7 The Import of Secondhand Computers and the Dilemma of Electronic Waste

After the World Summit on the Information Society concluded in 2005, the attention of the national government and the business community in Ghana turned to a number of relevant concerns: the overtaxed electricity infrastructure, the influx of computers and other electronics as a burden on waste-handling systems, and the financial flows necessary for the business of enabling connectivity. Each of these issues illustrates a creeping awareness of the materiality of the Internet in Ghana countering a dominant rhetoric at WSIS that celebrated the transcendence of the material that would follow from joining the "information society." At WSIS, the instantaneous connection of the new network technologies was defined as a triumph over constraints of space and time.[1] The focus on information at the conference, as something formless and inexhaustible and to be made available to all of humankind, served as a savvy way to avoid all manner of intractable resource scarcity issues. This chapter works through some further issues of the political economy of the global Internet similar in scope to those raised in the previous chapter. However, by examining the hard infrastructural issues confronted in the actual build-out of Internet access in Ghana, this chapter serves as its counterpoint.

The primary substantive focus of the following sections is the emergent, ad hoc trade in secondhand computers imported from the United States or Europe by Ghanaian transnational family businesses. What is not considered in this chapter are some of the matters of Internet policy and network infrastructure that more regularly appear in academic analysis of technology and political regimes in the Global South. In Ghana there were some undoubtedly critical changes in national telecom policy in the early 1990s that paved the way for Internet access in general and the Internet cafés in particular. The subsequent founding of local Internet

service providers (ISPs), the physical network and its management, and the particular interactions between Internet café owners and the ISPs are additional topics in this space that potentially might have been considered in these pages. The omission of this history is not meant to indicate its irrelevance; rather, these topics are especially well covered elsewhere (see Foster et al. 2004; Wilson 2006). By contrast, the computers that equip the Internet cafés in Accra and that are an essential conduit to the Internet have a perhaps unexpected story of arrival and circulation in Ghana that has not yet been told. Furthermore, examining the circulation of these machines helps to translate the material ambiguity of the Internet to the concreteness of material objects. Tracing their movement and the actors involved in their import, sale, and disposal touches on matters of national politics within Ghana, state-to-state relations, as well as global economic trends.

In the Internet cafés, property tags remaining on many of the Internet café computers identified schools, businesses, and government offices in the United States and Europe as the source for this equipment. The property tags I encountered and documented included ones for the New York Public Library, Anne Arundel Community College (in Maryland), the United States Environmental Protection Agency, St. Mary's College (in the United Kingdom), the University of Iowa, as well as tags written in Italian and Dutch. Such machines were likely considered obsolete and cleared out en masse as part of an effort to update IT facilities in these US and European institutions. The machines themselves were several development cycles older than the state of the art. It took seven years or more from the moment when a computer first appeared in the market to when it arrived at the Internet café.[2] The discovery of these tags in the course of fieldwork inspired this effort to trace and explain the circulation of these machines. It ultimately proved to be an illuminating and novel way to explore the political economy of the Internet in Ghana while maintaining a direct and materially grounded tie to the cafés themselves.

The import and resale of secondhand computers has played an under-recognized role in the success of Accra's Internet cafés as a model of public access to the Internet. Affordable and reliable equipment is a basic necessity any Internet café requires in order to sustain itself financially. Such equipment must withstand the often heavy use cycles, in some cases running for twenty-four hours solid in the setting of the Internet café. However, the upfront equipment investment must also be low enough that

the occasional and unpredictable motherboard-destroying voltage spikes, periodic network and electricity outages, and repair costs can be absorbed by the business venture. These needs were met by Ghanaian traders through the development of this new distribution process, the trade in secondhand computers. This trade leveraged the short cycle of equipment obsolescence that is an established part of how Western (and especially US) consumer cultures regard electronics and high-tech commodities (Slade 2006).

In light of the ongoing discussion of marginalization that threads through this book, what is especially notable is the way these material requirements (unreliable infrastructure, twenty-four-hour use, and cost constraints) came to be addressed in Ghana by novel provisioning and distribution strategies rather than through product design. This may ultimately prove to be a larger trend whereby marginalized regions and their consumer cultures that are shut off from forums for influencing design proper (i.e., in the multinational corporations that initially define the specs, manufacturing process, and price points for these computers) instead find opportunities for agency and innovation in these later stages of a technology's life cycle. Ruth Cowan's influential work on the history of domestic cooking and heating technologies sets a precedent for considering distribution channels, manufacturing, and broader industry structures as critical to the success of a technology with consumers (Cowan 1987). In the current case this process of innovation was tied to the circumstances of a market largely invisible to or considered nonviable from the viewpoint of industry centers.

The broader ecosystem of distribution, repair, and disposal is necessary for the material support of Accra's Internet cafés. These cafés exist in the way they do because this supply of affordable machines is available. The nature of this supply furthermore had consequences for how users within the café engaged with the technology. Through this informal distribution channel, these computers arrived in Ghana lacking, at first, a strong framing narrative to indicate how users were expected to meaningfully or effectively employ them. The interpretive possibilities of the technology were not intercepted by dominant powers of the state or by foreign aid agencies. In an alternate scenario of state- or NGO-sponsored public access initiatives (such as the telecenters movement; see Roman and Colle 2002) efforts to shape Internet use may be carried out through training regiments

and can also entail censoring and precluding certain uses that are deemed illegitimate by funders and organizers. Multinational corporations that produce computing technology (such as Dell, Apple, Intel, Microsoft, etc.) may also intervene and shape interpretations through advertising and marketing campaigns but their involvement in Accra was minimal as indicated by a lack of advertising, retail outlets, and sales offices there. Arriving through the back door of the global trade system, users were left to make sense of computers and the Internet drawing on the sorts of resources they had at hand. They did so specifically through small media formats (rumor), peer relationships, and other kinds of institutions (such as churches and related structures of belief) as the previous chapters have testified.

That the international circulation of secondhand computers appears, so far, to be beyond the interest and attention of the high-tech sector is likely due to the fact that this postpurchase trade represents no additional contribution to corporate revenues. Furthermore, the work of individuals and businesses that make up this industry in Ghana was carried out without coordination by any associative body, without a voice representing their interests to the government or to the media. The industry was not much more than an aggregation of traders and trading families. Many of its key players lived or traveled overseas for much of the year. However, this trade in secondhand electronics has recently become very visible in a very selective way through coverage in Western media outlets of the electronic waste (e-waste) problem in developing countries. Ghana, along with Nigeria and China, are the countries typically singled out for attention. The coverage so far has included an Emmy-nominated *Frontline* documentary broadcast on PBS in the United States on June 23, 2009, titled "Ghana: Digital Dumping Ground,"[3] an article in *National Geographic* titled "High-Tech Trash,"[4] and a glossy photo slideshow of the Agbogbloshie dump site in Accra on the Web site of the *New York Times*.[5] US-based environmental organizations, including Basel Action Network (an NGO dedicated to the e-waste issue) and Greenpeace, have fueled and shaped some of this attention.[6] In a strategic overhaul of the terminology for describing this import process, used computers have come to be referred to as "toxic cyber waste" (Puckett et al. 2005, 2) and those involved in the trade as operating in a "shadowy industry" that exploits regulatory "loopholes"[7] with little awareness of the health and ecological harm brought on their compatriots and their homeland.

That the trade in secondhand computers has, as of late, come to be framed through this new discourse of e-waste rather than the previously dominant metaphor of the digital divide has certain implications for shifting political will on some relevant issues of international trade. The trade in secondhand goods, in particular, has come under the scrutiny of a number of national governments in Africa. New legislation has been proposed in recent years to alter duty calculations and enact new standards that place penalties on this industry. In Ghana the overtaxed electricity grid is a key issue that comes into play. On a visit in 2007 I witnessed for myself the crisis of rolling blackouts as low water levels left the principle source of electricity generation, the Akosombo Dam, at well below capacity in a country developing an increasingly insatiable appetite for electricity. One tangible action is Ghana's recently passed ban on the import of secondhand refrigerators initially scheduled to go into effect in January 2011 but then delayed to January 2013. This was justified as a measure to stop a non-necessity that is especially prone to electricity overconsumption.[8] This measure impinges on the secondhand computer import business because importers often put refrigerators alongside televisions, stereos, and computers in the same shipping containers. Despite quite distinct functionality, both commodities flow through this same distribution channels, are often sold side by side in shops, and belong to a single commodity category from the perspective of importers and retailers.

For now there appears to be no serious discussion in Ghana to extend the ban from refrigerators to computers or other secondhand electronics or to impose or raise import duties on these goods. In relation to the rest of the continent, Ghana remains an especially easy country to import computers into. The duties that are officially listed in Ghana's most recent customs tariff schedules show 0 percent import duty calculated on computers.[9] This applies to CPU units, any kind of computer monitor (CRTs as well as LCDs), and computer printers. There is also 0 percent import duty on parts for any of these categories of equipment as well. It should be noted that no distinction is drawn between used and new machines within the Harmonized Commodity Description and Coding System (shortened to Harmonized System [HS]), a standard employed internationally as a system of names and numbers for classifying traded products. Customs officers do, however, determine a monetary value at the point of entry, ultimately drawing such a distinction. A standard 12.5 percent VAT tax is

the only money collected by the government (apart from a 1 percent pro-
cessing fee) on these high-tech commodities. By comparison other com-
monly imported electronics, in addition to the VAT tax, are charged an
import duty of either 10 percent (for refrigerators, televisions) or 20 percent
(for energy-sucking air-conditioning units) of their assessed value. For
importers able to secure NGO status and who are bringing computers into
the country to be donated to schools or other educational institutions, the
VAT tax can be waived entirely.[10] By contrast, elsewhere on the continent,
Uganda recently passed a total ban on the import of secondhand comput-
ers along with a range of other secondhand electronics, explicitly pointing
to lack of waste-handling facilities as the reason, though the government
has more recently been backtracking on the planned computer ban.[11]
Kenya and Zambia have also recently begun considering such legislation.[12]
This is a reversal from the kind of international political pressure around
the turn of the millennium that called on low-GDP countries to reduce or
eliminate import duties on computing equipment in the interest of facili-
tating IT literacy among their citizenry. It is perhaps also an indication of
the success of those policies in bringing so many computers into the
country that they are now coming to be recognized as a waste and disposal
issue.

Strategies of Transnational Family Businesses in the Secondhand Electronics Trade

The import of secondhand electronics from the West to Ghana was a pro-
cedural innovation. It was sparked by the recognition of a growing supply
of surplus, well-functioning machines that were seen as low value or even
waste in the West, a supply then cultivated to be efficiently and profitably
redirected to Ghana. Ghanaian migrants who kept a foot in both worlds
played a critical role in facilitating this process through the formation and
coordination of small family businesses that operated across national
borders. There is an extensive literature on transnationalism that examines
the kinds of interconnected social units that escape being determined and
defined by the framework of a single nation-state (Ong and Nonini 1997;
Levitt 2001; Smith and Guarnizo 2002; Waldinger and Fitzgerald 2004;
Kivisto 2003). These social units do not necessarily constitute brand-new
social forms but rather rework the more conventional orderings of families

(Bryceson and Vuorela 2002), political parties, social movements (Guarnizo, Portes, and Haller 2003), or businesses. The family businesses maintaining a link between Ghana and abroad epitomize this concept. Their success rested on navigating and patching together the policies and opportunities of two countries and mapping a course between divergent consumer cultures. Business owners sought profitability naturally but also ways to employ and provide an income for multiple family members

Although the number of Ghanaians migrating internationally has been steadily increasing since independence in 1957, there is a sense that especially desirable destination countries have become increasingly restrictive, barring all but the most affluent and well-connected Ghanaians. This perception likely follows in part from the fact that the population of Ghanaians desiring migration opportunities has become larger and more diverse (Goody and Groothues 1977; Peil 1995). Over the years, the desire among Ghanaians to migrate out of Ghana or to return has been punctuated by government changeovers and other key events. The severe economic decline and famine of the 1980s prompted large numbers of Ghanaians to leave. Certain events and the policy changes of foreign states have also shaped and shifted the flow of voluntary labor migrants. The policies of the British government enacted in the early 1970s ended the prioritization of immigrants from British Commonwealth countries such as Ghana. More recently, the attacks on the World Trade Center on September 11, 2001, and the subsequent economic decline in the United States have added further restrictions. There is also a perception in Ghana that Muslim travelers are particularly unwelcome. One response has been the turning of attention to a more diverse set of destination countries with South Africa, Saudi Arabia, China, and Malaysia among others emerging as alternatives that put up fewer barriers and restrictions on entry (Burrell 2008).

The ongoing scarcity of travel opportunities has contributed to the status and prestige of Ghanaians who have gone abroad and returned and who were known colloquially as *burgers* (or bɔgas as it is sometimes spelled in Akan/Twi orthography). This term is an abbreviation of *Hamburger* and its literal meaning is a reference to one who lives in Hamburg, Germany, a city that hosts a large community of Ghanaians. The term has come to be more broadly used to refer to Ghanaians returning from any Western country. The La Paz area (home of the Sky Harbour Internet café) was also

an area where I was told that many bɔgas were operating secondhand electronics shops out of storefronts. As far as how family structure relates to the organization of these businesses it was generally a bɔga who was the primary owner and manager of the enterprise, the one who had invested his own capital as the initial start-up money for the venture. Siblings or nieces and nephews of the owner often did the in-country management of the business.

For example, one young shopkeeper Samuel who sold electronics that his uncle imported from the United Kingdom characterized the figure of the bɔga positively as one who is independent and who has experienced things. He added that such a person "knows business." The bɔga has people working for him rather than working for someone else. This was an enviable position that Samuel also aspired to. However, a more negative perception was that bɔgas could be "snobbish." This is how it was put by a scrap metal dealer named Ibrahim who works the other end of this commodity flow. Skepticism about whether the status of these bɔgas in Ghana was justified was evident in casual conversations and in representations in works of popular culture. For example, in a recent hip-life song titled, "bɔga, bɔga," the musician Sarkodie riffs at length on the way bɔgas claim a certain social superiority that is unwarranted given the reality of the very low status work such travelers often end up doing abroad. As the lyrics note, "Some bathe old ladies, wash underwear." Questioning the assumption of an automatic improvement in life circumstances by a move abroad, the song later suggests that if these bɔgas had stayed in Ghana they "would have completed school, would have been employed as a manager at Tigo." Tigo is one of the new mobile phone network providers in Ghana and employment there (as with the other providers) is employed as a sign of "making it" professionally. Nonetheless, by whatever means Ghanaians made their way while living abroad, the move abroad did prove in some cases to be a viable route for capital accumulation and for gaining certain advantages in trade as demonstrated by these importing businesses.

Data on computer imports from 2004 to 2009 obtained from the Customs, Excise, and Preventative Services of Ghana confirms that the trade in secondhand computers is, by and large, moving along the known labor outward migration routes of Ghanaians. In 2009 the top four countries from which computers were shipped were also the countries known

to have especially large populations of Ghanaian expatriates: the United States, followed by the United Kingdom, then the Netherlands, and Germany (see table 7.1).[13]

Visiting the many small shops that sold secondhand electronics in the neighborhoods of La Paz and Newtown and talking to traders there confirmed not only that Ghanaians living overseas were facilitating and funding these imports, but also that most of the employees involved in such businesses were relatives. Generally the boss or general manager of the business was the one who did the work of traveling between Europe or the United States and Ghana collecting the items to be imported and other family members handled the import and customs process, worked as shopkeepers, and as technicians doing repairs on any broken items when shipments arrived in Ghana.

For these bɔgas, the business of importing secondhand computers and other electronics tended to be a more recent add-on to other ways of generating income. Some of these importers had first gone abroad as many as ten or twenty years prior in pursuit of work, money, and education. The circumstances of the trip were generally only sketchily outlined in interviews. In one instance, while visiting one shop my research assistant and I were scolded by the importer's mother for even raising the sensitive question of how her son had gotten his chance to migrate. The importer himself was out of the country at the time. Scornfully she muttered in Twi, 'what kind of question is that?' A move abroad could take place through

Table 7.1

Computers Imported into Ghana by Country Shipped From (2004–2009)

Year	2004	2005	2006	2007	2008	2009
Countries	Quantity					
United States	26,915	13,984	11,944	13,820	11,807	15,180
United Kingdom	34,113	3,494	6,264	4,863	7,961	4,784
Netherlands	11,518	3,323	3,819	2,189	2,379	2,555
Germany	4,705	1,204	959	1,446	3,260	2,356
UAE	8,048	803	543	554	1,418	1,818
Belgium	3,774	1,673	1,707	1,750	946	1,127
South Korea	1,684	63	235	672	2,836	1,028
Italy	1,456	375	350	530	738	1,024
Canada	4,054	1,275	4,751	2,216	1,147	1,022

nonofficial channels. At another shop, the young shopkeepers admitted that a "connection man," one who could falsify documents or pay off the proper authorities, was likely involved in their uncle's emigration. Marriage to a foreigner was another circumstance that had generated a travel opportunity for some computer importers. For those who had migrated decades prior and through unofficial pathways, the ability to go into the import-export business was an outcome of many years of working toward the financial accumulations and legal status that enabled freedom of movement between home and host countries. Mobility itself, because of its scarcity, became a lucrative resource that savvy Ghanaian businessmen and businesswomen were able to leverage.

The exact source of the imported computers obtained by Ghanaian importers was also difficult to get those working in these family businesses to specify. This was, after all, what gave the business a competitive edge. Some mentioned buying from middlemen at auction, others visited flea markets, some collected machines one by one from individual sellers. One said he sourced computers online from his home in Germany. It was possible to distinguish importers who had better business connections (and possibly better technical knowledge) based on visual inspection of the machines on display at their shops. The age, condition, brand, and homogeneity of the machines gave some indication. A stack of machines that were the same model and with the same specifications were likely to be the ones coming from institutions, were probably bought in bulk, and had a known history and interchangeable parts making the inevitable repairs easier to carry out (see figure 7.1). The less savvy traders had a more random assortment of computers, some off brand and perhaps even with key components removed. One importer named Kennedy who operated out of a shop in La Paz had a stack of about thirty or forty mismatched computers brought from the United Kingdom, all of which had the hard drives removed before he purchased them. He admitted to lacking any particular technical knowledge about computers and did not do repairs in-house. Computers were not the primary good he sold or where he made most of his money. He sold these as untested machines at a lower price shifting the risk over to his buyers. Because Kennedy sold the machines untested he had no way of knowing how many were irreparably broken (unless buyers came back to inform him or complain) but such an unselective importing process seems likely to contribute more in the short term

Figure 7.1
Shop of a top local computer importer; some machines still bear the property tags that reveal their source—the New York Public Library

to the electronic waste problem than the practices of more discriminating importers.

An example of a well-organized and coordinated family-run chain of shops was the one known as G.K. Asare Enterprises.[14] The two shopkeepers there, Freeman and Samuel, offered some details about the history of this business and how they coordinated with their uncle in his moves back and forth between Ghana and the United Kingdom. The signboard at the shop identified them as "Dealers in Electrical Appliances [*sic*]." It also visually depicted taxonomically each of the appliances they sold, a common practice in Ghanaian signage and a way of handling the wide-ranging literacy and language abilities of potential customers. From left to right the signboard showed a flat screen monitor, CPU unit, keyboard, speakers, and computer mouse, laptop, iron, microwave, stereo system, television, and DVD/VCD players. At the front of the shop a sturdy wooden table displayed CPU units stacked eight high and six across. They were a mixture

of identical models and miscellaneous machines but generally ones I recognized as reputable brands: Compaq, Packard Bell, Fujitsu, and a few lesser-known ones. Each machine has a sticker on the front with three numbers written by hand: (1) the processor speed, (2) the amount of RAM, and (3) the size of the hard drive (e.g., P4 1.60/RAM 512/HDD 40 GB). A Pentium IV would be priced in the 170 to 250 cedi range (approximately $120 to $178) with the higher price including a monitor and peripherals as part of the package. These were the specifications that determined the price of the machine.

The day I visited the shop, the owner was away doing business in London. The shopkeepers were nephews of the owner and they worked as technicians and salesmen. They noted that their uncle went overseas generally for two or three months at a time. He had traveled to the United Kingdom for the first time about twenty years ago and began his import business (after many years of living abroad) bringing used vehicle engines into Ghana. Three years ago he turned to secondhand electronics because, as Samuel noted, he thought they would "move faster" (and thus repay the upfront investment quickly) unlike the engines, which could take months to sell. This family business had evolved over the years into a chain of shops. There were two other shops in addition to this one. Another one in the neighborhood was selling stereo equipment, secondhand refrigerators, and other domestic goods. A third shop was located in the city of Kumasi. The shopkeepers estimated that their uncle was filling and sending two forty-foot shipping containers approximately every three months.

Samuel and Freeman did work beyond simply minding the shop. Their uncle invested in his younger family members so that they could better contribute to the business. For example, Samuel was encouraged by his uncle to get training in computer hardware repair. He completed an A+ course at the local Wintech Professionals Training school (a tertiary school offering vocational training) to become a computer hardware technician. These skills he put directly to use in repairing and refurbishing the computers that were coming into the shop. Over time as the business developed, the uncle and his nephews had become more discriminating in their selection of goods to import as they came to know better what was in demand in the local market and what brands or models were easier to repair. The uncle called in periodically during his travels to get a reading on what would be worthwhile to import. The shopkeepers admitted that

there were some early mistakes bringing in "those types they can't sell or when broken they can't repair" and leading to a certain amount of excess being passed off to the scrap metal dealers. So in the interest of the business the young shopkeepers "advised him not to bring [such items]." Samuel estimated that around 10 percent of the computers (meaning the CPU units) could not be salvaged and ended up being passed on to the scraps dealers, generally due to damage to the motherboard.[15] This fairly low number (to the extent that it can be trusted as accurate) was a result of their selection process ("my uncle is very good at selecting goods," said Samuel) and the fact that he and two other hired technicians worked hard to test, repair, and refurbish as many of the computers as they could. They were paid per machine and earned money only for what they were able to get working again, creating a clear incentive to salvage whatever could possibly be salvaged. This shop sold only tested goods that were confirmed to be working in contrast to the computers imported by Kennedy. This meant that when a buyer came to pick out such a computer, the salesmen would plug it in and boot it up for the buyer to verify its functioning, a service that was offered in lieu of a warranty.

The work undertaken by traders in the final stages of attracting customers and making the sale involved negotiating within a particular local consumer culture that, like any other, dealt in aspiration and the formulation of new wants and needs (Burke 1996). However, there were some particular issues raised by the fact that these goods had already been used by Western consumers. Although commodity purchases inevitably rest on the customer imagining a future improved by the acquisition of a good (Slater 1997), for these goods it had to do with imagining not just the commodity's future but also its past. Beliefs about the source and history of used electronics shaped perceptions of quality.[16] There was also a terminology specific to the category of secondhand goods. Used goods that were imported from abroad, including computers and electronics, were referred to locally as *home used*. The word *home*[17] referred to the machine's home, that is, its original consumer market. Some of the traders and consumers I spoke with also suggested that *home used* meant the machines were collected from people's homes. The term was meant to highlight that such goods were held to US or European consumer standards and specifications. The signification of *home used* was a positive one meant to indicate that the computer was affordable and also a high quality and reliable good.

This was the term traders often used when pitching their goods and bargaining with customers.

There was a tension between traders and consumers apparent in the way these groups divergently characterized and imagined the history of these secondhand commodities. In bargaining, given that the trader's goal was the highest possible price and the buyer's goal was the lowest, the description traders provided of these origins was necessarily treated with some suspicion. Another commonly used term, *aburokyire bola* (meaning literally *garbage from abroad*), was mentioned as a specific sort of insult one might lob at a trader, for instance, when bargaining had broken down or if a customer felt slighted in some way. It is worth noting that the outward facing term in English is the one with positive connotations whereas the insult is communicated via Twi. Consistent with Sarkodie's lyrics about the low status work bɔgas do abroad, this term went along with a general suspicion that secondhand goods being sold in Ghana were literally being scavenged from European or American dumps by Ghanaian importers. Generally, aburokyire bola referred specifically to the kinds of imported goods that were especially outdated and worn—faded and torn clothing, dirty-looking items, or items with missing pieces. These were the sort of things that were "well and extensively used" as a financier of one import business noted diplomatically. Importers took pains to correct the perception that they were acquiring goods through scavenging. Asking about aburokyire bola often produced defensive reactions among traders. One importer clarified that the items he imported he paid good money for. He asserted, "I don't call it bola [garbage] . . . if someone is selling it, you are going to use the money to buy. So how can you use money to go and buy bola?" The reasons that such seemingly good-quality items had been disposed of also demanded some sort of explanation. A major market in secondhand clothing in central Accra was humorously referred to as *obruni wawu,* which translates to *white man has died,* casting the market as a massive, year-round estate sale. A frequent concern raised by consumers was about disease transmission, particularly with clothing items or bedding. Joyce, for example, lamented the sale of used mattresses[18] in Ghana and noted, "some of the white people get sick, they will sleep on it and when the person dies, they will bring it here and some people can get infected if there was a person [who] died with serious disease. . . ." So although the term *home used* was used to promote the possession of such imported com-

modities as a way of establishing an equivalence between Ghanaian and Western consumers, by contrast aburokyire bola was employed to cast doubts, suggesting instead that consumers of this class of goods are reduced to the level of selling or using the (literal) garbage of more privileged others.

Electronic Waste Dumping and Further Dimensions of Marginality in Ghana

Having introduced the topic of garbage, the next step to consider in the circulation of secondhand computers is the journey of the defunct and broken computers after they exit the Internet cafés, homes, and offices of Accra. In the process of examining this end stage in the life cycle of machine circulation, another distinct youth population came to light, one that challenged a more routine understanding of the nature of human-machine interaction and highlighted broader forms of engaging the technology. This population was composed of the young men and occasionally children working as scrap collectors, scrap processors, and scrap traders. Computer units, computer monitors, and peripheral devices such as printers are increasingly a substantial part of what they trade in. Young men pulling wooden carts filled with metal scraps had become, by 2010, a visible presence in the streets of Accra (see figure 7.2). This is something that was not common in 2004 when this research began.[19] The interest in computers among these scrap collectors and dealers was not, however, in its capabilities as an intact and functioning machine. Rather they perceived the computer as an aggregation of more or less valuable constituent elements—copper, aluminum, plastic, and other materials. The work of these scrap dealers, their way of engaging with a computer, was radically alternate to the work undertaken at the machine interface by Internet café users. Their activities question the assumption that a technology's impact on a population stems from whether and how users interact with the intact and functioning machine.

Ibrahim worked as a scrap metal dealer in the La Paz area. Similar to most people involved in the scrap metal business in Accra, he and his family were from the northern region of Ghana. Unlike his fellow scrap collectors and traders, however, his family had \been settled in Accra for a long time and his grandfather had established a family home there before

Figure 7.2
Young Dagomba men hauling televisions, a computer monitor, and other metal scraps in the La Paz area

Ghanaian independence in 1957. Ibrahim handled computers, monitors, and other defunct electronics as well as cars and car parts, iron sheets, iron bars and other building materials, domestic miscellanea, plastic goods, and more. He described himself as the "destroyer" for the area elaborating, "if something comes to me I have to destroy it. I doesn't repair. I destroy everything. . . . I used to cut cars into pieces and after I cut it, if they say I should repair it, I can't. I can use five minutes to cut a car [laughs] and if they give me ten days, I cannot repair it. So I have to call myself the destroyer. I always destroy." As his explanation indicates, Ibrahim defined his role according to a certain kind of power he possessed over material objects. Yet he joked in a self-deprecating way about the narrow specificity of the force he exerted. He could dismantle and obliterate with skill and efficiency but was totally incapable of reversing that process. He empha-sized in a positive way the physicality of such work in relation to his tribe and regional affiliation asserting, "Those people who are working in scraps,

they are the strongest men in Ghana . . . nobody have strong more than northerners in the whole Ghana." This work bore some similarities to other mechanical and machine-centered work, such as truck driving and auto repair, jobs that were disproportionately occupied by northerners and Muslims in Ghana.

Ibrahim was drawn to the work of scrap dealing by its low barrier to entry. In 2001 he had dropped out of carpentry school deciding that the burden that paying school fees placed on his family was too high. In scrap dealing, he found a job he was able to simply walk into without special training, degrees, or contacts. His mother gave him a modest sum to serve as his initial working capital, an amount of around $500 (5 million cedis in old currency circa 2001). This she acquired from the sale of a cow. He began straight away buying up metal scraps with this money to sell for a profit. He had arrived nine years later at an accumulation of around $5,000 in working capital, an amount he could continually reinvest in the business while still having enough money for daily needs and to provide financial support to his extended family. He had also found ways to augment his income by using his special position as a scraps trader to diversify his business endeavors. For example, two condemned cars he had acquired as scraps he was able to repair by enrolling assistance from his extensive social network of fitters (auto mechanics). Afterward he was able to get both vehicles operating as taxis. This generated a daily income for him that was enough to cover his basic needs. He was well connected with the many fitters in the area because they frequently had metal scraps to sell. Although he did not have the skills to do repairs himself, he certainly knew who could.

For scraps dealers such as Ibrahim, by far the most valuable component of a computer per pound was the copper wires that connected circuit boards, the power supply, and the ports inside the computer case. The copper wires had to first be removed from the plastic insulation they were encased within. Generally this was done by burning the wires to melt off the insulation. There was also a developing local market for the circuit boards. Many scrap dealers began collecting them on request from buyers. The buyers, as dealers noted, were typically Nigerians or Chinese. The Ghanaian scrap dealers who collected and sold these circuit boards did not actually know what was being done with these boards by the buyers but believed that they were being exported. The aluminum or iron frame of

the computer case was also valuable. Scrap dealers traveled with the iron and aluminum scraps they had collected to the nearby port town of Tema, where they sold these scraps to the SteelWorks or Valco factories for recycling. Several scrap dealers said they believed the iron scraps were being recycled into iron rods to be used as security screens installed over windows and for other similar uses. The plastic shell and whatever miscellaneous parts were left after these extractions were generally dumped as is or burned to reduce volume. Computer monitors, specifically CRTs, generally had only one component for which there was a local market. This was the yoke that functioned in the CRT to direct the electrons that project an image onto the screen. This yoke was composed of a large copper coil. The plastic cases were generally burnt or dumped along with the glass screen. It was only the valueless elements that ended their travels right there in the nearest garbage pile, the rest went back into circulation, some to in-country factories to be reincorporated into new commodities and some went further afield re-entering global flows of raw materials.

The way Ibrahim tells his story, he depicts his entry into the scraps business as a choice he made willingly and that offered him an avenue for autonomy and self-advancement. Nonetheless the roles in this industry were not homogenous and there was a clear hierarchy of jobs. Below him there were the scrap collectors who had only their laboring bodies to employ—no working capital, no facilities, and few tools. By 2010 the wooden carts of these scrap metal collectors had become a common sight. They were a constant obstruction to traffic in the already jammed roads, were honked at indignantly by taxis as they moved at a pedestrian pace through city streets. For these collectors, their work entailed scouring the city (and beyond) for these valuable scraps and then physically, manually hauling them to a scrap yard or collection point.

Much of what is contained in these carts eventually ended up in Agbogbloshie, a scrap yard and dump site situated along the Korle Lagoon in central Accra. Agbogbloshie is a sprawling site, Accra's major center for the activity of processing, trading, and dumping metal scraps. Although the territory belonged historically to the Ga people who retain ownership of the land, the current inhabitants, by and large, were Dagomba. Conflict among different Dagomba clans and in particular a long-standing chieftancy issue (known as the *ya-na incident*) carried over into the social relations within the settlement. In August 2009 violence flared up between

these two groups leading to a number of deaths but on more ordinary working days a visit to Agbogbloshie was more mundanely accompanied by the constant ringing of hammers thunking against metal and the acrid smell of burning plastic. Ibrahim's claim that the scrap metal industry involved the strongest of men in Ghana was convincingly demonstrated here. On one visit I saw several men leaning with every bit of muscle power they could muster to push forward an entire intact metal car frame balanced precariously on one of the standard wooden carts. The narrow but well-tread dirt trails threading through Agbogbloshie were traced and retraced all day, not only by scrap metal collectors, dealers, and buyers, but also by sellers offering food, water, air time cards for mobile phones, and a whole assortment of non-necessities, the typically extraordinary range of hawked goods. Just as the unfortunate circumstance of stalled traffic throughout the city attracted masses of hawkers, the revaluation and extraction of wealth from trash attracted similarly hardy microentrepreneurs. Along the main paved road that marks the boundary of Agbogbloshie there was a small mosque of cement block construction. A little further in, municipal government funding had established a football field that on one day hosted an informal game with teams who, lacking uniforms, played shirts and skins[20] while several men on the sidelines did a bit of betting on the outcome. Agbogbloshie supported a varied social world with provisions not only for industry and exchange, but also for religious practice and recreation.

Agbogbloshie could be subdivided into two areas, the scrap yard (as it is called) and, on the outskirts, along the banks of the Korle Lagoon, the *bola* (dump site). This area had been in flux for decades, settled only to be periodically cleared by the authorities. Reports of a proposed "clearing exercise" were once again appearing in local newspapers through 2009 and 2010. Agbogbloshie and the adjacent residential slum area provocatively named *Sodom and Gomorrah* were to be pulled down and vacated as part of the Korle Lagoon Restoration Project, though the threatened expulsion seemed to be indefinitely on hold.

At the furthest edges of Agbogbloshie, not in the scrap yard but in the bola, was where most of the apocalyptic images of sooty young men and billowing smoke that began appearing in the Western media were captured. This reporting drew attention to the issue of electronic waste export from the United States and Europe to developing countries. In the bola,

the workers tended to be still younger than those in the scrap yard, teenagers rather than twenty-somethings. One fifteen-year-old I spoke with said he had migrated from the north by himself without family to accompany him or to receive him in Accra. The work these youth were doing was the simple processing of small amounts of copper scraps using self-fashioned tools to make money for their survival. They burnt the plastic insulation off copper wires, using chunks of insulation extracted from old refrigerators to focus and conserve the heat. The plastic insulation, for safety reasons, is fire resistant, making it difficult to burn. Young women with plastic bags of chilled water observed, sitting on overturned plastic computer monitor cases reappropriated as impromptu stools. They sold the sealed plastic bags of water they carried to these scraps processors who used them to suffocate the fires (see figure 7.3).

The work taking place in Agbogbloshie brought forward a whole new set of unanticipated risks stemming from this emerging computer trade and from the Internet café scene that was a source of demand for such

Figure 7.3
Extracting copper at the Agbogbloshie dump site in Accra

equipment. Local ways of processing through uncontained and open burning releases toxic substances harmful to the environment and to human health. The insulation around copper cables are typically made of brominated plastics (used for its flame retardant properties) and they release halogenated dioxins and furans on burning, substances that accumulate in the body once exposed and at high levels are known to be carcinogenic (Ladou and Lovegrove 2008). These chemicals are also known to suppress the immune system, interfere with hormone levels, and reduce reproductive capacity.[21] The CRT computer monitors (along with the television sets that were dumped alongside at the site) were especially troubling, containing only the small copper yoke that was of any value in the local market and large amounts of lead that was used to insulate against the radiation emitted by the internal components. Lead exposure can lead to damage to organs and to the central nervous system and reproductive system. Children are known to be especially sensitive.[22] Though the glass in CRTs was junk and wasn't purposefully processed or recycled, in extracting the copper yoke and getting rid of the valueless remnants it was inevitably smashed and left lying where all the lead, which had previously been suspended in the intact equipment, was free to seep into the soil or was pushed into the lagoon where it became a water contaminant. Among the scrap dealers, collectors, and processors in the bola and elsewhere I found that there was little knowledge or concern about any health issues related to material and chemical exposure.

These stories of the bɔga traders, the shopkeepers and technicians such as Samuel and Freeman, Ibrahim the successful scraps dealer, and the laboring scraps collectors and teenagers piecing together their survival from extracting and selling copper cables are all linked together by this flow of secondhand computers. Their diverging relationship to the computer also makes visible further divisions of center and periphery within Ghanaian society and helps to better situate the relative social circumstances of Internet café users in Ghana, the population that was the principle focus of previous chapters. A generational divide between youth and their elders and specifically the marginalization of the young by the old has been considered already. This chapter adds to this mix those populations inhabiting the economically depressed northern regions of Ghana as well as the general division between urban and rural populations. There is the marginalization, for example, most acutely felt by very recent migrants making

their way within the urban center but without territorial claims, language skills, or expansive social networks. The various zongo neighborhoods in Accra, where large Muslim populations lived often characterized with a broad brush by outsiders, actually varied substantially as far as the duration and continuity of their existence. The neighborhoods of Nima and Mamobi already existed at Ghana's independence. A number of the young Internet users in Mamobi had been born and raised in Accra and were not confined as narrowly by small language communities. They spoke fluent Twi, the urban lingua franca, and often quite good English as well. They benefited from an education in urban schools and other resources whose quality tends to correlate with population centers. By contrast, the scraps collectors at Agbogbloshie typically were first-genera-tion migrants, many arriving in the city only a few months or a year prior. The current Sodom and Gomorrah zongo adjacent to Agbogbloshie had formed only since the early 1990s or so. Many residents were part of a displaced population rather than voluntary migrants. Some number of these residents had fled localized conflict in the upper eastern region of Ghana. A marginalization related to the internal geography of the nation-state can be made concrete and visible to observers through the diverging ways of relating to particular commodities such as computers and other electronic goods.

Different social histories and political and economic resources may yield dramatically different ways of engaging with a technology. Scrap dealing was a particular mode of engaging an artifact (if not precisely a form of use in a conventional sense) that involved dividing the machine into homogenous elements, sorting out what was materially valuable toward recommodification. The gain was monetary in converting "junk" into something saleable. The work done on the machine through dismantling, burning, and sorting was a manipulation meant to add (marginal) value. Lacking the language abilities, literacy skills, money, and patience to engage the technology through the functionality of the human-machine interface, the scrap handlers brought an entirely different set of resources (the laboring body, physical strength) to bear on the artifact. Accounting for the scrap dealers in Agbogbloshie as another youth population shows how Internet access and use also implicates a necessary ecosystem of dis-tribution, repair, and disposal. The dramatically different forms of engage-ment by the scrap metal dealers on the one hand and the Internet café

users on the other ultimately map out very different distributions between the benefits and costs of engaging a technology.

Conclusion

The process of coming to terms with the, at times, harsh materiality of the Internet could potentially reshape the terrain of Internet access in Ghana in the future. Changing commodity flows and new regulations may follow from emerging domestic and foreign political pressures. This chapter has reconsidered the problem of electronic waste by looking holistically at the distribution channel that transports secondhand computers to Ghana and specifically the role played by Ghanaians in actively constructing this channel. So far, the formulation of the e-waste problem in Ghana by journalists and activists has not accounted for the distinctions Ghanaians themselves draw between what is reusable, what is valuable, and what is truly waste. Furthermore, the role played by Ghanaians as traders and the reasoning they attach to their involvement in this industry is largely excluded from such a depiction. The full set of issues at stake in this import process are much broader than this issue of waste handling alone. In addition to the way this particular commodity flow is harming the local environment and the health of those handling these machines, there are converse benefits to technical skill development and the employment of Ghanaian technicians who repair and refurbish nonworking machines locally and the technology access and utility that reused machines are providing to the general population in Internet cafés as well as in homes and offices.

   From discussion with the computer importers themselves, the amount of true waste generated from a shipped container of secondhand or home used electronics seemed likely to vary substantially according to the different ways Ghanaian importers organized their businesses. This included their particular business skills as well as technical knowledge about the goods they were importing. Some importers were more discriminating and selective and better connected with supplies of quality secondhand machines than others. In terms of solutions, the emphasis of activist groups has been largely on the need to better regulate and enforce restrictions on the export of such used electronics from Western countries.[23] The need to set up proper waste-handling facilities in these e-waste destination

countries has received much less emphasis by such groups. The center of gravity of this debate, in this way, remains situated in the United States and Europe. Yet the electronic waste issue is not a problem limited to secondhand machines but encompasses new equipment as well. All machines, after some period of time, will eventually become a waste-management issue so the in-country issue, as long as there is demand for and use of computers in Ghana, remains unresolved.

This chapter and the last bookend the six-year period during which the fieldwork for this book was undertaken (beginning with nine months in 2004–2005 and most recently seven weeks in 2010). They manage to capture the waxing and waning of interest and enthusiasm for the latest development solution—ICTs and specifically computers and the Internet. At what was possibly its climax following shortly after the dot-com boom, the global WSIS conference promoted the UN version of a utopian information society. The alarm over electronic waste is evidence that critical reconsideration is now well underway. The *Frontline* documentary on Ghana's e-waste problem makes a connection between this sense of promise followed by disillusionment noting, "when containers of old computers first began arriving in West Africa a few years ago, Ghanaians welcomed what they thought were donations to help bridge the digital divide" adding that this yielded only junk and new avenues for facilitating a criminal underworld.[24] Reviewing the history of development solutions, such a cycle appears all but inevitable. India's green revolution brought modern agricultural practices to boost crop yields but was met later with alarm over environmental degradation, overconsumption of certain farming inputs (water in particular) that led to social conflict, and the vulnerability of farmers to global markets and spiraling debt (Gupta 2000; Jasanoff 2002; Shiva 1991). The microfinance movement has recently been similarly reconsidered with concern over new bank lenders taking advantage of the poor.[25] Furthermore, academic work on borrower households found evidence of how loan programs sparked family conflicts (Rahman 1999). However, in the case of information and the Internet as a development solution, this cycle uniquely centered on renegotiating the materiality of what were previously presented as immaterial digital flows. The promise of a cost-free information revolution in this narrative arc came to be transformed instead into a literal river of waste.