BORN WITH A COPPER SPOON

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Worlds of Copper?

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And copper is smelted from ore.
Man puts an end to darkness,
And searches every recess
For ore in the darkness and the shadow of death.

– Job 28: 2–4 (NKJV)

Copper is an ancient commodity in human societies – mined, processed, traded, and worked for all of recorded history. Only comparatively recently, however, has the metal come to occupy a vital role in our world. Zambia's first president, Kenneth Kaunda, once remarked that Zambians were "born with a copper spoon in our mouths," and his observation applies much more widely.[1] Arguably, much of the modern world was born in this way. The malleability, durability, tensile strength, resistance to corrosion, and, perhaps above all, conductive properties of copper made it the key ingredient of the Second Industrial Revolution and the first wave of globalization in the late nineteenth century. Indeed, as the essential component of undersea telegraph cables, copper literally connected the world.[2] The lengthening of the day through artificial light, the generation of electric power, and the global spread of telecommunications all required copper, and their expansion was dependent on ever-increasing copper production.

Where did all this copper come from? How was it produced, distributed, controlled, and sold on an ever-increasing scale? This book is about the causes, mechanisms, and consequences of the globalization of copper and about the material practicalities of globalization: that is, the production and control of copper. Humanity did indeed search "every recess" for copper, and the metal was produced in increasing quantities beginning in the mid-nineteenth century by an industry that became tightly integrated and global in scale. However, this is not simply a narrative of ever-increasing and -deepening global connections, as global history often is. This book is also about periods of deglobalization, fragmentation, and attempts to sever connections. This was especially the case in the mid-twentieth century, when a bitter contest over ownership of mineral resources briefly threatened a major realignment of the world economy. Copper's status as a global industry has waxed and waned.

This book is a global history, specifically about one of its richest subfields: commodity histories. We use and expand the concept of the "world of copper," initially coined by Chris Evans and Olivia Saunders to describe a globally integrated production system that connected the smelters of South Wales to copper mines across the globe between 1830 and 1870.[3] Although this particular system eventually disintegrated, we expand the meaning of the concept and identify consecutive worlds of copper. The Welsh system was followed by an American world of copper – one driven by American capital, companies, and technologies between 1870 and 1960 – itself replaced by a postcolonial world of copper between 1960 and 1990, in which producing states took control of their national copper industries and attempted to wrest control of global copper markets. The copper world is referred to as a historical regime marked by several defining features: underlying institutions, organizations, labour practices, and global connections and interactions. Analyzing these features and practices as markers of different worlds of copper is the main approach used in this book. Using this concept brings more analytical rigour to the field of commodity history, galvanizing the endeavour to use commodities as a lens through which to investigate global integration. The copper world offers a useful tool for periodization as well as analysis, one that could be expanded to other global commodities. The book is focused chiefly on the American world of copper that gained shape with the Second Industrial Revolution but eventually disintegrated in the face of resource nationalism and a shifting geography of production. Control over the rewards of copper production was central and marked the lives of workers and communities across the globe.

In exploring different worlds of copper, the chapters of this book stretch from the early nineteenth century to the early twenty-first century and cover North America, Latin America, Europe, Central Africa, the Middle East, East Asia, and Oceania. Some chapters are comparative, others explore connections, whereas others are single case studies on how localities were incorporated into this global industry. Contributors cover finance, technology, labour, cartels, ownership, environmental destruction, and global connections and politics. Of course, these topics are not exhaustive on the subject, but together they show that the story of copper is necessarily a global one.

For many centuries, copper production and consumption rose and declined by relatively modest amounts. Data from copper concentrations in ice cores drilled in Greenland suggest that there were peaks in copper production in Europe in the first century CE and in China in the eleventh century CE and that annual world production probably did not exceed the levels reached in the Roman Empire during the first century CE until around 1800.[4] After iron replaced copper and bronze in the manufacture of tools, weapons, and household utensils around 2000 BCE, copper occupied a modest role in human societies in the centuries that followed; principally, it was used in coinage but also for roofing, bells, jewellery, decoration, and military equipment.[5]

This changed with the onset of the Industrial Revolution.[6] Initially, however, what changed was not the scale of production but its geographical spread. In the 1830s, new metallurgical processes allowed the industry to break away from the geographical confines that had characterized it since its inception: that copper ore had to be smelted close to where it was extracted.[7] This inaugurated what Evans and Saunders termed "a world of copper," centred on Swansea in South Wales but "properly global; that is to say it directly embraced every continent."[8] Buoyed by newly acquired colonial markets, English and Welsh copper industries revived in the early eighteenth century and had become the world's largest producers by the end of the century, making South Wales well placed to take advantage of new technology.[9] Swansea received ore from around the world and "became 'Copperopolis,' the hub of a global production network, mobilizing capital, labor, and technology over immense distances."[10] These economic connections were embedded in a web of imperial connections as many regions providing copper came under British imperial control, and even in territories outside the British Empire, such as Chile, Britain exercised effective economic control.[11]

The Welsh copper world was supplanted by a much larger one. Both the scale and the scope of the copper industry beginning in the mid-nineteenth century distinguished it from what came before. Two technological developments were key. The first was the first transoceanic cable, which required copper, laid across the Atlantic in 1866, and the second was Thomas Edison's development of an electric lamp requiring copper wire to supply the electricity. Both demand for copper and copper production consequently increased exponentially with the spread of electricity and telecommunications.[12] In 1850, estimated world copper production was approximately 55,000 tons, and by 1910 it had reached almost 900,000 tons. Growth slowed during both world wars but accelerated in the long economic boom following the Second World War, and world mine production increased by 4.8 percent annually between 1950 and 1970.[13]

The copper industry's expansion beginning in the mid-nineteenth century seems like the unfolding of nature's bounty at timely intervals but involved considerable changes in mining and processing technologies, labour, financing, and transportation. Several of these changes were prefigured by the first world of copper, especially in Cuba.[14] Huge geographical distances between production sites and consumers came to characterize the copper industry. Already in the mid-nineteenth century, capital and labour were mobilized internationally while companies lobbied against what they regarded as onerous regulations and taxation, strongly echoing current debates.

Rapid expansion of the copper industry increasingly centred on the United States, and American companies dominated the industry for decades. Annual American copper production was only an estimated 112 short tons in 1845 but subsequently rose almost every year for the next eight decades, reaching almost 840,000 short tons by 1925.[15] The United States displaced Chile as the world's largest copper producer in the early 1880s and retained that position for almost a century.[16] Copper mining, smelting, and refining were essentially American concerns.[17] Prolonged American dominance of the copper industry, however, masks greatly altered forms of production and shifting centres of production within the United States.

This enormous expansion in American production began with the development of rich deposits in Keweenaw Peninsula in Michigan in 1845. Michigan dominated American production until the 1880s, when even larger ore bodies were discovered at Butte in Montana (termed "the richest hill on earth"). Montana was then eclipsed in the late 1900s by Arizona and other southwestern states, where production occurred on an ever-larger

scale. Here the US-Mexico border bisected what was effectively one mining region as large mines in northern Mexico were brought into production in the same period and controlled by the same companies that owned the mines in Arizona.[18] Control over this production was highly concentrated. This period was marked by the "Copper Kings," hugely wealthy men who held sway over powerful enterprises and local politics, such as Markus Daly and William Clark in Butte or, later, Daniel Guggenheim and John D. Ryan. When these men managed to find common ground, their joint actions had a decisive influence on the global copper market. Many of them had a touch of odd showmanship and a bizarre affinity with the material. Ryan, the president of Anaconda, was reportedly buried in a copper coffin.

Copper production itself changed markedly in these years in ways that would have major consequences for the spread and development of the industry. Technological changes in mining and processing that were literally groundbreaking allowed for ever-greater quantities of copper to be mined and processed. The decisive change occurred in 1904 when Daniel Jackling introduced open pit mining at Bingham Canyon in Utah to exploit low-grade copper deposits on a hitherto unimagined scale. Deposits previously considered uneconomical could now be opened for extraction. The average grade of ore mined in the United States consequently declined steeply, from almost 6 percent in 1890 to less than 2 percent by 1920.[19] Underground extraction was increasingly displaced by open pit mining. There are few human activities so thoroughly destructive to their immediate environments than open pit mining. Timothy LeCain argued that open pit mining techniques should be placed in the same category of importance for economic history as Fordist mass production and mass consumption, provocatively suggesting the concept of techniques of mass destruction to define a revolution in mining.[20]

Open pit mining enabled huge increases in output and labour productivity, and the technology was portable and spread around the world, opening new frontiers of production. By the 1930s, the United States was responsible for less than one-third of world production.[21] Latin America was the premier site of expansion for American technologies. In the 1900s, the Guggenheim family, whose wealth came from the American copper industry, financed Chuquicamata in Chile, which later would supplant Bingham Canyon as the world's largest open pit, along with a vast underground mine in the Chilean Andes, El Teniente. American companies used their resources and expertise to revive and dominate Chile's copper industry, and between

1912 and 1926 Chilean copper production increased almost fivefold.[22] Peru too became a major copper producer, and in 1901 American investors created a new conglomerate, the Cerro de Pasco Corporation, to exploit the copper deposits in the Peruvian Andes.[23] Beginning in the 1910s, American capital partly financed new mines in Northern Rhodesia (Zambia), part of a region termed the "Central African Copperbelt," which one contemporary labelled as the "greatest individual copper mining center of the world."[24] New mines were also opened with technologies and practices adopted from the United States but without American capital, as was the case in Japan, which became the second largest copper producer in the world by 1915, and in Katanga, the part of the Copperbelt situated in Congo. The Japanese state consciously adopted new technologies to revitalize and expand its copper industry. These new technologies and the greater scale of production required deep pockets and close ties with major banks and financiers. The Rothschilds, Guggenheims, and J.P. Morgan came to play an outsized role in the copper industry.[25]

As copper extraction and production became a more capital-intensive industry, it relied on large numbers of workers in often remote places. Copper miners often have been depicted as stridently militant and copper mining camps as crucibles of industrial confrontation.[26] Studies have pointed to geographical isolation, harsh living and working conditions, and dependence on a single industry as drivers of industrial militancy.[27] There has been significant scholarly attention to the role of the copper industry in proletarianization, particularly in Central Africa and Latin America, and to company policy on new workforces.[28] Company policies to control and manage labour unrest ranged from outright repression – the conventional strategy in the United States in the early twentieth century – to paternalism and social engineering. Corporate paternalism emerged strongly after the First World War and often aimed at being all-pervasive by trying to regulate the domestic and intimate lives of workers outside the workplace. In particular, corporate policies sought to discipline women in the mining camps and turn them into mineworkers' wives and housekeepers.[29] These paternalistic policies were not limited to private companies and often intensified under state ownership after the wave of nationalizations in the 1960s and 1970s and were challenged by local residents.[30] The fact that the changing ways of copper production tremendously affected social relations plays an important role in our analysis, and we aim to move beyond the workplace and look at the lives and social relations of people not employed in the mines and smelters. We employ a comparative and global perspective,

which, as Stefan Berger noted, can "shed light on both commonalities and differences of mining communities."[31]

Huge open pits and industrial complexes of underground mines employing several thousand workers have tended to attract the greatest share of scholarly attention, but these features did not constitute the entire industry. Smaller-scale producers proliferated, and a "dualistic structure" emerged in the industry in which small- and large-scale producers coexisted.[32] The geographical extent of copper production continued to expand. Smaller mines operated in Namibia and South Africa, and new mines opened later in the twentieth century in Mauritania, Uganda, Iran, and Papua New Guinea. Production also continued in older centres such as Cuba, Spain, Sweden, Norway, and Cyprus, the island that gave the metal its Latin name *cuprum* and chemical symbol Cu.

Significant change occurred beginning in the mid-twentieth century, as discussed below, with the end of American dominance in the copper industry, eroded by the shifting geography of production over the century and then curtailed by the nationalization of the assets of American mining companies. Most of these formerly dominant corporate hegemons soon ceased to exist as oil companies, the new dominant multinational extractives, began to buy mining companies in the late 1970s. New state-owned firms, however, immediately had to contend with a major world recession in the mid-1970s that led to a protracted slump in the industry. Copper prices remained low until the early 2000s.

The last decades of the twentieth century saw several pivotal shifts in the global copper industry, including the continued decline of the United States. First, China greatly increased production and became a major global player after joining the World Trade Organization in 2001. Chinese copper production surpassed that of the United States, Peru, and Australia, and China has become the second largest copper ore producer after Chile and by far the largest copper consumer.[33] Second, the industry saw increasing concentration through mergers and acquisitions, which made the companies more multinational and less dominated by the United States. These trends are conspicuous features of the globalization boom since the 1990s, which seems to have made the global copper industry more multi-centred.

Humanity still needs copper, and demand continues to increase. Low-carbon technologies and the electrification of transportation systems will require yet more copper. The analysis of different worlds of copper, and how they relate to power, socio-environmental impacts, politics, and business, is increasingly relevant today.[34]

Global History and Commodity Histories

This volume owes a considerable debt to two comparatively recent and overlapping historiographies: global history and commodity histories. Many commodities already have found a prominent stage in the literature: bananas, beaver pelts, cod, cotton, guano, salt, sugar, timber. Commodity histories typically follow the global production process of a material transformed into a commodity destined for consumption, and often historians have focused on consumer goods and how their availability has facilitated changes in the social interactions and identities of consumers.[35] Unravelling such ties leads to insights into how the world is connected, often in invisible ways, and how changes in patterns of production and consumption inadvertently and usually adversely affect communities and ecologies elsewhere in the world. As Sven Beckert noted in his study of cotton, "by focusing on one specific commodity – cotton – and tracing how it was grown, transported, financed, manufactured, sold and consumed, we are able to see connections between peoples and places that would remain on the margins if we embarked upon a more traditional study bounded by national borders."[36]

It is not hard to see how commodity-centred historiography fits into the agenda of global history. Ever since global history gained shape during the 1990s and 2000s, the focus on exchanges and connections has been a central component. Yet the zealous effort in commodity history to reconstruct connections is often "totalizing," and it remains hard to take structural lessons from the many connections that constitute complex global systems.[37] In the meantime, global historians increasingly are also going beyond connections as the guiding principle. Connections, often varying in intensity and impact, are not sufficient in themselves to explain global integration. In that regard, commodity history is less about reconstructing the world created by production, trade, and consumption and more about explaining structural changes. Applying a commodity-centric perspective, we can see how copper production fundamentally transformed social relations in different parts of the world.[38] That is one of the central perspectives of this volume.

Not all commodity histories are about exploring connections. Some have taken a clearer approach, relevant to this book, focusing on the global political economy and the issue of power. Such issues have been investigated in regard to minerals such as tin and bauxite. In both instances, private companies were a driving force. New global commodity chains after 1850 created challenges for firms in terms of supply chain management and "retaining value along the different stages …, several of which may be outside its control."[39] States, however, increasingly responded to forms of global

market integration that dominated global commodity chains, especially since several minerals were considered to be of strategic value. The Second World War was a catalyst in that respect. After the Second World War, new postcolonial states challenged the global chains and increasingly contested their role as raw material exporters to the industries of Europe and North America.[40] Issues of political economy and its periodization are particularly relevant to copper as well. Governments also regulated access to copper, especially in the context of war. Ownership and control of copper assets in many states in the Global South are of key importance.

Commodity studies offer an important perspective because they examine the interactions between sites of production and consumption often geographically distant from each other or where different stages of production were dispersed geographically. Commodity histories have induced a shift in the history of industrial capitalism in a global perspective. As many cases have shown, raw material production is not simply the by-product of industrialization but also constitutes important dynamics on its own, offering ever-cheaper volumes of commodities and foods to industries and workers. Such processes have been indispensable to industrialization. They highlight the important but easily forgotten role of global frontiers and the countryside. For many economists and historians, industrial revolutions have been and remain the main sources of global changes and developments, requiring new inputs and larger inputs, as elegantly put by J.A. Schumpeter:

> These revolutions periodically reshape the existing structure of the industry, by introducing new methods of production – the mechanized factory, the electrified factory, chemical synthesis, and the like, new commodities, such as railroad service, motorcars, electrical appliances; new forms of organization – the merger movement; new sources of supply – La Plata wool, American cotton, Katanga copper, new trade routes and markets to sell in and so on.[41]

Global commodity history has turned such thinking upside down. One of the key elements of Gregory T. Cushman's work on guano is that it shows how experimentation with guano "established the ecological basis for input-intensive agriculture … [as] an important prerequisite for the spectacular growth of human populations and industrial economies … The sheer scale of these endeavors was significant, but their main importance stemmed from their ability to eliminate bottlenecks that limited production."[42]

In his account of cotton production, Beckert emphasizes its penetration worldwide and how that relates to practices of slavery, expropriation, and colonialism: "Too often, we ignore the countryside to focus on the city and the miracles of modern industry in Europe and North America, while ignoring that very industry's connection to raw material producers and markets in all corners of the world."[43] Clearly, commodity histories have brought the supply side of the world economy back into focus.[44] The implications of this focus are not straightforward, and there has been renewed interest in practices and places difficult to align with modern capitalism but in fact part and parcel of it.

The same argument could be made here for copper (and producer goods more generally).[45] Although there was a huge industrial demand for copper, supply did not follow demand in a straightforward manner. New technologies brought larger and cheaper amounts of copper onto the world market, and Ken Curtis has argued that the abundance of copper perhaps created a context in which technological revolutions such as electrification could take place.[46] By the same token, it is arguable that new technologies and practices of mining are equally important to "launching" industrial capitalism. This is a salient argument and could revive older discussions on industrial revolution and development. In a similar vein, Christopher Schmitz noted that the rise and dominance of American mining companies as huge integrated enterprises controlling the extraction, processing, and distribution of the commodity from mine to consumer resulted from the material, geological, and frontier conditions of production.[47] This links to what we want to do in this book: an obvious advantage of a commodity-centric approach is that it reveals how commodities are produced and traded. In sum, by creating a new narrative on the global history of copper, this book contributes to the field of commodity histories by looking beyond connections toward issues of structural change and successive processes of integration and fragmentation. In doing so, the book contributes to a rereading of the history of industrial capitalism from the points of view of its peripheries and supply chains.

Worlds of Copper

In this book, we conceive of different and successive worlds of copper. The world of copper centred on Swansea was already in abeyance by the mid-nineteenth century and replaced and dwarfed in scale by one centred on the United States. Evans and Saunders seem to suggest that the American

system was less global and characterized by "a nationally bounded, protectionist industrialization," with a tariff wall beginning in 1869 and increasing vertical integration.[48] These systems were closed circuits designed to improve national economies, linking the American mineral frontier to industrial development. Later many other copper-producing countries hoped to achieve something similar.

The vastly expanded copper industry was certainly centred on the continental United States beginning in the late nineteenth century – though progressively less so after the 1900s – but was not confined to it. The American world of copper rapidly became one of big business, and American capital, expertise, and control over refining enabled American dominance in the industry outside the nation's borders. The Anaconda Copper Mining Company was the "prime example of large-scale, integrated enterprise," expanding from its base in Butte to control the mining, smelting, refining, transportation, fabrication, and sale of copper.[49] Other firms followed suit, and a few of them became multinational businesses.

The copper industry came to be characterized by a high concentration of ownership, what Alfred Chandler termed a "global copper oligopoly," which effectively controlled the industry during the first half of the twentieth century.[50] American companies controlled not only the industry in the United States but also most large-scale copper mines elsewhere in the world, notably in Mexico and Latin America but also in Central and Southern Africa. Expansion continued under a strong degree of stability in the industry. In 1948, the world's largest copper producers were largely the same as those in 1917.[51] These companies were at the zenith of their power and ambition in the interwar period, and they made several attempts to control and boost copper prices.[52]

The American-dominated copper world that began in the 1880s represented a different form of globalization. Although it lacked a central node like Swansea, it was nevertheless tightly integrated at a global level. New copper mines were linked to different industrial centres, to refineries on the American east coast, such as Waterbury ("Brass City") and Perth Amboy, or to refineries in France, Belgium, and Germany. American engineers travelled the world, spreading new technologies and organizing large-scale production based upon ideas of Taylorism and racial segregation. Moreover, American domination never equated to exclusivity. Before the First World War, the trade in copper was virtually monopolized by German metal traders such as Metallgesellschaft.[53]

Central in this analysis is that different systems structured the global copper industry over the past two centuries. Connections mattered within that system, but developments could also occur in synchronous ways. Global copper worlds as historical regimes did not change overnight but unfolded over a longer period of transition. Looking at the transition from the one system to the other is a useful way to study the global worlds of copper and to highlight their underpinnings. It is clear that a different set of new technologies, from the Welsh furnaces to the American steam shovels, could unsettle existing arrangements in the global copper industry. In much the same way, political control driven by an agenda of resource nationalism eroded global corporate power after the Second World War. Likewise, company paternalism continued to shape the lives of workers until the 1990s, even though the companies that had first implemented these policies had largely disappeared.

To us, the concept of copper worlds serves as an instrument to periodize and narrate the history of copper as a global story, but it also serves as an analytical tool. Different copper worlds are historical regimes that evince certain common patterns, macroeconomic and political ones that are also shaped by local social relations. In this regard, the use of copper worlds offers the solidity and rigour needed to go beyond an excessive focus on connections in global history and particularly in commodity history. We build upon the notion of the Welsh world of copper (1830–70) to describe its successor, the American world of copper (1870–1960), which had different actors, rules, and institutions. It existed in an international political economy that linked mineral extraction to industrial development in nationally or imperially contained circuits. Corporations were tremendously powerful on both global and local levels; they not only controlled the international market but also designed sewage systems in mining cities in the Atacama Desert or the Copperbelt.

This situation would not last. Writing in 1975, Mira Wilkins outlined how Anaconda was the classic global enterprise and how in 1970

> Anaconda had a marketing organization to sell its nonferrous metals with sales offices in London, Frankfurt, Milan, Paris, Buenos Aires, Tokyo, Bombay and Calcutta. For its mill and manufacturing products, it had a separate marketing organization, which included five sales offices in Canada. By that year, it was mining in Chile, Mexico, Canada, Jamaica and Australia, refining in Chile and Mexico, producing alumina in Jamaica, manufacturing in Canada, Mexico and Brazil.[54]

Eight years later the company had ceased to exist, its Chilean mines nationalized, its American operations shuttered and soon declared one of the nation's worst ecological disaster zones. Anaconda was not the only casualty. A wave of nationalizations throughout the copper industry during the 1960s and 1970s ended a model of tight corporate control. The American copper world was replaced by something else: a postcolonial world of copper, built by state power, economic sovereignty, and state-level international cooperation. It was a short-lived world since the ideas of neoliberalism and private ownership emerged with renewed force during the long slump in the copper industry. Nevertheless, it shattered an existing regime of global production. Crucially, we stress south-south relations as a globalizing force and how practices and ideas of nationalization and resource nationalism travelled and were put into practice. Ideas about national sovereignty and ownership of natural resources often had transnational origins.

The decline of the American copper world was both generated and reflected by changing geographies of production. In 1920, North America, Western Europe, and Australia produced over 75 percent of world copper mining output. By the mid-1970s, this picture had altered dramatically: the developed world's share of world copper production had fallen to 35 percent, whereas production in Africa, Asia, and Latin America had risen to 46 percent.[55] The changing locations of production were accompanied by changes in ownership, from multinational mining companies to state-owned mining companies as Chile, the Democratic Republic of Congo (then known as Zaire), Zambia, and Peru took majority ownership of their domestic copper industries. In the early 1960s, only about 2.5 percent of copper production outside the Eastern Bloc was controlled by the state. By 1970, over 40 percent of production was state controlled, and this rose further still in the 1980s.[56]

The wave of nationalizations involved mutual support among producer nations, which formed the Intergovernmental Council of Copper Exporting Countries (CIPEC). Reorganizing the industry along national lines became widely accepted among copper-producing countries. This decisive political intervention seemingly shifted the balance of power dramatically away from private multinational mining companies toward states in the Global South. Corporate expertise and initiative were consciously supplanted by the state. In this process of national reorganization, alternative forms of global connections appeared that went beyond the coalescing efforts of CIPEC. Chile's decision to nationalize its copper industry influenced Zambia, and Zambia's experience in turn was studied by Papua New Guinea. Processes of learning

and emulation prevailed in the Global South. In 1975, Papua New Guinea and Indonesia together with Yugoslavia and even Australia joined CIPEC. The United Nations had endorsed the previous year the demand for a New International Economic Order (NIEO), which would have established a new international framework for the copper industry. An international copper agreement was subsequently negotiated under the auspices of the UN Conference on Trade and Development (UNCTAD) in the second half of the 1970s, and it was supposed to stabilize prices to the benefit of both producers and consumers. Yet a coalition of copper consumer countries of the Global North successfully obstructed the establishment of an international commodity agreement for copper with market-intervening powers, with significant consequences for the industry.[57] Whereas CIPEC crumbled, the consumer coalition was able to set up the International Copper Study Group in 1992, whose purpose was simply to promote market transparency.[58]

Yet, throughout this attempt to wrest control of the industry, there was a remarkable continuity of certain principles. State control over industry, marking the end of the American world of copper, was predicated on the similar aim of using copper extraction to fuel domestic industrialization and expanding processing to export refined copper instead of ore. It was about turning the abundance of natural resources into national economic growth. Moreover, some institutions created during the Swansea-centred world of copper proved to be remarkably resilient. The London Metal Exchange (LME), created during the heyday of Swansea copper, is still a central institution for copper markets. Producer nations were unable to contest its role in determining copper prices.

The LME endured to witness the emergence of another copper world in the late twentieth century, one very different from that envisaged by UNCTAD and the copper producers of the Global South. Weak investment, poor productivity, and dependence on revenue from volatile copper prices had forced producer nations into the hands of Bretton Woods institutions, which made neo-liberal policy reform and privatization a condition for loans and aid schemes.[59] Legacies of the NIEO discourse nevertheless lingered, such as the System for Safeguarding and Developing Mineral Production established by the European Commission in 1979 to provide financial assistance to mineral exporters if prices fell as part of the Lomé agreements. This mechanism largely targeted Zambia and other copper exporters with dwindling export revenues but had a marginal impact compared with International Monetary Fund and World Bank interventions.[60] Chile also partially privatized its copper industry but has made a remarkable exception for

Codelco, still a state-owned company in 2022 and the world's largest copper producer.

Hence, from the 1980s onward, the copper world took a neo-liberal turn, which prevails as we publish this book. Although observing this turn, we acknowledge that certain features established in the late nineteenth century proved to be durable even in the period of deglobalization with conscious efforts to craft a new global copper economy. The LME has served increasingly as a copper market of last resort for traders, producers, and stockpile administrations, and it continues to play a role in establishing international prices. Its pivotal role moved American copper producers to connect their pricing to the Commodity Exchange in New York. An Asian copper exchange was set up in Shanghai. The commodity exchanges endured as the main market institutions of the global copper world. They connected copper warehouses around the world and developed new instruments for copper traders. Unsurprisingly, price volatility has prevailed.

This neo-liberal world of copper would be recognizable to an observer from a century ago for other reasons. Some of the biggest mines are still the same, including Chuquicamata and El Teniente in Chile and Morenci in the United States, and concentrated ownership is again the norm. Privatization was followed by a wave of acquisitions and mergers. In 2020, the ten largest producers were responsible for almost 50 percent of world copper mine production, and nine of the ten are private companies.[61] Copper is still overwhelmingly produced for export.[62] Consumption, however, has shifted decisively to China, which became the world's largest consumer in 2002. China's copper trade volumes increased by 119 times between 1975 and 2015 and accounted for almost 50 percent of world copper smelter production in 2020.[63] We anticipate that China will put its imprint on the copper world for decades.

Structure of the Book

This book analyzes different worlds of copper as consecutive stages into which the global copper industry can be divided. These stages reflect different patterns in terms of global political economy as well as local practices and social relations. The book is focused on the American world of copper (1870–1960), its rise and demise, though some chapters deal explicitly with the Welsh system and others with the postcolonial world of copper. Even though the idea of consecutive worlds of copper is central to this book, we have chosen a thematic perspective rather than a chronological ordering. Highlighting and comparing changing aspects of different copper systems

will be more helpful for readers, particularly those interested in global history as well as the history of copper itself. We are interested more in explaining, comparing, and contrasting different aspects across different worlds of copper than in setting them out in a deceptively smooth chronological order. This thematic approach reveals striking similarities among ideas of national economic development based upon enjoying the benefits of the "copper spoon," be it in Japan in 1900 or Zambia in the 1970s. The idea is that thematic perspectives give insights into how different worlds of copper worked from local and global points of view. Moreover, a chronological and encompassing synthesis accords poorly with the diversity of scholarship that essentially marks global history today. The chapters do not adopt a uniform approach or historical scale. A thematic approach does better justice to the diversity of approaches in this book and the analytical value of the copper world as a historical regime. Diversity is a strength of global history, and this book subscribes to that message.

The book is organized according to three different perspectives rooted in global history and commodity history. The first part focuses on connections and entanglements, the second part on local perspectives and the impacts of copper production on local communities, and the third part on the relationship between national control and global forces as a central dynamic in the global history of copper.

The first part – "Connections, Technologies, People: Creating the Global Fabric of Copper" – focuses on the more connective aspects of different worlds of copper. Chapter 1 – by Klas Rönnbäck, Oskar Broberg, and Dimitrios Theodoridis – reveals changing investment patterns in the international copper mining industry in the century following the start of the Second Industrial Revolution. Despite the global growth in copper demand, the authors show that investments in copper mining did not generate exceptional returns. The continuous opening of new mines caused enduring competition, which constrained prices, but profits and returns often were high after "frontier mines" started up their operations. Chapter 2, by Nathan Delaney, presents an overview of an important institution that undergirded the globalized market of copper following the expansion of the Welsh system, namely the LME. Delaney sheds light on the tremendous regulatory power of this institution, which effectively broke one of the largest copper cartels – "the copper corner" – in the 1880s, an event that also provided an important impetus to mining in North America. Chapter 3, by Duncan Money, and Chapter 4, by Jeremy Mouat, are rooted in an entangled global history of migration and transnational encounters, revealing the ideas and mobility

behind the American world of copper. Money focuses on the emergence of mining engineers in the United States and how their profession was instrumental in spreading new technologies, creating racialized labour management techniques, and making different mining sites across the globe similar to each other in a variety of ways. Mouat focuses on how and why American methods of mining became dominant at the end of the nineteenth century through a system that favoured explicit information sharing and "transferability" of technologies. This system contrasted heavily, he argues, with the more closed Welsh system. Connections also mattered in untying the American world of copper. South-south connections played a crucial role in resource nationalism in Bougainville and Zambia, as Ingeborg Guldal and Frida Benda Jenssen show in Chapter 5. Using a transnational and comparative approach, they show how both newly independent nations sought to use the copper industry to consolidate their sovereignty. Papua New Guinea explicitly sought to learn from Zambia's experience with the copper industry in charting its own national development.

The second part – "Grounding Copper: Communities and Socio-Ecological Transformation" – focuses on how copper production affected local communities and their social relations, building upon a rich research tradition on how social and labour relations are formed in the frontiers of production. Moreover, it is an effort to understand global copper systems through local communities. A defining feature of all copper worlds is the enormous impact on livelihoods and the environment. Chapter 6 – by Ángel Pascual Martínez-Soto, Miguel Á. Pérez de Perceval, and Susana Martínez-Rodríguez – examines how Cuba's mines were a crucial component of the internationalizing copper industry in the mid-nineteenth century in the Welsh system. Capital and, crucially, labour were mobilized internationally for these mines, and copper was mined by a mixture of free and unfree labour, including enslaved Africans, freed slaves, indentured Asians, Cornish miners, and workers from the Canary Islands. Chapter 7, by Iva Peša, explores how global developments were refracted at a local level in the Central African Copperbelt. Utilizing oral history, Peša goes beyond traditional studies of mining communities as she looks at how mining paternalism affected the lives and work of those who did not work in the mines. The long history of paternalism helps to explain why mining communities seldom protested the large-scale environmental pollution caused by the mining industry. Chapter 8, by Brian Leech, tackles the issue of forced relocation because of mining activities, focusing on the case of Bingham Canyon, a town literally swallowed by the expanding open pit mine in the early 1970s. The

displacement of this community was complicated by the fact that it was brought into existence by the mine and then destroyed by it, as has been the case for many communities built around mines. Chapter 9, by Erik Eklund, looks at the copper industry in Australia in the early twentieth century, where the industry was structured by an early form of resource nationalism. Intervention from the national government to remove German firms, which previously controlled much of the industry, during the First World War reduced global linkages and led to the formation of a more national industry, one in which the government sought to protect small-scale producers.

The third part – "Haves and Have-Nots: Copper in the Age of National Control" – examines the global political economy and countervailing tendencies to globalization in the copper industry. It explores how the national and the global interacted, showing how different national copper industries were strongly inspired by and modelled on developments abroad. National control over copper industries and processing became a central feature, not only during the American world of copper but also in the postcolonial one. These more national systems of production were themselves the products of global interactions. In Chapter 10, Patricia Sippel explores how Japanese experts and engineers, who witnessed copper mining operations abroad first hand, increasingly framed the development and necessity of a copper industry as a national enterprise. Sippel offers a new transnational perspective by focusing on Japanese mining engineers and experts and their overseas travels. Chapter 11 presents a similar tale for Katanga in the Democratic Republic of Congo. Robrecht Declercq focuses on the role of American mining engineers in the construction of a vertically integrated commodity chain that connected the mineral ores of Katanga to a newly established mineral-processing industry in Belgium, effectively producing one of the strongest ties of dependence between Belgian Congo and its metropole. The American technologies and template practices of vertical integration brought along by these experts offered a model for Belgian capitalists to control one of the most vital colonial industries for decades. The next two chapters examine the breaking up of corporate power in the copper industry in the 1960s–70s. In Chapter 12, Abdolreza Alamdar and Ali A. Saeidi highlight the relatively unknown story of the Iranian copper industry. Iran had a manufacturing industry supplied through copper imports, and the authors argue that the Sarcheshmeh copper mine, the world's second largest in the 1970s, originated in a deliberate government policy of import substitution in the 1960s. The Iranian government made successful efforts to keep control out of the hands of foreign corporations, although it was dependent on

foreign expertise. Employees of the remnants of Anaconda working directly for the Iranian state under conditions controlled by that state were a far cry from the American mining engineers outlined in Money's chapter and a good illustration of how the fortunes of the company had altered dramatically. Chapter 13, by Ángel Soto and Alejandro San Francisco, brings forward the story of the Chileanization of the copper industry, an effort considered of national importance to reverse external control of Chile's copper industry. The politics of this nationalization were rooted deeply in the history of American domination of Chile's copper industry and produced a political consensus about the need for the state to have an important role in the industry, even as the country became sharply divided politically in the 1970s. This development was of tremendous importance to domestic politics and had strong global resonance. Ideas of nationalization and resource nationalism became widespread, and the global copper oligopoly was replaced by intergovernmental negotiations and agreements, revealing a deep divide between consuming countries in the Global North and producing countries in the Global South. The final chapter of this book, Chapter 14 by Hans Otto Frøland, investigates the relationship between resource-dependent countries and resource-producing countries and the importance of stockpiles in creating bargaining power for the former. This relationship culminated in negotiations to set up an international commodity agreement for copper under UNCTAD in the second half of the 1970s. Frøland argues that the Global North successfully counteracted the efforts of CIPEC. As an overview of the international political economy of the postcolonial world of copper, his chapter serves as a fitting end point to this book.

NOTES

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