocking environmental impact of throwaway culture in highly racialized terms. Such ruined landscapes are presented as the unfortunate consequence of modernity, the offshored "dark ecologies" (Morton 2016) of Global Northern "progress"—or a centrifugal logic by which waste, its landscapes, and those who sort it, are presented as being pushed away from the "center" or core of modernity, both geographically and imaginatively. Capitalism's vying temporalities are contained within this contradiction, as these texts query the gap between digital modernity's dependence on archaic manual labor, aligned problematically with Africa, and the conveniences of these technologies, which are utilized initially elsewhere.

Rather than repeating these dominant approaches towards e-waste (as an environmental scourge that victimizes passive Southern waste workers), this article seeks to redeploy contemporary insights from the environmental humanities to ponder what happens if we treat digital waste as a resource, as a site of potential capital "value" and reuse in an era of diminished raw materials, rather than simply as inert trash and a symbol of Western excess. Indeed if there is a "world-extraction-system, with a 'travelling' set of thematic *and* aesthetic attributes" (Macdonald 300), then we should query the cultural

[1] See recent standalone chapters in Armiero 2020, Iheka 2021, and Little 2021.

[2] To put it into context, the amount of electronic equipment and waste being imported into Ghana annually is estimated at 215,000 tons, most of which is repairable, in contrast to the estimated 44.7 million metric tons of e-waste generated globally in 2015 (see Lepawsky, chapter 4; Minter 251). This is not to condone the toxicity of manual disassembly work, which involves burning plastic wire casings and leaching metals in acid baths, with scientific research on Agbogbloshie confirming the toxic seep of heavy metals into worker bodies and the surrounding landscape. Nor is it to diminish the effects of obsolescence, and the increase in waste globally. Rather it is to counter simplistic narratives that treat Agbogbloshie as an exemplar of "slow violence" (Nixon 2011).

[3] Agbogbloshie is known locally as "Sodom and Gomorrah."

and theoretical amnesia of documentary treatments of waste-scapes like Agbogbloshie as sites of terminal loss, of the abrupt endpoint of capital accumulation and "wasted" objects and lives, thus reducing these places importance as emerging resource frontiers fueling modernity's digital infrastructures.

Importantly, documentary treatments of waste-scapes and workers as victims of global consumption have political-ecological consequences. Marxist sociological research by academics like Melanie Samson and Julia Corwin examines how media representations of waste and informal scavenging labor as failures of postcolonial civic life can be utilized as justifications by corporations to "enclose" the last remaining waste commons, in the midst of wider resource grabs. This is not to disavow the dangerous toxic reality of disassembly work, which fuels, as Little argues, a booming "global metal scrap economy and fast-growing informal e-waste trade sector" (xiii), that disproportionately impacts precarious workers in the Global South.[4] The reality is that life in the planet's scrap-yard peripheries is as extractive, but more contested and complex, than documentary visual works imagine them to be.

To push this still further, if we read "ruined" digital waste-scapes with an eco-materialist lens, then the presence of waste workers who scavenge sites like Agbogbloshie for precious metals and reusable parts are not symptoms of neoliberalism's terminal failure, but of capitalism's adaptative capacity to circumvent the challenges of a resource-exhausted world. We know that waste, in general, is not the depletion of value: as Michael Thompson states, discards become "rubbish" when our waste regimes remove them from circulation and when social conditions reframe them as "obsolete." Historically, waste work has always been an important corollary to industrialization, with salvage workers and dumpster divers recovering the potential value of used objects (Strasser). However, from the 1970s onwards, as the US and Europe experienced waste crises—as landfills overflowed and new environmental policies sought to make the "polluter pay"—waste trafficking from core to peripheral regions increased in intensity and hazard, leading to the infamous Larry Summers 1990 World Bank memo, and the "slow violence" (Nixon) by which multinational corporations sought to exploit local environmental loopholes to ensure cheaper dumping and processing costs.

While this narrative has dominated environmental-justice scholarship, the contemporary reality has shifted, particularly regarding "high value" waste items.[5] Most e-waste recycling migrates locally, and materials recovery, for steel, copper, aluminum, silver, palladium, plastics, glass, and others, is for regional markets, with Global South-South trade the norm amongst e-waste sites and brokers (Davis et al.). But placing the intensification of this work in its environmental context, the dismantling of high-tech objects, alongside metal-recovery work, are signs of the collapse of "cheap" nature, or easily available raw materials (Moore), confirming the longevity and urgency of waste as a resource. Now more than ever, sites of high-tech disassembly are places for the recursive capture of value; or "urban mines" (Corwin 4-5), from which global networks of extraction and trade can be mapped (Little 12). In multiple ways, political, ecological, and social, Agbogbloshie is paradigmatic rather than exemplary of the near-future waste-scapes of the world-ecology: globally, there are many Agbogbloshies.

Peripheral zones are thus sites for ongoing, complex, and global negotiations of waste narratives, and for new modes of extraction, pollution, and enclosure. But e-waste's emergence as a resource is not only a sociological phenomenon, but one deserving of critical cultural analysis in light of recent work in the environmental humanities. Taking a cue from Macdonald's work on petro-fictions, if there is a "travelling" set of aesthetic and symbolic responses to high-tech waste as a resource, these responses need to be put into dialogue with the contested socio-ecological contexts from which they emerge. In contradistinction to energy sources like oil that are rapidly moved away from the site of extraction, and require highly trained workers and complex machinery, e-waste recovery is local, manual, and improvisational, depending on regional networks of sorters, metal workers, brokers, and self-taught engineers; but given its origin in digital "mines," e-waste attracts protean imaginative responses. It has a redolent symbolic quality that can be used to great effect, as we will see below in Francois Knoetze's work, in signifying the sharp energetic and infrastructural exclusions of modernity.

[4] See Little for an overview of the role that "racial capitalism" plays in toxic dumping (1-35); or the interlinking of environmental justice, black lives, and ecology. See also Bullard's earlier and extensive work on racism and pollution in the US, *Dumping In Dixie* (1990).

[5] This reading aligns with Gidwani's fifth thesis, that waste is "an excess or exudation that is prior to and product of capitalist accumulation that capital try as it might, can never fully capture and which therefore is an ever-present threat to it" (779), due to the threat posed to the environment by toxicity, and the incomplete nature of metal recovery; while also operating as "an untapped potential for capital: a boundary object; value-in-the-making; and a historical, technical, and political artifact."

In summary, this article focuses on the interaction between different visual responses to African e-waste landscapes, and how they consolidate or challenge neo-colonial approaches to waste as a resource. It starts by analyzing Weigensamer and Krönes' *Welcome to Sodom* as an example of an eco-documentary film that responds from "without" Agbogbloshie and confirms naturalized and archaic responses to supposed "African mismanagement." The second half of the article moves from the exceptionalizing nature of Weigensamer and Krönes' work, as part of a pyrotechnical "optical regime" (Schoonover), to a consideration of futurist digital narratives of "rising Africa," among them the periodic re-emergence of the post-SAP era (e-waste) bricoleur. This is contrasted with Francois Knoetze's experimental visual art film *Core Dump* (2018-2019), and its richly historicized approach to the *longue durée* of extraction in Africa, anti-colonial liberatory thought, and contemporary neocolonial anxieties about the enclosure of digital space.

Ato Quayson describes how "the social world itself is the product of referential relays that are encapsulated in discursive ensembles in which different fragments 'speak' to each other across a nexus of knowledge, ideology, and power" (213), producing an interdisciplinary and discursive way of reading that is crucial, Quayson argues, to the study of African literature. Extending this point still further, considering the interaction between different cultural and discursive modes (documentary film and photography, Hollywood films, literary sources, global media reports), is especially important in relation to peripheral sites in the Global South that have become significant for transnational extractive flows. High-tech waste is a resource opportunity and toxic hazard, a result of rapid obsolescence, and a signifier of future resource depletion. It requires consideration not just of its "techno-fossil" materiality, but how it signifies the transformation of the world-ecology, including the neoliberal intensification of precarious labor, the expansion of specialized peripheral mega-dumps, and the recursive nature of waste's value in an era of ecological scarcity. It is within this broader framework that this article seeks to place and interrogate contemporary e-waste depictions.

Pyrotechnic Narration: Agbogbloshie and the Art of Waste

Agbogbloshie, more than any another digital recycling landfill, or place of disassembly work, has become an important site for the creation and remaking of transmedial narratives about the hazards of waste work and the dumping of toxic rubbish onto global peripheries. These narratives circulate beyond the dump: in West Africa, international condemnation regarding Agbogbloshie led to more stringent interpretations of waste-trafficking rules, including the imprisonment of a Nigerian rubbish trader; and the launch of an Interpol action against waste trafficking called "Project Eden" (Lepawsky, chapter 1). There are obvious ironies here regarding how biblical metaphors of Eden and Sodom, which were used to justify European colonial expansion, including the "Scramble for Africa," are redeployed to refract Global Northern responses to Africa as a site of environmental mismanagement, while serving the additional (and perhaps unintended) benefit of securing waste metals for the few.

The popularity of Agbogbloshie's representation as toxic landscape—which is depicted contrarily as evocative of archaic forms of labor, and the future of a wasted Anthropocene—is best encapsulated by Weigensamer and Krönes' *Welcome to Sodom* (2018, an Austrian production, shown extensively at global documentary film festivals). Set in Agbogbloshie, *Sodom* is notable for how it arranges its visual and narrative material. It begins with panning shots that portray the site as a vast, flat landscape, in a play on perspective that encompasses and flattens wandering animals, waste workers, and vast mounds of discards. Artfully arranged CT monitors and tires give a sense of the vastness of the problem; and extremely underexposed images dramatize the toxicity of waste work in hellish terms.

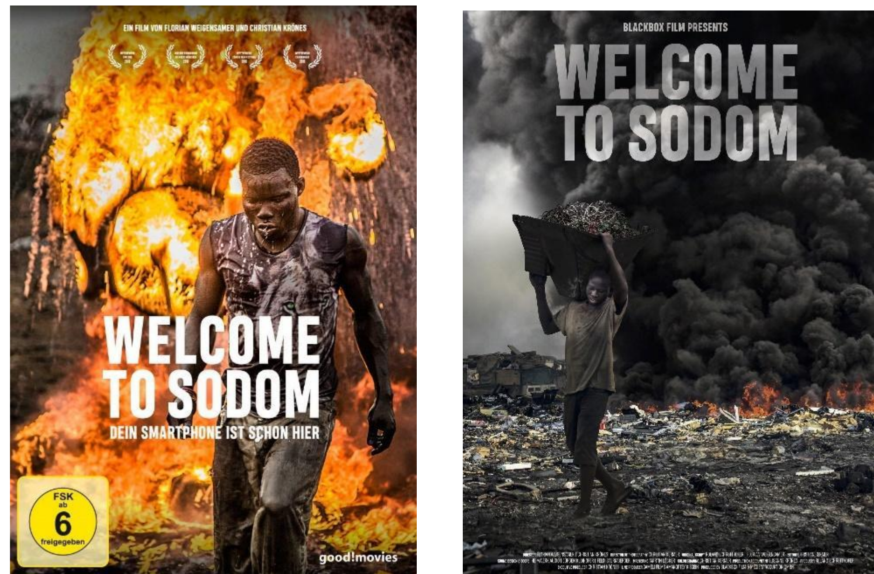

Figure 1: Promotional posters for *Welcome to Sodom*.

Promotional posters for the film create heightened drama by foregrounding young male workers in dramatic pyrotechnic shots (Fig. 1): walking away from bonfires of burning computers, or thrusting fireballs of tires into the air, in a clear reference to the site's hellish eponym. Adam Minter, a journalist who has written extensively on global waste trafficking, visited the yard and describes how Agbogbloshie workers are well-used to photographers' desires to capture dramatic images of e-waste destruction. Local worker Awal Mohamed states that "If a photographer tips him properly, he'll add a bit of extra fuel to the fire to make it more photogenic, put his safety at risk and wave a burning tire over his head, or, at a minimum, ensure his crew of burners is available" (256): techniques which, as Minter notes, were put to good use for a 2017 music video shot at Agbogbloshie for the UK rock band Placebo. The artifice of Agbogbloshie's incendiary images is designed to confirm Euro-American suspicions about the pyrotechnic hazards and mismanagement of West African landfill sites; thus confirming Agbogbloshie's emergence as a sacrifice zone. Notably, the incendiary and almost "toxic sublime" quality of these scenes has achieved the status of a shorthand transmedial aesthetic, finding its way into literary fiction, like Kwei Quartey's *Children of the Street* (2011), in which protagonist Detective Darko vividly describes the environmental horrors of burning plastic, which creates "dense black smoke all along the banks of the Odaw. The boys burned TV and computer cables to get at the copper wires, which they sold locally for fifty pesewas per kilo, or about eighteen cents per pound" (9).

However, in reading the incendiary aesthetics of *Welcome to Sodom*, the tension here is not simply between the artifice of documentary films and their claims to "realism," a well-worn assertion about which much has been written (see Lepawsky for a useful summary, chapter 5). Rather, the irreal theatricality of *Sodom* severs the site and its inhabitants from modernity, and curiously naturalizes the very conditions that produced the e-waste site in the first place. Although we are repeatedly told that e-waste is produced by wasting activities *elsewhere*, specifically in the Global North, the site is presented as almost hermetically removed from its surrounding urban infrastructure, and from any reference to the global city networks that smooth waste traffic to West Africa. The pyrotechnical imagery of the documentary aestheticizes the almost gothic terror of waste recovery, presenting it as a uniquely toxic and almost site-specific process.

Eco-documentaries are designed to educate, persuade, and shock by unveiling a buried or under-regarded environmental hazard, and *Welcome to Sodom*, in its "unveiling" of a global trash mountain shifted to peripheral countries, is part of a wider trend of documentaries and short films solely focused on Agbogbloshie, like PBS's *Ghana: Digital Dumping Ground* (Peter Klein, 2009), *E-Waste Hell* (SBS Australia 2011), *E-Wasteland* (David Fedele, 2012), *Terra Blight* (Isaac Brown, 2012), *The E-Waste Tragedy* (Cosima Dannoritzer, 2014), *Regolith* (Sam Goldwater, 2014), *ToxiCity* (RT 2016), *Kofi and*

Lartey (Sasha Rainbow, 2019); or global trash documentaries, like *The 11th Hour* (Conners and Conners, 2007), *Trashed* (Brady, 2012), and *Anthropocene: The Human Epoch* (Baichwal, Burtynsky, de Pencier, 2018). For Schoonover, documentaries foreground subject matter that requires the objective "defamiliarization" of documentary's "modernist-realist" mode.[6] Trash is ripe for re-foregrounding, given that modern waste management's removal of garbage from sight and mind is an obscuring "optical regime" (Schoonover), with roots in modern urban planning and environmental mis-management—incidentally, these are disciplines with fraught histories in the context of former colonial West Africa, where early theories about tropical medicine, hygiene, and city planning were trialed (see Newell).

Writing on Fred Lonidier's photography series *The Health and Safety Game* (1976) about the occupational hazards of manual workers, Allan Sekula notes the difficulty in "socially conscious art, of being overcome by the very oppressive forms and conditions one is critiquing, of being devoured by the enormous machinery of material and symbolic objectification" (876). Lonidier was a union activist and artist, and thus highly conscious of the potential for exploiting worker suffering for personal and professional gain.[7] Likewise, Sekula's own work focuses on the "forgotten" workers and spaces of modernity, but aims to ensure a degree of "typicality" (877) rather than exceptionalism to suggest a shared narrative of global worker exploitation under the guise of capital accumulation; and by extension to generate transnational viewer empathy and solidarity. However, eco-documentaries, particularly those made for and by a Global Northern audience, and those that depict precarious informal workers—surely some of the most vulnerable workers on the planet—must thread a more transparent and careful path in justifying depictions of dismantling labor as dire and accursed, since they risk exoticizing difficult labor conditions as a kind of "ruin porn" (see Mah 2014).

To return to *Welcome to Sodom*, its major documentary reveal is to foreground the offshoring of e-waste from the Global North to the Global South. It does this by way of voiceovers, and of supplementary captions to describe how "Agbogbloshie, Accra is proven to be one of most poisonous places. It is the largest electronic waste dump in the world," with waste "Shipped to Ghana illegally" "from the UK, USA, Canada and countless other rich and developed countries." The documentary's participants are presented *in situ*, either facing the camera or participating in waste work and leisure activities, with their narration pre-recorded and played over the scene, suggesting the artful curation and management of eyewitness testimonies (it is unclear whether the voiceovers are done by actors or the workers themselves). The disaggregation of voiceovers from interviews leads to the documentary relying heavily on the distancing gaze of the camera to create the impression of objectivity and passive witnessing. At no point are the documentary makers filmed engaging with local workers, further distancing their curation and involvement in setting up scenes, which veer between close-ups of toxic and time-consuming metal-recovery work, from burning plastic casing off wires, to using magnets to collect buried wires; to intimate and playful scenes of young male workers dancing, recording music, and flirting. An entire world of work and affection is contained within these scenes; but it is one that is recorded at a distance, presenting Agbogbloshie as an almost hermetically sealed space, in which protagonists keen to emigrate to the US, or to escape gender- and sexual-based violence, are confined by the literal and invisible walls of their own poverty.

Literary critics have long observed that environmental narratives about Africa naturalize the landscape, drawing from a well of colonialist discourses about empty "virgin" lands, with late twentieth-century cultural forms often focusing on conservation efforts that over-emphasize "charismatic" creatures, rather than the *longue durée* human-nature interaction and dispossession structuring the development of, and access to, nature (see Caminero-Santangelo; Iheka 2018). *Sodom*'s presentation of the e-waste yard as a peri-rural landscape (leaving out the vibrant food and repair markets surrounding the yard), as a victim to global waste flows about which we are always "told" but never "shown," suggests that it is drawing from a similar well of African eco-narratives and documentaries, which emphasize a purportedly disinterested public-interest story in a peculiarly isolated fashion. In this way, the documentary fails Sekula's injunctions, with the form being devoured by the objectification it projects onto its protagonists, while placing their stories within an exceptionalizing narrative frame. Querying the eco-documentary's commitment to realism, Schoonover asks whether "the realist imperative to photographically reveal the world do more to obscure than to document humanity's most menacing waste?" While Schoonover focuses on forms of invisible toxic waste that require highly mediated graphic images and scientific expertise, this article is interested in materialist erasure, or how

[6] Although at work even here are assumptions about the primacy of the visual gaze, and documentary as a "positivist" (Sekula 862) mode that promises *apriori* access to an unmediated gaze, and thus the "truth."
[7] See Cajetan Iheka's critique of how the subjects of Pieter Hugo's series on Agbogbloshie do not receive a fee reflective of the value that his portraits achieve in the art market (2021, 65).

waste narratives tap into short-hand tropes—like Afro-pessimism—that, through political narrowing and historical shortening, turbo-charge the shock quality of eco-documentaries like *Welcome to Sodom*.

This extends not just to representations of landscapes, but also to workers. Michelle Yates, responding to the metaphorical description of populations like migrants and refugees as "wasted" "wasteful," and "rubbished," which gained theoretical traction in Zygmunt Bauman's 2003 book on "wasted lives," cautions that the processes by which people are rendered "wasted" is historically and structurally specific. Ghana achieved independence in 1960; successive military coups, economic mismanagement, and an over-reliance on mono-crops led to years of debt and forced structural adjustment through currency deregulation, privatization, and a collapse in subsistence economies. Significantly, the phrase "informal sector" was coined by anthropologist Keith Hart in the 1970s while he studied rural to urban migration in Accra (migration from the North of Ghana to the South was a key catalyst for the growth of Agbogbloshie), and observed growing shanty towns and the development of piecemeal modes of self-employment and informal work. Ever since, the phrase "informal economy" has been attached to the growth of under-employment in peripheries effected by urbanization and flexible accumulation. "Informality," however, can be used to collapse gradations in precarious labor, and suggests a "wasted population" that is "outside" capitalism, to which workers are loosely affiliated. Contemporary waste workers see their work as highly skilled and specialized (Corwin 16), with e-waste workers crucial to the repair and maintenance of digital infrastructures. The gritty and pain-staking work of metals recovery, disassembly, and reuse, which might appear archaic or anachronistic in eco-documentaries, is driven by an intensified demand in global manufacturing in the context of diminishing raw materials that result in a need for new modes of "commodity deepening" and "widening" (Knapp). E-waste workers then are an important node in emerging extractive frontiers, but are largely invisible in technocratic discussions about digital futures and reuse. This is a historically and ecologically specific outcome of late-capitalist accumulation, one that risks elision by abstract and reifying imaginative and theoretical gestures to "wasted lives" and "wasted landscapes."

Portal Guns to the Future: E-waste, Bricoleurs, and Africa's Digital Futures[8]

I want now to shift to another popular depiction of Agbogbloshie and e-waste in Africa—that which links digital rubbish to high-tech futures. A mass depiction of e-waste workers is as ingenious bricoleurs who can overcome asymmetrical access to digital infrastructures and hardware through DIY skills and entrepreneurialism. This representation of the bricoleur is not a new phenomenon. Popular North American science-fiction films and novels often feature plucky self-taught engineers, whose willingness to improvise rapid solutions to cascading mechanical errors offers a neat way to build narrative suspense. In the African context, however, this emphasis on the indigenous knowledge and adaptive capacity of the e-waste "bricoleur," as a way of helping the continent leapfrog into the fourth digital revolution, is closely bound-up with an economics of austerity and the material politics of digital enclosure. This includes the advent of Makerlabs, or makerspaces, which are part of a well-developed trend of "labs" in Africa, funded by NGOs, US universities, and corporate philanthropic support, that, since the early 2000s, have sought to harness local e-recycling knowledge by formalizing innovation. However, maker labs, as Ginger Nolan has argued, risk activating colonial-type tropes of African art and scientific knowledge as craft, or rudimentary indigenous responses to materiality through repair workers, or bricoleurs. E-waste becomes e-technology-in-waiting—its latent value realized by a network of precarious workers, whose repair labor and entrepreneurialism can be formalized and upgraded by interfacing with the correct Euro-American labs.

To turn to one relevant example, the Agbogbloshie Makerspace Platform, or AMP, established by US- and France-based architects DK Osseo-Asare and Yasmine Abbas, aims to overcome class inequalities by harnessing the knowledge of local informal repair workers and science graduates, or what project co-lead Osseo Asare calls the "Sankofa innovation" (*TED*) of "Afronauts."[9] This includes their efforts, in 2018, to make a spacecraft. Their creation joined "an emerging fleet" including one "space craft" launched in Dakar, whose construction playfully gestures to narratives of African technological prowess.

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[8] This phrase, "portal guns," is taken from the website for the research group *Digital Earth*: "The computer in the palm of our hands is a 'portal gun' — an entry point to a planetary structure linking lithium mines in Chile to offshore data servers in Russia, to fibre optic submarine cables in the Atlantic to freeports in Singapore, to corporate-owned satellites in orbit, to a swelling quantity of IP addresses and teraflops of data. Old cultural, economic and political structures and connections are being reshaped by digital technologies into new, uncanny geographies — and all the while we already inhabit them" ("Vertical Atlas").

[9] The Sankofa bird is famously depicted with its head twisted backwards, and is associated with the Akan proverb "*se wo were fi na wosan kofa a yenki*": "it is not taboo to go back and fetch what you forgot" ("Sankofa").

The emphasis here is on the *craft* aspect of "spacecrafting" by *"knowing how to craft what you want out of your space (environment)"* (AMP "Spacecraft," italics in original: see Fig. 2 below). By navigating Agbogbloshie's waste-scape through scientific knowledge and a techno-utopian belief in the salvific power of digital innovation as progress, e-waste can be transformed through bricolage, or "craft work," into the technologies of Africa's promising future. It is worth noting that the end goals are different across Maker Labs—in this case, AMP's "spacecraft" was an air-pollution monitor—and the group are committed to open-source technologies and to bridging class divides. However, while projects like these lightly deploy science-fictional references, these should not be mistaken for the radical alterities, indigenous lifeworlds, and mixed temporalities of Afro-futurism.

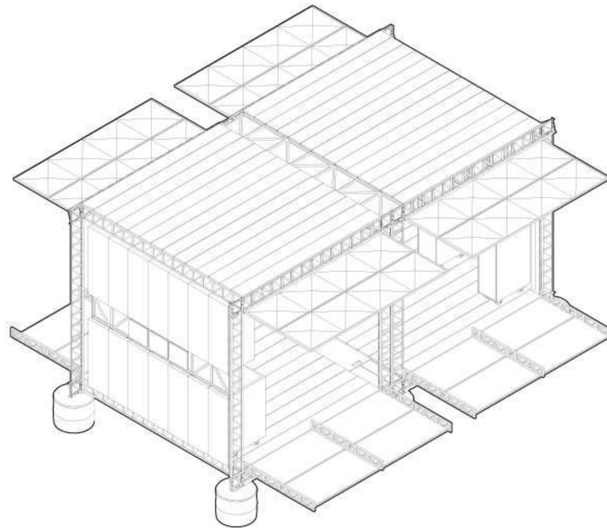

Figure 2: AMP Spacecraft

The e-waste bricoleur taps into a broader self-help narrative that promotes a meritocratic narrative of African modernity, in which high-tech recycling can overcome the *longue durée* of resource extraction, pollution, and capital flight that powered Western industrialization. As Nolan argues in her work on salvage aesthetics, the bricoleur's periodic re-emergence as a term in visual culture and business management from the 1980s onwards, is presented as a way of adapting to SAP-era cut-backs:

> The bricoleur […] can cobble together shelter and commodities from the material detritus generated by north-south inequalities. They can turn the effects of austerity measures to good because the nature of bricolage is not to turn something into something else, but to make something out of nothing. This nothing was to come not only in the form of austerity but also, […] in the form of industrial and electronic pollution—the principal ingredients for Third-World bricolage.

Furthermore, the re-emergence of the contemporary e-waste bricoleur is as much ecological as it is economic. AMP's location in Agbogbloshie is strategic: e-waste is the "urban mine" of tomorrow (Knapp),[10] and as the AMP webpage reminds us, "e-waste — considered pound-for-pound as a 'raw material' of the global production chain — is among the most valuable on the planet: one ton of old mobile phones has 100X the concentration of precious metals like gold and silver than does an equivalent amount of ore mined from the earth" ("Archibots"). Financiers have likewise identified "solid waste as an untapped resource that can be freely appropriated" (Schindler and Demaria 2). Given the context of ecological exhaustion, and the absence of new frontiers of iron, copper, or cobalt, "whose exploitation could fuel an expansionary phase of global capitalism" (2), the increased media visibility of e-waste recycling and mining technologies is part of a broader emerging landscape of "extreme extraction" techniques.

[10] But e-waste's discursive and transmedial impact is greater than its actual ecological "footprint." As Lepawsky argues, "resource extraction for, and the manufacturing of, electronics generate vastly more waste than does the postconsumption discarding of gadgets" (2018, chapter 1), as do the energy intensive data centers upon which digital technologies depend.

Returning to bricolage, Nolan traces the term's emergence in Claude Lévi-Strauss's highly problematic book *The Savage Mind*, which differentiates between "rational" engineering (or western) societies, and those that tend to bricolage and myth. The bricoleur is defined by Lévi-Strauss as a person who works with their hands, and who "undertakes odd jobs and is a Jack of all trades or a kind of professional do-it-yourself man" (17). He continues, "His universe of instruments is closed and the rules of his game are always to make do with 'whatever is at hand' […] the contingent result of all the occasions there have been to renew or enrich the stock or to maintain it with the remains of previous constructions or destructions." If, for Lévi-Strauss, bricolage bespeaks a creative attitude or disposition akin to myth making, then Nolan's grounding in visual art and architecture reveals its re-emergence in Africa as a way of justifying material scarcity in the service of a hobbled vision of postcolonial modernity. This is quite different to critical arguments for the bricoleur's imaginative potential as a mode of resistance—in relation to aesthetics the distinctions here are ones of positionality and autonomy—or from where artwork emerges (positionality), and to what extent it operates autonomously of market pressures (autonomy), topics that will be returned to briefly later.

This depiction of the e-waste bricoleur thus taps into the symbolic potential of digital-waste dumps as places from which to activate the decayed promises of briefly lived appliances. As Jennifer Gabrys states in her seminal work on digital rubbish:

> The sedimentary layers of waste consist not only of circuit boards and copper wires, material flows and global economies, but also of technological imaginings, progress narratives, and material temporalities. Waste and waste making include not just the actual garbage of discarded machines but also the remnant utopic discourses that describe the ascent of computing technologies—discourses that we still work with today. (4)

Makerspaces, akin to literary texts, use an object like a broken computer and unpack its future possibility in ways that draw on multiple utopic discourses. In the African context, these include a potent combination of neoliberal corporate techno-utopianism from above, combined with emergent Afro-futurist discourses, and the residual effect of "failed state" or Afro-pessimistic narratives. These contested narrative modes are met by complex political realities. The possibilities of digital technologies to decentralize power, network communities, and offer new creative outlets, are offset by the privatization and enclosure of digital space (material and virtual) in Africa, regarded as the last "frontier" for the rollout of digital applications, networking systems, and computer hardware by dominant US multinationals like Google, Apple, Facebook, Amazon, and Microsoft.

A longer treatment of this subject would pay attention to the increase of critical literary Afro-futurist depictions of salvage and repair that respond to these dynamics, including ambiguous illustrations of techno-boosterism and narratives of "rising" Africa, with repaired technology operating as potential tools of state and corporate control. This includes Namwali Serpell's depiction of Jacob, a bricoleur whose innovative "Mosqueetoze" drones signify the corporate-state biotechnological risks and revolutionary potential of technology in the near-future Zambian section of her novel *The Old Drift* (2019); or Nnedi Okorafor's post-apocalyptic novel *Who Fears Death* (2010), in which the main protagonist Onyesonwu is described as an exemplary bricoleur, "one who used what she had to do what she had to do" (205; Samatar 177). Such accounts capture the ironies of deindustrialization and repair, or ecological ruin and social improvisation, as dominant themes structuring cultural responses to high-tech waste work. They also suggest culture's capacity in imagining political futurities that depend on reassembled relationships to waste and value—particularly those works that maintain what Adorno calls art's "immanent criticism" within their form and content, as a way of encoding and critiquing social tensions. It is this lack of artistic tension and autonomy that characterizes the witnessing force of eco-documentaries that, in their form, aim to "unveil" reality, without a recursive meditation on the nature of documentary film as art.

By way of a conclusion, and to maintain this article's focus on visual media and particularly on an irreal "bricolage" mode that eschews the pedagogical conventions of documentary, I will turn now to *Core Dump*, a video art piece by South African artist Francois Knoetze. *Core Dump* is an interlinked series of four films that explores the relationship between digital technology and neo-colonialism.[11] They are composed of found footage, performance art, and interviews—a play on the tradition of bricolage in mid-twentieth century "waste art"—to map e-waste's life-cycle or metabolic recirculation, from mined resource (DR Congo), to manufactured object (in the factories of Shenzhen), to transmitter of liquid capital (in New York City), to discard (e-waste dumps in Dakar, Senegal). Rather than depicting how e-technologies become naturalized "techno-fossils," e-waste in Knoetze's films is a way of unpacking the

[11] As of the time of publication, all four videos were available on the *Vimeo* site of the National Arts Festival, South Africa: https://vimeo.com/user118335060.

world-ecological colonial-capitalist relations that have underpinned Africa's unequal relation to European and American powers. Treating waste as elemental in Knoetze's film means attending to the circular and highly toxic lifecycle of rapidly obsolescing digital technologies, whose value does not end at the dump.

Knoetze's work is richly historicized, responding to Africa's consolidation as one of the earth's largest unevenly digitally routed populations into a global "techno-sphere," as part of an extractive dynamic of centuries-long impoverishment by which Africa was exploited for the material substrate of technological innovation (see Hecht). As Benjamin Bratton succinctly puts it, "From this same land, the Belgians took ivory, the Americans cobalt, and now *billions of Earthlings everywhere carry little bits of Africa around with them in their pockets*" (italics in original, 133). This extraction was not only about raw materials; it also consolidated slavery, capital flight, and knowledge privatization, dynamics that have enabled narratives of Western digital progress to, as Knoetze puts it, disregard the unequal racial underpinnings of technology and innovation to begin with.

Returning to *Core Dump*'s mode of critical visual bricolage, it includes archival material from African cinema, political speeches, and daily life, from figures like Leopold Sédar Senghor, Frantz Fanon, and Ousmane Sembène, to signpost Africa's liberatory Marxist political history, alongside performance pieces that rework colonial-era folktales. These include the Dakar movie's Afro-dystopian reference to a 1920s Congolese urban legend about cars, turning victims, who are "dazzled" in the headlights, into pigs or even pork pies for consumption by white colonialists (Knoetze 2018, "Kinshasa"; Tonda 2015, 106). Gabonese sociologist Joseph Tonda explains how this urban legend is a response to King Leopold's then recently ended colonialization of the Congo, as enchantment becomes an allegory for the infamously violent and dehumanizing tactics of Belgian colonizers. Or as Tonda puts it, *"Les éblouissements intensifient la réalité*" "the (car) dazzles intensify reality" (107, my translation; see also Gueye), with bystanders literally being turned into subjects for consumption by extractive modernity. In Knoetze's Afro-dystopian remake, a bystander is "dazzled" by car lights and becomes a pig (Fig. 3), while a spectral King Leopold, ornamented with broken phones and dressed in the garb of a military general, stalks the film, which ends with white diners (i.e. colonizers) turning into pigs who consume rubber milk and raw rubber before spewing out e-waste. The film powerfully illustrates how the insensate consumption of digital information and images is a form of exploitation built on historical extraction—a temporality that the film collapses by linking gothic urban legends of extraction, with the "dazzling lights of civilization" implicating viewers in a long chain of extraction and consumption (Knoetze "Kinshasa").

Figure 3: "Dazzling" car lights transform a bystander into a pig, Kinshasa. Still from *Core Dump.*

This method—of transposing older folktales or figures to critique the exploitation inherent in modern technologies—also occurs in the Shenzhen video, in which the West African Mami Wata water goddess (a figure who reappears in Caribbean mythology) is transplanted to China (Fig. 4). Significantly, Shenzhen is China's first Special Economic Zone and digital-manufacturing hub. *Core Dump*'s folktale bricolage here foregrounds the highly fraught relationship arising from Chinese multinationals operating on the African continent. This is not to collapse colonial histories, or to argue for a mere associative correspondence: the film details, as does Knoetze in his prose writing, how images of Mami Wata circulated in the DR Congo in 2012, sparking "rumors that Chinese laborers had captured her while they were installing underwater fiber optic cables in the Congo River" (Knoetze "Shenzhen"; Knoetze *Medium*). With Mami Wata's transplantation to Shenzhen, a privileged site for manufacturing and capital accumulation, old mythologies that have been displaced and recirculated due to the colonial slave trade find reactivated potential in reimagining the neocolonial relations of the present: these include the exploitation of Chinese rural workers by Foxconn, with pointed references made to "suicide nets," which fail to stop the death of the film's Shenzhen e-waste monster. This is not an easy connection to make: the film's excavation of Chinese capitalism in Africa could be sharper; but in a film about technology, the point is that digital narratives, particularly visual media, can recirculate and be reinterpreted indiscriminately—that is, without the critical trappings of context. That the film uneasily conjoins and flattens diverse interpretations of colonialism is part of the "short-circuited" and fragmented nature of hyperlinked digital media, a mode that the film exploits in its innovative aesthetic transhistorical bricolage of archival footage, sculptural role-playing, performance pieces, and graphic manipulation. Agbogbloshie's treatment by *Blade Runner 2049*'s art team as part of a tapestry of peripheral post-industrial sacrifice zones is here taken to its geo-historical conclusion by *Core Dump*'s insistence on presenting commodity supply chains as a loop, from extraction to manufacturing to information technology to waste, and back into a resource.

Figure 4: Mami Wata in Shenzhen, still from *Core Dump*.

To conclude, this article's analysis of different visual responses to e-waste in Africa has sought to challenge dominant eco-documentary responses to sites like Agbogbloshie as an exceptional toxic hazard. Rather I have examined how Agbogbloshie is a paradigmatic example of the consequences of technological obsolescence and decades of global waste colonialism by putting eco-documentary in dialogue with speculative narratives—from corporate techno-futurist framings of e-waste bricolage as the source of Africa's digital future, to critical innovative video art. This juxtaposition of different

interpretations of e-waste, as environmental scourge, business opportunity, and transhistorical "portal gun," has enabled us to probe the rich allegorical and metaphorical symbolism of e-waste: while arguing for a critical engagement with digital trash as a resource with its own set of "travelling" aesthetic characteristics. The Warwick Research Collective, in their world-literary analysis of peripheral literatures, argue for a reading of texts from regions subject to the expropriations of capitalist modernity for their "'generic discontinuities'" (Jameson qtd WReC 21), as a formal way of responding to temporally uneven contexts. Responding to this exhortation, future work will extend out this article to examine dismantling sites as "urban mines," probing multi-media responses to global waste peripheries and disassembly work that transcend the documentary impulse to formally register the *longue durée* of neocolonial dumping through modernist and irreal cultural modes, while gesturing to the world-ecological dimensions of such sites, dependent as they are on global dynamics of precarity, rubbish imperialism, extreme extraction, and commodity chain narrowing.

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