THE RISE AND FALL OF THE AMAZONIAN RUBBER SHOE INDUSTRY:

Technology, international trade, and manufacturing in the early 19th century

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ABSTRACT

This paper examines the rise and fall of the Amazonian rubber shoe industry in the early 19th century. At first glance, the industry's trajectory resembles other vibrant, home-grown Latin American manufacturing ventures eventually decimated by goods mass-produced elsewhere. A closer look, however, reveals that this Amazonian industry was not really home-grown and its decline was mostly superficial, as the underlying relations of production remained unchanged. Ultimately, this episode suggests not an anomaly in the evolution of capitalism, but an early example of the inequalities it creates: while American merchants fostered and seized a stream of opportunities to move ahead, their Amazonian counterparts reacted to changes they could not anticipate and had to shift exclusively to raw material production.

1 – INTRODUCTION

A traveler who visited the Brazilian Amazon in 1840 would have arrived through Belém, a city of approximately 13,000 inhabitants that extended for eight or nine blocks from the river's edge before fading into the tropical forest.[1] In Belém, commercial life revolved around the port which

[1] David Cleary, "'Lost Altogether to the Civilized World': Race and the Cabanagem in Northern Brazil, 1750 to 1850," *Comparative Studies in Society and History* 40, no. 1 (1998), 119

was visited by approximately 65 ocean-going ships a year.[2] Typically, foreign vessels anchored far from the shore and used smaller wooden boats to unload their cargoes of flour, tobacco, candles, soap, cloth, and fripperies.[3] Meanwhile, native canoes of all sizes arrived from the hinterland bringing brazil-nuts, cacao, annatto, sarsaparilla, balsam of copaiba, dried fish, and fruits to be sold locally and overseas.[4]

The most striking sight, however, would have been provided by the enormous quantity of Amazonian rubber [foreigners called it "India rubber"] shoes being loaded for export. These shoes were en route to European and American cities, which had grown in both wealth and filth. In New York, ladies with parasols walked amidst feral pigs that chewed on cabbage stalks while avoiding the vagrant dogs that pursued them.[5] In Victorian London, conditions were arguably worse.[6] In both continents, people travelled extensively on foot and longed for adequate protection from the mud, trash, horse manure, and human waste that accumulated underneath.

Washable, elastic and waterproof – rubber shoes made in the Amazon found an eager urban clientele. Between 1825 and 1855 Amazonian producers exported almost five million pairs of rubber shoes to the United States and Europe - an average of 166,000 pairs per year for

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2 Discurso recitado pelo Exm. Sr. Doutor João Antonio de Miranda, Prezidente da Provincia do Pará, na abertura da Assemblea Legislativa Provincial no dia 15 de Agosto de 1840, 76

3 United States Consul Charles Jenk Smith at Para to Secretary of State Daniel Webster, no 36, December 13 1842, 'Statement of Cost of Produce Exported from Para, Brazil to the United States During the Months of July, August and September, 1842,'" *Despatches from United States Consuls in Para, 1831-1906, vol. 1*, microfilm roll no. 1, Washington DC, The National Archives; William Lewis Herndon and Lardner Gibbon, *Exploration of the Valley of the Amazon, Made Under Direction of the Navy Department* (Washington, D.C., 1854), 296

4 Daniel Kidder and James Fletcher, *Brazil and the Brazilians: Portrayed in Historical and Descriptive Sketches* (Philadelphia 1857), 551; Henry Walter Bates, *The Naturalist on the River Amazon: A Record of Adventures, Habits of Animals, Sketches of Brazilian and Indian Life, and Aspects of Nature Under the Equator, During Eleven Years of Travel*, *3rd edition* (London, 1875), 2

5 Charles Dickens, *American Notes for General Circulation* (New York, 1842), 34

6 Jackson, Lee, *Dirty Old London: The Victorian Fight Against Filth* (New Haven, 2014), 4

30 years.[7] Sales were quite robust, and neither the economic panic of 1837 nor a 30% import tariff imposed by the US government in 1842 significantly dampened demand (see figure 1).[8] Sales peaked in 1841 when the US imported 462,000 pairs of Amazonian shoes, or one pair for every 31 Americans, excluding slaves.[9] Attuned to this opportunity, American entrepreneurs tried to manufacture rubber shoes at home but they could barely compete. In 1843, American manufacturers controlled only 25% of the American rubber shoe market while Amazonian imports retained the remaining 75%.[10] This difference in consumer demand was echoed in market prices. In Boston, crude rubber to be processed further fetched five cents a pound while a pair of Amazonian rubber shoes cost from $3.00 to $5.00.[11]

This trade was quite relevant to the Amazonian economy as well. In 1842, rubber shoes constituted the Amazon's fourth largest export[12] and fetched more than twice the price (FOB per weight) of crude rubber.[13] While a representative basket of Amazonian products paid a weighted average of 17% in export tariffs and petty charges, rubber shoes contributed at the highest practiced rate of 22%.[14] According to another source, the total tax rate on Amazonian shoe exports reached 70%.[15]

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7 Thomas Hancock, *Personal Narrative of the Origin and Progress of the Caoutchouc or India-Rubber Manufacture in England* (London, 1857), 157-165.

8 Cynthia Clark Northrup and Elaine C. Prange Turney, *Encyclopedia of Tariffs and Trade in U.S. History: The Texts of the Tariffs, Vol. 3* (Westport, Conn., 2003), 51.

9 Hancock, *Personal Narrative*, 159; US Department of Commerce, "Historical Statistics of the United States: From Colonial Times to 1970" (Washington DC 1975): 16-18

10 Henry L Norris and J.T. Armstrong, "Extract from the Report of the Committee on India Rubber Goods", in *Documents of the Senate of the State of New York*, 67th session vol. IV (1844):42

11 The North American Review vol 101 (Boston 1865):69

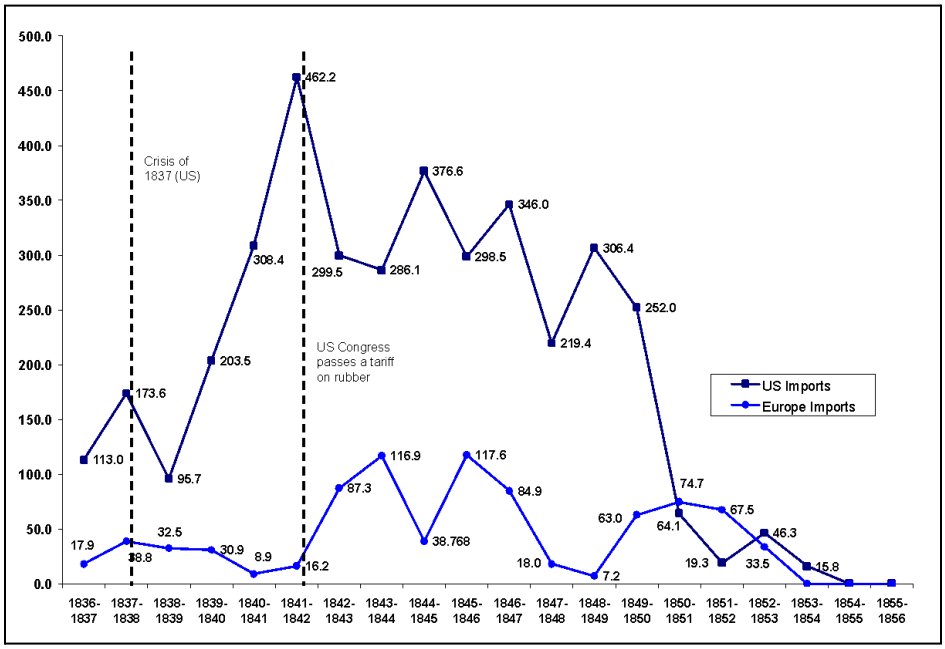
12 "Tabela consolidada de exportações," *Treze de Maio* (August 14, 1840).

13 "United States Consul Charles Jenk Smith at Para, 'Statement of Cost of Produce'

14 "Tabela consolidada de exportações," *Treze de Maio* (August 14, 1840); United States Consul Charles Jenk Smith at Para, 'Statement of Cost of Produce'

15 Ernesto Cruz, *Historia da Associação Comercial do Pará* 2a ed. (Editora UFPA, Belém, Brazil,1996), 96

Figure 1. Brazilian Exports of Amazonian Rubber Shoes ('000 pairs).



Source: Thomas Hancock, *Personal Narrative of the Origin and Progress of the Caoutchouc or India-Rubber Manufacture in England* (London, 1857), 158-164.

Seeing this success, some observers predicted that sales of Amazonian shoes would continue to increase.[16] Extrapolating forward, it seemed that the region could become an industrial hub, a producer of either specialized footwear or rubber goods in general. Obviously, this prediction did not come to pass. A traveler who visited Belém in 1855 would not have seen a single pair of rubber shoes in town. Instead, he would have seen blocks and slabs of crude rubber being loaded for export. It was the onset of the Amazon rubber boom, the period (1860-1912) when the region became famous for supplying this crucial input to rubber factories in the US and Europe.

This reversal raises two empirical questions. First, how did the Amazon acquire an internationally competitive rubber footwear industry *before* it became almost exclusively an

[16] Warren Dean, *Brazil and the Struggle for Rubber: A Study in Environmental History. (Cambridge,* 2002), 15.; Charles Goodyear, *Gum-Elastic and its Varieties* (New Haven, Conn., 1853), 97

exporter of crude rubber? And second, why did this industry collapse so quickly and fade away so thoroughly that few people now know it ever existed?

At first glance, the rise and fall of the Amazonian rubber shoe industry seems to emulate that of indigo, cochineal, henequen, and other home-grown Latin American products that achieved remarkable export success before the mid-19th century but were eventually displaced by mass-produced or synthetic substitutes invented elsewhere. On closer inspection, however, the trajectory of the Amazonian rubber shoe industry reveals a different story. First, and as this article shows, this industry was not really home-grown, as it only came into existence after US merchants and retailers stepped in to convert the marginalized artisanal practices of Amazonian peasants and river traders into viable exports. And second, superior products invented in other nations only killed the Amazonian rubber shoe industry in a superficial sense, as the underlying relations of production and exchange that buttressed the rubber shoe industry remained in place to propel the Amazon rubber boom (1860-1912) that followed it.[17] In the end, the rise and fall of the Amazonian rubber shoe industry suggests not an anomaly in the progression of capitalism, but an early example of the inequalities that it creates: while American merchants kept on fostering and seizing novel business opportunities that moved them ahead, their Amazonian counterparts simply adapted to market changes they could not anticipate and embraced an economy based on the export of raw rubber, with all the limitations that it entailed.

[17] Barbara Weinstein, *The Amazon Rubber Boom 1850-1920* (Stanford, 1983)

2 – THE SALEM MERCHANTS TRAVEL TO BRAZIL

The history of the Amazonian rubber shoe industry can be traced to the American city of Salem, Massachusetts at around 1810, when it was a port in decline. Salem was established during colonial times, one of many New England towns with a natural harbor and a fishing fleet. Its economy thrived during the Revolutionary War against Great Britain (1775-1783), when the American government authorized local sea captains to act as privateers.[18] After the war, these mariners engaged in the profitable re-export trade[19] and gradually accumulated enough capital, equipment, and expertise to pursue arbitrage opportunities around the globe.[20] By 1800, ships from Salem sailed regularly around the Cape of Good Hope to exotic-sounding locations in East Africa and Asia. At each stop, the crew assessed market conditions, sold some or all of their goods, bought new products, and then proceeded to the next destination.[21] A complete voyage could last more than a year. Some ships were lost at sea, but successful captains returned to Salem with plenty of hard currency plus luxury items such as silk, ivory and gold to be sold at home. At its peak around 1805, Salem had the highest per capita income in the US, and several of the merchants who prospered during these years left estates valued at a million dollars or more.[22]

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18 Robert Ephraim Peabody, *Merchant Venturers of Old Salem: A History of the Commercial Voyages of a New England Family to the Indies and Elsewhere in the XVIII Century* (Salem, Mass., 1912), 45-7.

19 Donald R. Adams, "American Neutrality and Prosperity, 1793-1808: A Reconsideration," *Journal of Economic History* 40, no. 4 (1980): 734-5.

20 Peabody, *Merchant Venturers of Old Salem*; Arbitrage is the buying and selling of commodities in different markets within a short period of time to profit from the price difference.

21 National Park Service, Peabody Museum of Salem, Essex Institute, *Maritime Salem in the Age of Sail* (Washington DC, 1987)

22 Benjamin Woods Labaree, *Patriots and Partisans: The Merchants of Newburyport, 1764-1815*. (New York, 1975); Robert Booth, *Death of an Empire: the Rise and Murderous Fall of Salem, America's Richest City* (New York, N.Y., 2011).

In the early 19th century, a series of domestic and international setbacks triggered Salem's decline. In 1807, the US government responded to British acts of aggression by enacting an embargo on international trade. The embargo was lifted two years later, but by then US export earnings had fallen 64%.[23] In 1812, war broke out between the US and Great Britain, causing American merchants to lose both their claim to neutrality and access to the re-export trade.[24] Finally, to pay for the war, the US government raised tariffs from an average of 21% in the two decades prior to 1812 to 37% afterwards[25] and this measure caused trade to decline even further.

These events were particularly harmful to merchants in smaller ports such as Salem, as they did not have the same access to deep harbors, large labor pools, banks, and inland markets as did competitors in Boston or New York. Facing decline, they pursued three overlapping strategies. Some merchants moved their fleets to growing ports elsewhere in the US.[26] Others invested in domestic manufacturing.[27] And some entered the carrying trade: instead of sending their vessels in long and circuitous routes to search for arbitrage opportunities around the globe, they sent their ships on shorter round trips to sell US products abroad and buy raw materials for the nascent American industries. Many ships travelled to Nova Scotia to fetch firewood. Others sailed to Zanzibar to buy gum-copal, a tree resin used to make wood varnish.[28] From 1810 onwards, merchants also sent their ships to South America to buy horns, hides,

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23 Douglas A. Irwin, "The Welfare Cost of Autarky: Evidence from the Jeffersonian Trade Embargo, 1807–09," *Review of International Economics* 13, no. 4 (2005): 631-45.

24 Douglas A. Irwin, "New Estimates of the Average Tariff of the United States, 1790-1820," *Journal of Economic History* 63, no. 2 (2003): 510.

25 *Ibid.,* 508-9.

26 National Park Service, *Maritime Salem in the Age of Sail*

27 Report of the Committee Appointed to Enquire into the Practicability and Expediency of Establishing Manufactures in Salem (1826)

28 Ralph Delahaye Paine, *The Ships and Sailors of Old Salem* (Boston, Mass., 1927), 443.

cacao, molasses, sugar and coffee.[29] Belém, located near the mouth of the Amazon River, was their most popular destination in the continent.[30]

The First US Rubber Industry

During these trips to the Amazon, American sea captains saw rubber and became intrigued by it, but initially they did not know how to market this product. Europeans had been importing rubber since 1750 and using it in a variety of ways.[31] Some enterprising individuals cut blocks of rubber into small erasers which they sold to artists and scientists interested in wiping pencil marks from paper.[32] Others sliced rubber bottles into long threads and inserted them in suspenders, glove wrists, and other garments that required a tight fit.[33] In England, a tinkerer named Thomas Hancock built a machine that shredded rubber and used mechanical pressure to immediately recompose it into homogeneous blocks and sheets.[34] He sold the sheets to machinists who used them to cover the surface of rollers and wheels, and also to carpenters who used them as cushioning in billiard tables.[35] In France, inventors dissolved shredded rubber in solvent and used the viscous mixture to coat and seal the fabric of hot air balloons and other inflatable devices.[36] In Scotland, Charles Macintosh sandwiched the rubber paste between two pieces of cloth to manufacture his eponymous raincoats.[37]

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29 D. Hamilton Hurd, *History of Essex County, Massachusetts, with Biographical Sketches of Many of its Pioneers and Prominent Men, Vol. 1.* (Philadelphia, Penn., 1888), 88.

30 *Ibid., 88*

31 Until 1808, only Portuguese ships could dock in Brazilian ports, so all Brazilian rubber was imported through Portugal.

32 Joseph Priestley, *A Familiar Introduction to the Theory and Practice of Perspective* (London, 1770), xxiii.

33 Goodyear, *Gum-Elastic and its Varieties,* 52; Hancock, *Personal Narrative*, 3.

34 John Loadman and Francis James, *The Hancocks of Marlborough: Rubber, Art, and the Industrial Revolution: A Family of Inventive Genius* (New York, 2010), 22-24

35 *Ibid.,* 24

36 Loadman and James, *The Hancocks of Marlborough*, 19

37 *Ibid.,* 50

Following their European predecessors, American traders decided to import bottles and blocks of crude rubber to be processed at home. American inventors soon discovered they could use turpentine to dissolve shredded rubber, and that this mixture, sometimes enhanced with lampblack, could rubberize cloth when spread over it. In 1833, a small group of investors founded the Roxbury India Rubber Company (RIRC) to manufacture rubberized goods such as carriage covers, overcoats, hats, and shoes. Other rubber-based companies soon followed in New York, New Haven, Boston, and other cities in the northeast of the US.[38] At first, these firms seemed poised for great success, and a high-level endorsement by Andrew Jackson, then President of the United States, gave them an extra boost. In 1834, Jackson visited New England, and 'while in Boston was presented with a suit of clothes of this new manufacture, in which dress, on a day somewhat wet, he appeared in public on horseback, for the purpose of reviewing the troops on the Boston Common.' [39] The public took notice, and RIRC's stock immediately 'rose from one hundred to five or six hundred dollars a share'. Investors believed they were about to make a fortune.

In retrospect, it was nothing but a bubble. When summer came and temperatures rose, rubberized garments made in the US melted, stuck to each other, and released a foul smell. Customers were furious, demand plummeted, and manufacturers went bankrupt. As described by a contemporary observer, 'the warm weather literally melted the hopes and expectations of the incautious adventurer. A panic was the consequence, mills were abandoned, thousands of

[38] Nancy P. Norton, "Industrial Pioneer: the Goodyear Metallic Rubber Shoe Company," (PhD Diss., Radcliffe College, 1950), 10.

[39] Nathaniel Hayward, *Some Account of Nathaniel Hayward's Experiments with India Rubber: Which Resulted in Discovering the Invaluable Compound of that Article with Sulphur* (Norwich, Conn., 1865), 3.

artisans were suddenly thrown out of employment, and this vast field of enterprise so promising but a few months before, was swept as by a hurricane.'[40]

American entrepreneurs did not know it at the time, but rubber is made of extremely long molecules known as polymers. It is the entanglement and interaction among these polymers that give the material its elasticity, wear-resistance, melting point, and strength. While no archaeologist has tested 19th century rubber production techniques in a lab, organic chemistry suggests that the turpentine method broke and disentangled the polymer chains to such an extent that the resulting paste could hardly be called rubber anymore. As summarized in 1865 by a writer for '*The North American Review'*, 'no one had discovered any process by which India-rubber once dissolved could be restored to its original consistency.'[41]

3 – NATIVE RUBBER PRODUCTION IN BRAZIL

Brazilian producers did not face the same constraint of dissolving, forming, and then hardening crude rubber that frustrated their American counterparts because they obtained latex, the raw material for rubber, in liquid form directly from the rubber tree. A number of plants produce latex, but the most prominent is *Hevea brasiliensis*, a tree native to the Amazon.[42] Its latex is a white, viscous, milk-like emulsion that can be harvested through a shallow incision of the tree's trunk. Critically, the *Hevea* latex coagulates into a brittle, low quality substance a few hours after being collected. To create high quality rubber, the latex must be processed near the collection

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40 William H. Richardson, *The Boot and Shoe Manufacturers' Assistant and Guide. Containing a Brief History of the Trade. History of India-Rubber and Gutta-Percha, and Their Application to the Manufacture of Boots and Shoes. Full Instructions in the Art, with Diagrams and Scales, etc., etc. Vulcanization and Sulphurization, English and American Patents. With an Elaborate Treatise on Tanning* (Boston, Mass., 1858), 113-114.

41 The North American Review vol 101 (Boston 1865):68

42 Dean, *Brazil and the Struggle for Rubber*, 4.

site and at once. The process itself was quite straightforward. First, the rubber producer dipped a mould into the latex to coat it with the material, or spread the latex atop a piece of cloth; next, he exposed the assemblage to a plume of smoke for the latex to dry; and finally, he repeated the process until the product had acquired the desired thickness and shape.

It is not entirely clear at the molecular level what this process achieved. According to numerous accounts, experienced rubber producers insisted on using the seeds of a particular family of palm trees as fuel,[43] and insisted also on channelling the fumes through a tailor-made clay chimney to make it both thick and pungent. One hypothesis is that the fumes not only dried the latex but also embedded it with soot for colour and increased physical resistance. Another hypothesis is that the smoke killed the bacteria that degrade the latex. A final hypothesis is that the fumes contained enough sulphur to chemically bind the rubber polymers together and stabilize the material. In any case, the available evidence suggests that rubber goods made with fresh latex in the Amazon were of relatively high quality. There are no records of customer complaints, and many decades later, pioneers of the American rubber industry still recalled Amazonian rubber goods fondly for their 'comfort, waterproof qualities, lasting qualities', and praised the 'rubber man in the forest' for being 'quite an expert at his business'.[44]

Inhabitants of the Amazon relied on their access to fresh latex to produce a wide range of products, including waterproof ponchos for patrolmen in Belém, rubberized army boots and knapsacks for soldiers in Portugal, and hollow pears to squirt water known as syringes, which

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[43] Herndon and Gibbon, *Exploration of the Valley of the Amazon*, 330-331; William H. Edwards, *A Voyage up the River Amazon including a Residence at Para* (London, 1867), 179-80; Bates, *The Naturalist on the River Amazon*, 74; Franz Keller, *The Amazon and Madeira Rivers: Sketches and Descriptions from the Note-Book of an Explorer* (Philadelphia, Penn., 1875), 118-119.

[44] "Those Old Fashioned Gum Shoes," *India Rubber World* 4, no. 3 (June 15, 1891): 54.

were used by Portuguese doctors to administer medicine. [45] These goods had such a positive reputation that even Don Jose I, King of Portugal [1750-1777] requested that his boots be covered with gum elastic.[46] Forest dwellers also made rubber goods for themselves, including containers, buckets, and other vessels to carry and preserve beverages and fruits.[47] On occasion, they manufactured rubber shoes to protect their feet.[48]

The Birth of the Amazonian Rubber Shoe Industry

In 1824, Benjamin Upton, a former privateer in the US Revolutionary War turned commercial sea captain,[49] visited Belém to buy hides for tanneries and cobbler shops in New England. On his return to Salem, he brought back a pair of rubber shoes.[50] Somehow, this pair ended up in the hands of Thomas Crane Wales, a young man from Stoughton, Massachusetts, who had just opened a retail shoe business in Boston. Wales placed the Amazonian rubber shoes in his store window, 'where they were inspected by passers-by as a great curiosity.'[51] Sensing an opportunity, Wales asked Upton to bring another 500 pairs, which sold promptly. This initial success convinced both men that 'there was money to be made' in this trade.[52] Instead of

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[45] Susanna B Hecht, "Factories, Forests, Fields and Family: Gender and Neoliberalism in Extractive Reserves," Journal of Agrarian Change 7, no. 3 (2007): 316-347; Charles Mann, *1493: Uncovering the New World Columbus Created* (New York 2012); see also Spix, J. B. v. and C. F. P. v. Martius *Viagem pelo Brasil*, v. 1 (1817 - 1820). Sao Paulo, Melhoramentos, 2a ed. p.30; Dean, *Brazil and the Struggle for Rubber*, 9.; Cruz, *Historia da Associação Comercial do Para*, 96.

[46] Cruz, *Historia da Associação Comercial do Para*, 95.

[47] *Ibid 94*.

[48] One can still find crude rubber shoes in some parts of the Amazon, where they are known as *sapatos de seringueiro*, or 'rubber tapper's shoes'.

[49] John Adams Vinton, *The Upton Memorial: A Genealogical Record of the Descendants of John Upton* (Bath, Maine, 1874).

[50] Samuel Eliot Morison, *The Maritime History of Massachusetts 1783-1860* (Boston, Mass., 1921), 222; Hurd, *History of Essex County*, 6-7.

[51] Henry Fritz-Gilbert Waters, *The New England Historical and Genealogical Register: Volume 36* (Berwyn Heights, Md., 1882), 208; see also *The National Cyclopaedia of American Biography, Vol. 10 (1909)*, 406.

[52] Harry G. Johnson, "The Early American Trade in Pará Rubber," *India Rubber World* 9, no. 2 (1893): 41

importing crude rubber like so many other American and European merchants, they would import the rubber shoes.

It seemed like a promising idea, but turning this perceived opportunity into a thriving business would not be easy. Internationally, Brazil was bound by a series of treaties that guaranteed that foreign goods could enter Brazil at low tariffs, but did not ensure reciprocity.[53] As a result, Brazilian goods paid high tariffs when imported into the US or Europe.[54] Domestically, Brazil as a whole lacked commercially navigable rivers and had not invested in canals, improved waterways, railway lines, or even an extensive road network, so transportation was expensive.[55] In addition, the country did not have well-developed capital markets to convert private savings into investment.[56] Labor was notably scarce.[57] And finally, even though Brazil had attained political independence in 1822, local elites did not agree on an overarching institutional architecture for the country until the 1840s.[58] In the interim, ongoing disputes concerning the autonomy of provinces vis-à-vis the central state merged with grievances held by other groups to fuel armed rebellions throughout the territory. The central government suppressed all revolts, but these military campaigns forced the central government to raise

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53 Leslie Bethell and José Murilo de Carvalho, "Brazil from Independence to the Middle of the Nineteenth Century," in *The Cambridge History of Latin America, Volume 3: from Independence to c.1870*, ed. Leslie Bethell (Cambridge, 1985), 689-90.

54 Rory Miller, *Britain and Latin America in the Nineteenth and Twentieth Centuries* (New York, N.Y., 1993); Stephen H. Haber and Herbert S. Klein, "The Economic Consequences of Brazilian Independence," in *How Latin America Fell Behind: Essays on the Economic Histories of Brazil and Mexico, 1800-1914*, ed. Stephen H. Haber (Stanford, Calif., 1997), 243-259.

55 William Summerhill, "Transport Improvements and Economic Growth in Brazil and Mexico," in *How Latin America Fell Behind: Essays on the Economic Histories of Brazil and Mexico, 1800-1914*, ed. Stephen H. Haber (Stanford, Calif., 1997), 93-117.

56 Stephen H. Haber, "Financial Markets and Industrial Development: A Comparative Study of Governmental Regulation, Financial Innovation, and Industrial Structure in Brazil and Mexico, 1840-1930," in *How Latin America Fell Behind: Essays on the Economic Histories of Brazil and Mexico, 1800-1914*, ed. Stephen H. Haber (Stanford, Calif., 1997), 146-179.

57 Emília Viotti da Costa, *The Brazilian Empire: Myths and Histories* (London, 2000).

58 Roderick J. Barman, *Brazil: the Forging of a Nation, 1798-1852* (Stanford, Calif., 1988).

money abroad and mint copper currency, triggering both inflation and counterfeiting.[59] In the end, output in 19th century Brazil kept pace with population growth, but real income per capita did not grow.[60]

In the Amazon, economic conditions were arguably worse. Prior to 1860, the region was an isolated outpost of the Brazilian empire. Local landowners had achieved some prosperity during the 18th century thanks to growing European demand for cacao,[61] but from 1800 to 1830, per capita income had fallen by 45%.[62] Riverine transport was enormously expensive. Until 1866-7, foreign vessels were not allowed to enter the Amazon,[63] and only in 1864 did Brazilian investors establish a local steamship line.[64] For most of the 19th century, cargo and passengers moved around exclusively in wooden vessels with relatively small sails.[65] The wind and tides thus dictated the patterns of travel, and every so often crews had to paddle their way forward. Capital was scarce.[66] But the biggest difficulty afflicting the Amazonian economy was the shortage of labor.[67] Slaves were expensive, and many captives took advantage of the enormous and sparsely populated territory to escape into the forest where they joined independent

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59 Nathaniel H. Leff, "Economic Development in Brazil, 1822-1913," in *How Latin America Fell Behind: Essays on the Economic History of Brazil and Mexico, 1800-1914*, ed. Stephen H. Haber (Stanford, Calif., 1997), 43.

60 *Ibid.*, 34

61 Dauril Alden, "The significance of Cacao Production in the Amazon Region During the Late Colonial Period: An Essay in Comparative Economic History," *Proceedings of the American Philosophical Association* 120, no. 2 (1976): 103-135.

62 Roberto Santos, *História Econômica da Amazônia (1800-1920)* (São Paulo, 1980), 26.

63 Paulo Palm, *A Abertura do Rio Amazonas à Navegação Internacional e o Parlamento Brasileiro* (Ministerio das Relacoes Exteriores & Fundacao Alexandre de Gusmao, 2009)

64 Vitor Marcos Gregório, "O Progresso a Vapor: Navegação e Desenvolvimento na Amazônia do Século XIX," *Nova Economia* 19, no. 1 (2009): 185-212.

65 Herndon and Gibbon, *Exploration of the Valley of the Amazon*, 263.

66 Rosa Elizabeth Acevedo Marin, "Espaco para a atividade fabril na recuperacao pos-Cabanagem," *Anais do Encontro Nacional de Economia* v.4 (1988): 248

67 Emília Viotti da Costa, *The Brazilian Empire: Myths and Histories* (London, 2000).

communities known as *Mocambos* or *Quilombos*.[68] Similarly, indigenous people often preferred to engage in subsistence activities rather than sell their labor in the marketplace. As described by Henry Walter Bates, an English naturalist who visited the region in 1848, 'the people of these parts seemed to be above working for wages.'[69]

Extreme political instability exacerbated the problems. In 1836, an intra-elite dispute devolved into the *Cabanagem,* the largest peasant rebellion and arguably the bloodiest uprising in Brazilian history.[70] During the hostilities, rebels captured Belém twice and asserted control over the entire government of the province.[71] The revolt ended in 1840, but by then the fighting had 'destroyed most farms and mills, scattered or murdered slaves, and devoured livestock and even seed reserves.'[72] Labor was scarcer than ever, 'throughout the province one sense[d] the population shortage, people of all classes being absent.'[73]

These underlying features of the Amazonian economy had a profound effect on the manner in which rubber products could be produced and traded. The *Hevea* tree grows in relative low densities in most of the Amazon basin.[74] During the early 19th century, the trees were particularly accessible in a region of countless fluvial channels and islands that connect

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[68] Flavio dos Santos Gomes, "A Safe Haven: Runaway slaves, Mocambos and Borders in Colonial Amazonia, Brazil," Hispanic American Historical Review 82, no. 3 (2002): 469-498; Oscar de la Torre Cueva, "Freedom in Amazonia: The Black Peasantry of Pará, Brazil, 1850-1950" (PhD Diss., University of Pittsburg, 2011).

[69] Bates, *The Naturalist on the River Amazons*, 61

[70] Cleary, 'Lost Altogether to the Civilized World'

[71] Mark Harris, *Rebellion on the Amazon: The Cabanagem, Race, and Popular Culture in the North of Brazil, 1798-1840* (Cambridge, 2010).

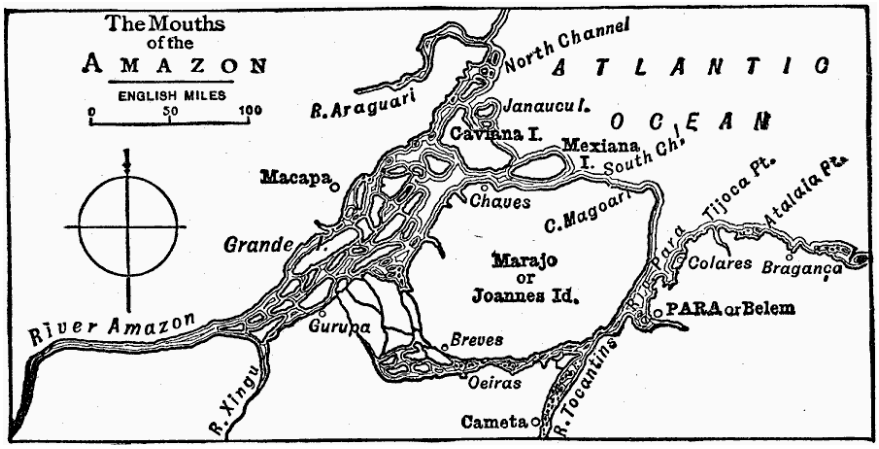
[72] Discurso com que o Presidente da Provincia do Pará fez a Abertura da 1a sessão da Assemblea Provincial no dia 2 de março de 1838.

[73] *Ibid.*

[74] Dean, *Brazil and the Struggle for Rubber*, 2-3.

Belém to the estuaries of the Tocantins and Xingu rivers, at the mouth of Amazon (see map 1 below).[75]

Map 1 – The Lower Amazon



Source: http://etc.usf.edu/maps/pages/2700/2776/2776.htm

This area accommodated a diverse population and various modes of production.[76] On the banks of bigger channels, Brazilian-born landowners maintained estates where African slaves and other workers raised cattle and cultivated sugarcane, cacao, coffee or cassava. Some of them processed the sugarcane into sugar or cachaça, and the cassava into flour. A few landowners had retained native *Hevea* trees to provide shade for their crops so they produced rubber as well.[77] Large swaths of the territory, however, were occupied by acculturated Amerindians and individuals of African or mixed descent known as *caboclos* who constituted the Amazonian peasantry.[78] Some *caboclos* lived in local towns such as Gurupá, Cametá, and

[75] Alfred Russel Wallace, *A Narrative of Travels on the Amazon and Rio Negro, With an Account of the Native Tribes, and Observations on the Climate, Geology, and Natural History of the Amazon Valley* (London, 1853), 437; Bates, *The Naturalist on the River Amazon*, 73; Herndon and Gibbon, *Exploration of the Valley of the Amazon*, 329.

[76] Susanna B Hecht, *The Scramble for the Amazon and the "Lost Paradise" of Euclides da Cunha* (Chicago, 2013); Charles Mann, *1493: Uncovering the New World Columbus Created* (New York 2012), 149.

[77] Wallace, *A Narrative of Travels on the Amazon*, 60-77; Edwards, *A Voyage up the River Amazon*, 81.

[78] Stephen Nugent, *Amazonian Caboclo Society: An Essay on Invisibility and Peasant Economy* (Oxford, 1993); Stephen Nugent, "Whither O Campesinato? Historical peasantries of Brazilian Amazonia," *The Journal of Peasant Studies* 29, 3-4 (2002): 162-189; Barbara Weinstein, "Persistence of Caboclo Culture in the Amazon: The

Breves; others lived in smaller settlements or isolated huts spread throughout the region. In contrast to the arrangement that prevailed during the rubber boom (1860-1912), when most men worked alone in the forest and devoted themselves almost exclusively to producing rubber, most *caboclos* lived with their families,[79] moved around depending on the seasons, and engaged in a variety of subsistence and market-oriented activities.[80] Depending on the circumstances, they cultivated cotton and rice, collected coffee and cocoa, hunted small animals, or caught *pirarucú* and other fresh water fish. If they wanted cash or consumer goods, they sought employment in one of the passing canoes or harvested forest products and engaged in trade.[81]

Rubber was built into their lives, and Charles Goodyear described the production process as an all-day affair: 'the men start out at daylight to tap their trees, each taking a ball of kneaded clay in his hand for making any cups that may be wanted [to collect the latex], and having made their circuit in three or four hours, return to the house for breakfast. Soon after noon, they make the round again, to collect the milk in gourds, slung in thongs of bark, and hung over the shoulder. […] On reaching the house, the milk is manufactured at once into shoes, bottles, or sheets, as it soon hardens.'[82] Goodyear further explained that 'one man collects milk for six to ten pairs per day. The dipping of a pair of shoes occupies about fifteen minutes, and the figuring, the same or less.'

impact of the rubber trade, 1850-1920" Eugene Parker (ed) The Amazon Caboclo: Historical and Contemporary Perspectives (Williamsburg, VA, 1985): 89-113; Cueva, *Freedom In Amazonia*.

79 Joao Pacheco de Oliveira Filho, O Caboclo e o Bravo: Notas sobre duas modalidades de forca de trabalho na expansao da fronteira Amazonica no Seculo XIX, In: Silveira, E. (ed.). *Encontros com a civilização brasileira* (Rio de Janeiro, 1979), 101-140.

80 Susanna B Hecht, "Factories, Forests, Fields and Family: Gender and Neoliberalism in Extractive Reserves," *Journal of Agrarian Change* 7, no. 3 (2007): 316-347.

81 Bates, *The Naturalist on the River Amazon*, 28-35; Wallace, *A Narrative of Travels on the Amazon*, 67-68.

82 Goodyear, *Gum-Elastic and its Varieties*. 49-50.

Commercial practices in this region differed from the more remote areas of the Amazon. Upriver, indigenous people insisted on being paid with merchandise in advance and promised to deliver forest products several months later. Naturally, they did not offer collateral so the traders shouldered all the risk. Downriver where most of the rubber was produced, *caboclo*s sometimes asked to be paid with merchandise in advance, but on many occasions they sold their rubber for cash or bartered their output in transactions that cleared right away.[83] Rubber shoes were not expensive. In 1846, a *caboclo* told the American entomologist William Henry Edwards that he sold rubber shoes for ten or twelve *vinténs*[84] [i.e. 200 to 240 reis][85], or approximately ten to fifteen cents (USD) each pair.[86] Other sources corroborate this value and that transactions were often conducted in cash.[87]

In turn, buyers sold the rubber shoes in Belém for a hefty profit, perhaps as high as 100%.[88] These margins, however, were offset by low unitary prices, small output per worker, and decentralized and seasonal production. If traders wanted to generate a large surplus, they needed volume, and to have volume they needed to recruit a cadre of intermediaries and river traders who bought rubber from an even larger number of *caboclos*.

These features of the forest economy created a clear division of labor. The richer merchants lived in Belém with their families and lent money or merchandise to river traders who ventured into the countryside to buy rubber from *caboclos* on their behalf. Some had no

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[83] Herndon and Gibbon, *Exploration of the Valley of the Amazon*, 353.

[84] William H. Edwards, *A Voyage up the River Amazon including a Residence at Para* (London, 1867), 221.

[85] Alfred Russel Wallace, *A Narrative of Travels on the Amazon and Rio Negro, With an Account of the Native Tribes, and Observations on the Climate, Geology, and Natural History of the Amazon Valley* (London, 1853), 20.

[86] Herndon and Gibbon, *Exploration of the Valley of the Amazon*, 310. They report that one dollar corresponded to two thousand reis.

[87] Carlos Augusto Bastos, "Deserções e contexto econômico no Grão-Pará (c. 1840-1860)", Simposio de Pos-Graduacao em Historia Economica (2008): 16; Goodyear, *Gum-Elastic and its Varieties*, 50; Ernesto Cruz, *Historia da Associação Comercial do Pará*, 96.

[88] Wallace, *A Narrative of Travels on the Amazon*, 254.

fixed lodging and operated from itinerant trading boats known as *regatões*.[89] Others established small stores in the forest, often being little more than a thatched hut on stilts. Henry Walter Bates described one of these outposts, located in a "wild and secluded-looking spot" somewhere between Gurupá and Breves: "the house was built of light poles, and on piles to keep it out of the water, which at this time, flowed under and around it". Despite its apparent crudeness, this shop stocked "all the necessaries of life, and such articles of luxury as were likely to attract the fancy of the Indian gatherers of the rubber."[90]

A final hurdle for the establishment of a large scale Amazonian rubber shoe trade concerned product quality. Naturally, *caboclos* and other forest dwellers had no familiarity with the tastes and requirements of American and European buyers. Typically, they used clay lasts to produce rubber products so their shoes were rough and ill-formed. To increase their output, some adulterated the *Hevea* latex with the sap of lesser trees, or added sand or mud to the material.[91] Sometimes they packed the shoes too tightly or without the proper care. On one occasion, Thomas C. Wales and his one-time partner, Benjamin Harris, bought a cargo of shoes from Benjamin Upton and found them 'to be so pressed and out of shape that Mssrs. Harris and Wales believed they might in equity repudiate the contract.'[92] In the end, Wales and Harris tried to fix the shoes and sell them, but the net operation caused them such a financial loss that Harris quit the business.

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89 Edwards, *A Voyage up the River Amazon*, 36; David McGrath, "Parceiros no Crime: O Regatão a e Resistência Cabocla na Amazônia Tradicional," *Novos Cadernos NAEA* 2, no. 2 (1999): 57-72; Márcio Couto Henrique and laura Trindade de Morais, "Estradas Líquidas, Comércio Sólido: Índios e Regatões na Amazônia (Século XIX)," Revista Historia (São Paulo) 171 (2014): 49-82

90 Bates, *The Naturalist on the River Amazons*, 330

91 Herndon and Gibbon, *Exploration of the Valley of the Amazon*, 331.

92 J.D. Van Slyck, *New England Manufacturers and Manufactories: Three Hundred and Fifty of the Leading Manufacturers of New England* v.2 (Boston, Mass., 1879), 626-632.

To thrive in this environment of decentralized craft production, unsecured credit, long chains of intermediation, lax quality standards, and high transportation costs, aspiring rubber goods magnates needed to acquire detailed knowledge about local habits and customs, establish good relationships with river traders and rubber producers, and retain access to a large pool of capital to tie everything together. These are not trivial challenges, but American retailers such as Thomas C. Wales and merchants such as Benjamin Upton had learned how to overcome many of these obstacles as part of their existing business practices.

4 – AMERICAN MERCHANTS SET UP A RUBBER SHOE INDUSTRY IN BRAZIL

In the early 19th century, the production of leather shoes and boots was one of the pillars of the New England economy. Like its Amazonian counterpart, this craft industry was entirely artisanal, decentralized, and reliant on putting-out, or payment for production.[93] Retailers and "bosses" such as Thomas C. Wales bought leather from local tanneries and handed them over to master artisans who worked in central shops or in ten-footers attached to their houses. In turn, master artisans subcontracted family members, journeymen, and apprentices who assembled the shoes, sometimes in different towns. These subcontracting networks could cover enormous terrain. Once a batch of shoes was ready, the master artisan brought them back to the boss, who inspected the shoes for quality and packed them for shipment. Instead of a fixed salary in cash, most bosses paid workers for production with either merchandise or 'orders' that could be redeemed at a local grocery store, often owned by the same manufacturer or retailer.[94] In brief,

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93 Blanche E. Hazard, *The Organization of the Boot and Shoe Industry in Massachusetts Before 1875* (Cambridge, Mass., 1921), Alan Dawley, *Class and Community: The industrial revolution in Lynn* (Cambridge, Mass., 1976)

94 David Newhall Johnson, *Sketches of Lynn, Or, The Changes of Fifty Years* (Lynn, Mass., 1880), 90; Fred A. Gannon, *A Short History of American Shoemaking* (Salem, Mass., 1912), 17.

for American shoe retailers, decentralized craft production was not an exotic challenge, it was business as usual.

Complementing retailers' familiarity with decentralized craft production, merchants such as Benjamin Upton had access to relatively large pools of capital to finance the operation, and also extensive experience buying and selling merchandise abroad. To decrease the risk that distant agents would not comply with instructions or somehow betray their principals, merchants organized their firms along family lines. The patriarchs owned the capital and made major business decisions while younger family members rose through the ranks as sailors, captains, or business agents. In some cases, agents operated from the ship, spending a few days or weeks at each port of call. In other cases, they established permanent residence at a given port. Men such as Thomas C. Wales and Benjamin Upton drew on this experience to build an appropriate structure for acquiring rubber shoes in the Amazon. For instance, Benjamin Upton sent his son, also named Benjamin, to live in Brazil. By 1839, the younger Upton had acquired an abandoned farm at the margins of the Maguary River, approximately twelve miles from Belém.[95] To help him run the operation, he hired an American (or possibly Canadian) millwright named Mr. Leavens and a few other men.[96] Together, they bought forest products from the *caboclos*, and also rice and timber, which they processed in two water- and one steam-powered mills.

In addition to sending younger partners or agents to Brazil, many of the senior merchants who traded with South America had also lived in the region earlier in their careers, spoke Portuguese (or at least Spanish), and remained familiar with local customs and politics.[97]

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[95] Bates, *The Naturalist on the River Amazon*, 28-35; Wallace, *A Narrative of Travels on the Amazon*, 23-45.

[96] Wallace, *A Narrative of Travels on the Amazon and Rio Negro*, 27, 45.

[97] J. H. Galey, "Salem's Trade with Brazil, 1801-1870," *Essex Institute Historical Collections* 107, no. 2 (1971): 198-219.

For example, John Bertram, one of the richest men in Salem and a prominent importer of Amazonian rubber shoes,[98] had spent part of his youth in Buenos Aires. [99] And in 1839-1840 he visited Belém to inspect operations on the ground.

Finally, American traders and retailers took advantage of their proximity to the American leather footwear industry to ensure that Amazonian shoes would meet their customers' expectations. First, they acquired well-shaped wooden lasts likely made in Lynn, Massachusetts and sent them to rubber producers in Brazil so the shoes would be well-formed and match existing sizes and styles.[100] And second, retailers relied on their access to master artisans and journeymen to engage in post-production, i.e. after a cargo of Amazonian rubber shoes had arrived in the US, retailers cleaned the products, trimmed their edges, applied black varnish, and re-stretched them. Some importers aged the shoes in storage so the rubber would be fully cured before the product was sold. Others lined them with cotton-flannel and equipped them with leather insoles to improve comfort.[101]

Thanks to their first-hand experience, know-how, resources and initiative, American merchants and retailers bolstered the Amazonian rubber shoe industry and helped it thrive. From 1830 onwards, sales soared and each transaction generated enormous gross gains. While river traders paid *caboclos* $0.10 to $0.20 for a pair of shoes,[102] retailers such as Wales sold them in Boston for $3.00 to $5.00 each.[103] These margins were so high and the number of

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98 Paine, *The Ships and Sailors of Old Salem*

99 John Bertram of Salem, Massachusetts; [his own account of incidents in his life]

100 Morison, *The Maritime History of Massachusetts*, 222.

101 Goodyear, *Gum-Elastic and its Varieties*, 53; Hancock, *Personal Narrative*, 74.

102 See footnotes 77-80; see also Herndon and Gibbon, *Exploration of the Valley of the Amazon*, 353, who reported that, in the early 1850s, traders in Belém exported an annual average of 192,000 pairs of rubber shoes for $38,400, or $0.20 each. This value is compatible with a 100% gross margin from *caboclo* to trader in Belém.

103 Norton, *Industrial Pioneer*; The North American Review vol. 101 (Boston 1865):69

merchants so low that a commentator compared the business to a 'regular and well organized monopoly'.[104] Naturally, this monopoly had no real barriers to entry so insiders tried to protect it through secrecy. As explained by an American who had lived in Belém for many years, American merchants refused 'even to take a letter from here to Para,[105] unless they [could] first see the contents of it; such is their fear that the prices current should reach that place.' [106]

Retail prices for Amazonian shoes in the US were clearly high, the equivalent of five pairs of leather shoes, or five to ten days of work for a laborer in the shipbuilding industry,[107] but not unfair to the consumer. As asserted by a contemporary observer, 'by buying a pair one got one's money worth.'[108] Another observer provided even higher praise: 'for quality of material and for durability that shoe will probably never be excelled.'[109] The main clients were not sailors or fishermen who used the Amazonian shoes at sea, but women who likely valued style along with functionality.[110] To please this more discerning clientele, some pairs were plain, but others were decorated with lines, flowers, or 'tiny prickings' imprinted 'in great profusion and with considerable taste.'[111] In 1850, prospects seemed so positive that John Bertram and his partner James Barr Curwen '…established in Para a factory for the manufacture of rubber shoes. Lasts were taken out and a fine shoe was placed upon the market ... the shoes sold readily all over the world.'[112]

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104 Henry L Norris and J.T. Armstrong, "Extract from the Report of the Committee on India Rubber Goods, 41

105 In the 19th century, foreigners often referred to Belém, the capital of the province of Grão-Pará, simply as "Para".

106 Henry L Norris and J.T. Armstrong, "Extract from the Report of the Committee on India Rubber Goods, 41

107 Margaret S. Dart, *Yankee Traders at Sea and Ashore; an Account of the Early Nineteenth Century Merchant Ships Built in Connecticut and Sailing from New York, and of Connecticut Travelers to the Far West and the Far East.* (New York, NY, 1964).

108 "Those Old Fashioned Gum Shoes," *India Rubber World*

109 "The Perfect Rubber Shoe," *India Rubber World* 6 (May 15, 1892), 225.

110 Catalog of India rubber shoes, Peabody Essex Museum, Phillips Library, MH 0.250; MH 0.251; MH 0.297

111 "Old Time New York Rubber Trade," *India Rubber World* 4, no. 3 (June 15, 1891).

112 Johnson, "The Early American Trade in Pará Rubber,"

5 – VULCANIZATION AND THE DECLINE OF THE AMAZONIAN RUBBER SHOE INDUSTRY

In the US, a few inventors and entrepreneurs, unfazed by the failure of RIRC and other pioneering rubber factories, continued to search for ways to reshape crude rubber into useful products. In 1832 Nathaniel Hayward obtained a US patent for a mixture of rubber and sulphur.[113] In 1839 Charles Goodyear bought this patent and, after some additional tinkering, discovered that exposure to high heat rendered the rubber-sulphur mixture both elastic and durable.[114] It was a major breakthrough, and the process was later termed vulcanization. At the molecular level, vulcanization creates cross-links that connect polymer chains into a stable molecular network. As an added bonus, this process allows manufacturers to vary the proportion of sulphur and the exposure to heat to produce rubber with varying characteristics for different applications. Vulcanization is a versatile process that remains in use to this day.

Goodyear and his associates spent another fifteen years perfecting vulcanization and resolving intellectual property disputes.[115] During this period, dealers and clients continued to dismiss American-made rubber shoes for looking 'so fragile when compared with the bulky shoes of pure gum that had come from Para.'[116] Even Charles Goodyear remained skeptical of his invention's prospects. Writing in 1853, he predicted that 'the export of India rubber from Para in the form of shoes will no doubt continue for a long time to come. For it always happens that when articles of great utility once obtain in the market, a great time must elapse before

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113 US Patent 1090 A, "Improvement in the mode of preparing *caoutchouc* with sulphur for the manufacture of various articles", Feb 24 1839

114 Charles Slack, "Noble Obsession: Charles Goodyear, Thomas Hancock, and the Race to Unlock the Greatest Industrial Secret of the 19th Century" (New York, 2002)

115 Henry C. Pearson, "The India-Rubber Industry in New England," in *The New England States, Their Constitutional, Judicial, Educational, Commercial, Professional and Industrial History*, ed. William T. Davis (Boston, Mass., 1897), 342.

116 "How the first rubber shoes found a market," *India Rubber World* 3, no. 1 (October 18, 1890): 18

their consumption ceases, however great the subsequent improvements in these articles, or their substitutes may be.'[117]

Goodyear proved too pessimistic. Once American industrialists had perfected vulcanization, they quickly went on to produce shoes that were so superior and so much cheaper than their Amazonian counterparts that their commercial success was practically assured. In 1852, seven of the largest American rubber manufacturers agreed to set a floor of $0.75 for ladies' and $1.00 for men's shoes, a third to a fifth of the price of Amazonian shoes.[118] Low prices led to high volumes. In that year, one of these firms produced 274,000 pairs of rubber shoes, and the next year it increased production to 429,401 pairs.[119]

It seems evident that the advent of vulcanization doomed the Amazonian shoe industry, but it is not clear why the incumbent collapsed so quickly and disappeared so thoroughly. After all, until 1912 the Amazon retained a near-monopoly over *Hevea* production, and the *caboclos* who produced rubber shoes, the traders who connected them to international markets, and the retailers who had invested so much money and effort into building this profitable trade could have fought back to delay or even prevent the demise. Similarly, provincial authorities in Brazil could have stepped in to support the Amazonian rubber shoe industry in lieu of or alongside the production of crude rubber. The fact that none of these agents tried to protect the incumbents against vulcanization, or tried and failed so miserably, merits further examination.

Understanding the Brazilian non-response

In the Amazon, provincial authorities viewed rubber tapping with ambivalence. On the one hand, they recognized that the rubber trade was a growing sector, and the taxes it paid would

[117] Goodyear, *Gum-Elastic and its Varieties*, 45.
[118] "Prices and Lines for 1852," *India Rubber World* 10 (June 15, 1894): 82
[119] Norton, *Industrial Pioneer*, 522

soon provide the government with its 'most important and abundant source of revenue.'[120] On the other hand, government officials feared that rubber tapping could fuel social unrest. During the *Cabanagem,* a large number of rebels had been rubber tappers and the fiercest battles had occurred in places where rubber trees were most abundant.[121] Not surprisingly, many authorities saw the production of rubber as a pathway for 'felons, fugitives, deserters, runaway slaves, and other individuals' [122] to 'live independently and break the law at will.'[123]

Politically influential landowners tended to be even less tolerant towards rubber production than provincial authorities. At best, they had no stakes in this industry. They did not own land with large numbers of *Hevea* trees, and they had no control over the *caboclo* labor force, so they ignored the activity. At worst, they resented that many of their slaves and workers abandoned their posts to live in the forest, so they treated rubber production with contempt.

Under these circumstances, local authorities adopted numerous policies that undermined rubber production and diverted resources to other activities. For instance, in 1839, the president of the province enacted a law conscripting 'natives, free blacks, and those of mixed blood', together with 'any men without property or gainful employment' into the "*Corpo de Trabalhadores*", a labor gang managed by the military.[124] In 1848 this organization had 7,385

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[120] Relatorio apresentado a Assemblea Legislativa Provincial por S. Exca. O Sr. Vice-Almirante e Conselheiro de Guerra Joaquim Raymundo de Lamare, presidente da provincia, em 15 de agosto de 1867, 12-13.

[121] Harris, *Rebellion on the Amazon*; Robin Anderson, "The caboclo as revolutionary: The cabanagem revolt of 1835-1836," Eugene Parker (ed) The Amazon Caboclo: Historical and Contemporary Perspectives (Williamsburg, VA, 1985): 51-88

[122] Discurso recitado pelo Exmo. Sr. Doutor João Maria de Moraes,Vice Prezidente da Provincia do Para, na abertura da primeira sessão da Quinta Legislatura da Assembleia Provincial, no dia 15 de Agosto de 1846, 4-5.

[123] For a thorough discussion on elite objection to the rubber trade and rubber tappers, see Barbara Weinstein, *The Amazon Rubber Boom*

[124] Patrícia Raiol Castro de Melo Lopes, "Os Corpos de Trabalhadores na Província do Grão-Pará: Outros Significados para uma Política de Arregimentação da Mão de Obra (1835-1840)" (PhD diss., Universidade Federal do Pará, 2012).

men under its authority.[125] At that time, the entire province had approximately 127,000 people,[126] excluding slaves. If a third were adult men, this policy reduced the labor pool available to produce rubber by more than 15%.

The provincial government also strived to control inland travel and trade. In a lament that would ring true to those trying to do business in Brazil today, Alfred Russell Wallace marvelled at the number of permits he had to obtain before travelling from Belém to Troquera, in the upper Tocantins: "… the forms to be filled up, the signing and countersigning at different offices, the applications to be made and formalities to be observed, are so numerous and complicated, that it is quite impossible for a stranger to go through them".[127] In fact, Wallace confessed that he would have given up if an experienced resident had not helped him process the paperwork.

Finally, other policies hampered the riverine trade. In 1850, the provincial government decided to 'forbid, in all waters of the province, the canoes that conduct itinerant commerce' ['*regatão*'], while allowing for permanent trading outposts.[128] Many of these itinerant traders were Portuguese or Moorish Jews so they were often treated as outsiders or interlopers by native-born Brazilians.[129] Still, this policy caused so much disruption to legitimate transportation that it was soon revoked.

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125 Falla dirigida pelo exm.o snr. conselheiro Jeronimo Francisco Coelho, presidente da provincia do Gram-Pará, á Assembléa Legislativa Provincial na abertura da sessão ordinaria da sexta legislatura no dia 1.o de outubro de 1848, 31.

126 Relatorio apresentado á Assembléa Legislativa da provincia do Pará na primeira sessão da XIII legislatura pelo exm.o senr. presidente da provincia, dr. Francisco Carlos de Araujo Brusque em 1.o de setembro de 1862

127 Wallace, *A Narrative of Travels on the Amazon*, 51.

128 "Resolucao 182 de 9 Dezembro 1850," Arquivo Publico do Para.

129 Edwards, *A Voyage up the River Amazon*, 36.

It might then make sense that the provincial authorities and landowning elites in the Amazon made no effort to save the rubber shoe trade, but we still have to consider why the *caboclos*, river traders, international merchants, and US retailers that had built the Amazonian rubber shoe industry did not resist its demise either. If anything, they expedited it. We can trace the chain of events that culminated with the disappearance of the Amazonian rubber shoe industry to Thomas C. Wales and other shoe retailers in the US. By the mid-19th century, Wales had become the largest wholesaler of rubber shoes in the US.[130] Given his prominence, it was only natural that American rubber manufacturers sought him out to distribute and retail vulcanized shoes alongside his other products.[131] This privileged position allowed Wales to keep tabs on both segments of the market so he was probably one of the first to notice that vulcanized rubber shoes were poised to displace their Amazonian counterparts. In 1851, Wales acted on this insight and used some of the capital he had accumulated in the Amazonian rubber shoe trade to buy shares in the Goodyear Metallic Rubber Shoe Company (GMR), the first Goodyear licensee to manufacture vulcanized shoes in the US. Over the next two years Wales invested an even larger share of his capital in domestic manufacturing. By 1853, he was GMR's largest shareholder and a member of its board of directors. Wales also convinced John Bertram, who had joined him in importing rubber shoes from Brazil, to buy shares in the Goodyear Metallic Rubber Shoe Company.[132]

As leading retailers such as Wales and merchants such as Bertram invested in US-based rubber manufacturing, they also directed their agents and business associates involved in the

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130 Slyck, *New England Manufacturers and Manufactories*, 626-632.

131 *Ibid.,630*

132 *Ibid., 630.*

Amazonian trade to stop buying rubber shoes and start buying increasing quantities of blocks or slabs of crude rubber. This sudden increase in demand for crude rubber caused prices to soar. Between 1847 and 1857, crude rubber exports doubled in quantity while FOB prices increased seven-fold.[133] Following this lead, the managers of large trading houses in Belém and river traders throughout the Amazonian countryside repurposed the resources, connections and expertise they had developed during decades of buying rubber shoes to buying crude rubber instead. Forest dwellers adjusted as well, and replaced the wooden lasts they had been using to manufacture shoes with wooden spindles or spades to make blocks of crude rubber.

Neither *caboclos* nor river traders had any reason to lament or resist this shift. The basic rubber tapping and smoking techniques remained the same, and forest workers retained their autonomous lifestyle, with access to consumer goods. At most, the production of crude rubber required less skill or attention to detail than shoe-making and, given the sudden surge in prices for crude rubber, producers could probably make more money for the same effort anyway, when compared to making shoes a year or two before.[134] Similarly, river traders faced the same opportunities and constraints as before, and continued to pursue tappers with cash or merchandise to create debt-credit relationships.

Ultimately, the Amazonian transition from rubber shoes to crude rubber was unlike the transition from craft to mechanized production in Lynn, Massachusetts, where artisans tried to

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[133] Relatorio apresentado a Assemblea Legislativa Provincial por S. Exca. O Sr. Vice-Almirante e Conselheiro de Guerra Joaquim Raymundo de Lamare, Presidente da Provincia, em 15 de agosto de 1867, 12-13.

[134] Rubber tappers only started mobilizing to make collective claims in the 1970s, when tappers who had joined the World War II effort to supply the US with rubber began asking for government assistance. And they began to see some results in the late 1980s, when their cause converged with the global push to save the rainforest. See Seth Garfield, In Search of the Amazon: Brazil, the United States and the Nature of a Region (Durham, N.C., 2013), 204; see also Margaret Keck, "Social Equity and Environmental Politics in Brazil: Lessons from the Rubber Tappers of Acre," Comparative Politics 27, no. 4 (1995): 409-424.

hold on to their skills.[135] And it was not like cotton weaving in India, Egypt or Turkey, where native producers begrudgingly lost ground to English competitors.[136] Rather, all the actors along the Amazonian rubber shoe supply chain – US retailers, international merchants, river traders, and *caboclos* – continued to do business with each other in roughly the same manner they had done before. Deep down, the Amazon rubber shoe industry did not really vanish; it simply morphed into the production of crude rubber, which then burgeoned into the rubber boom.

6 - CONCLUSION

Taken together, these findings suggest that the rise and fall of the Amazonian rubber shoe industry, despite some peculiar features, was not an exceptional episode in the evolution of global capitalism, but an example of the inequalities that it creates. The Amazonian rubber shoe industry was not really home-grown, but erected almost entirely by US merchants and retailers through their agnostic pursuit of profits. Initially, these businessmen tried to import crude rubber to be processed in the US, but the effort failed. Prior to vulcanization, the only way to produce viable rubber goods was to do it in the forest, near the trees. Instead of buying the shoes in Brazil at arm's length or investing directly into production as was the practice of the early American multinationals examined by Mira Wilkins and the British traders studied by Geoffrey Jones and Rory Miller,[137] American merchants engaged with Amazonian *caboclos* and river traders to help them perfect their products so the shoes could be sold to demanding

[135] Dawley, *Class and Community*

[136] Sven Beckert, *Empire of Cotton: A Global History* (New York 2014)

[137] Mira Wilkins, *The Emergence of Multinational Enterprise: American Business Abroad from the Colonial Era to 1914* (Cambridge, Mass., 1970); Geoffrey Jones, "Multinational Trading Companies in History and Theory," in *The Multinational Traders*, ed. Geoffrey Jones (London: 1998), 1-21; Geoffrey Jones, *Merchants to Multinationals: British Trading Companies in the Nineteenth and Twentieth Centuries* (Oxford, 2000); Miller, *Britain and Latin America in the Nineteenth and Twentieth Centuries*.

consumers abroad. In addition, while vulcanization effectively destroyed the Amazonian rubber shoe industry, the demise was not experienced as such by any of the major participants, as the underlying relations of production and exchange that buttressed the manufacture of rubber shoes continued mostly intact during the period that followed it, when the Amazon became a major producer and exporter of crude rubber.

As American merchants and their Amazonian counterparts traded with each other, they produced gains that were mutual but not equal. On the American side, and as shown by Daniel Headrick in other contexts,[138] American merchants only exported technology that furthered their own interests, and withdrew their support for the Amazonian shoe industry once vulcanization had superseded the native mode of production. Even more important, and similar to traders elsewhere,[139] American merchants and retailers retained their latitude to explore alternatives and invest in activities and technologies that complemented their resources and skills while substituting the resources and skills of others. As a result, they kept on fostering and seizing new opportunities that moved them ahead. In turn, the fate of their Amazonian counterparts confirmed Barbara Weistein's argument that pre-capitalistic relations of production prevented the accumulation and diversification of the economy.[140] As a result, the *caboclos*, river traders, and even landowners and government officials, had to react to events they could not anticipate or control and ultimately embraced an economy based on raw rubber exports, with all the limitations that it entailed.

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[138] Daniel Headrick, *Tentacles of Progress: Technology Transfer in the Age of Imperialism, 1850-1940* (New York, 1988)

[139] Geoffrey Jones, *Merchants to Multinationals*; Geoffrey Jones, "Multinational Trading Companies in History and Theory,", 2; Miller, *Britain and Latin America in the Nineteenth and Twentieth Centuries*, 80.

[140] Barbara Weinstein, *The Amazon Rubber Boom*