AFD Ep 364 - The Race for Rubber [Nate/Bill/Kelley] - Recording April 11

- This week on the show we're talking about the industrialization of natural rubber use and its consequences for people in the global south. [discussion order: first ancient history, then industrial history, then Amazon boom, then Africa, then Asia]
- Nate to talk about "King Leopold's Ghost" and Belgian Congo
    - P159
    - 1890-1904 - total rubber earning x96 over
    - Women kept as hostages
    - Metal disks for quotas around neck
    - Chicotte whip
    - Tapping the rubber - cutting through the vine is punished by death
    - Hundreds of chinese railway workers dead
    - Raze villages to plant more rubber
    - Leopold was like a CEO focused on profits to recoup his investment - needed t maximize profit before competitors got online
    - 1890 bicycle craze - Dunlop and Firestone lead to increased demand for tires, hoses, insolation
    - "In 1897, for example, one of the companies, the Anglo-Belgian India Rubber and Exploration Company, or A.B.I.R., spent 1.35 francs per kilo to harvest rubber in the Congo and ship it to the company's headquarters at Antwerp—where it was sold for prices that sometimes reached 10 francs per kilo, a profit of more than 700 percent. By 1898, the price of A.B.I.R.'s stock was nearly thirty times what it had been six years earlier."
    - Rubber was not capital intensive - only labor required
        - Had to climb higher and higher to tap rarer vines - often people fell
        - Had to spread it on body
        - "The native does not like making rubber, he must be compelled to do it" - Louis Chaltin - Force Publique
        - 24 days per month spent in forest, sleeping in cages for protection against leopards
        - Quotas - 3-4 kilos per fortnight
        - Dig up roots
    - Metal disks to track laborers - 47K
    - Paid with cloth, beads, a knife
    - Cartridge used? You need a hand
    - A Catholic priest who recorded oral histories half a century later quotes a man, Tswambe, speaking of a particularly hated state official named Léon Fiévez, who terrorized a district along the river three hundred miles north of Stanley Pool: All the blacks saw this man as the Devil of the Equator. . . . From all the bodies killed in the field, you had to cut off the hands. He wanted to see the number of hands cut off by each soldier, who had to bring them in baskets. . . . A village which refused to provide rubber would be completely swept clean. As a young man, I saw [Fiévez's] soldier Molili, then guarding the village of Boyeka, take a big net, put ten arrested natives in it, attach big stones to the net, and make it tumble into the river. . . . Rubber caused these torments; that's why we no longer want to hear its name spoken. Soldiers made young men kill or rape their own mothers and sisters.
    - Missionaries expose the rubber trade, Edward Morel,
        - We are tired of living under this tyranny. We cannot endure that our women and children are taken away

        - And dealt with by the white savages. We shall make war. . . . We know that we shall die, but we want to die. We want to die.
    - Edmund Morel
        - Noticed the imbalance of trade, published documents
        - Morel quoted a letter that a Force Publique officer, Lieutenant Édouard Tilkens, had written to his commander: “I expect a general uprising. I think I warned you of this, Major. . . . The motive is always the same. The natives are tired of . . . transport work, rubber collecting, furnishing livestock. . . . For three months I have been fighting, with ten days’ rest. . . . I have 152 prisoners. Yet I cannot say I have subjugated the people. . . . They prefer to die. . . . What can I do?”
        -
    - Roger Casement diary
        - Recorded rubber trade, homosexual encounters, castration
        - Eventually diary was discovered and he died in jail
        -
    - Profits built palaces - 1987 worlds fair exhibition with “pygmys”
    - Paid my the number of hands
    - George washington williams - Union vet, black historian, exposed the truth
    -
    - HBO Max - Exterminate the Brutes by Raul Peck
- Latin America
    - https://www.nationalgeographic.com/science/article/100628-science-ancient-maya-aztec-rubber-balls-beheadedz
        - The Aztec, Maya, and Olmec of Mesoamerica used natural rubber for multiple purposes. The two purposes that are cited most frequently are sandals and rubber balls for games.
        - Not only did they use rubber, but they mixed it with morning glory vines, which made the latex less brittle.
        - The ratio of latex and morning glory vines depended on whether it was more important for the rubber to be durable or bouncy.
        - These early societies of Mesoamerica were committed to scientific inquiry, so it is not surprising that they made these advancements.
        - Records indicate that societies in Mesoamerica were using this latex mixture by 1600 BC, 3000 years before Good year “vulcanized”/stabilized rubber in 1839.
    - https://en.wikipedia.org/wiki/Natural_rubber
        - Charles Marie de La Condamine is credited with bringing rubber samples to France in 1736.
        - Charles Goodyear figured out how to vulcanize (stabilize) rubber in 1839.
        - During this time, South America was the main source of rubber.
    - https://lab.org.uk/the-putumayo-atrocities/
        - It is likely unsurprising to you that Europeans exporting a natural resource from South America in the 19th century lead to significant atrocities.
        - One in particular that I’d like to point out is the Putumayo atrocities.
        - Julio César Arana had established himself as a rubber baron in Peru’s Amazon, and primarily used the indigenous people for the very physical work of harvesting rubber. Not only did he enslave people from the region, but he also brought people from the Carribean and enslaved them.

    - “Arana’s raise to a position of power, money and influence was aided by the geographical conditions of Peru. To travel from Iquitos to Lima, it was necessary to go around what is now Panama by boat, a journey that would take weeks. It took less time to reach the coasts of Portugal or Madeira than Lima. The Amazon was, in many ways, an autonomous region, where borders were loose and political control from the central government was almost non-existent. Furthermore, the government needed the entrepreneurs to protect the border against foreign invasions. This allowed people like Julio César Arana to act with complete impunity. The local judiciary was in place to protect the interests of local businesses. People from outside the region were not welcomed.”
- https://en.wikipedia.org/wiki/Amazon_rubber_boom
    - The Amazon Rubber Boom took place from 1879 to 1912 - in the Amazon Basin of Brazil and Bolivia.
    - 1855 = 2100 tons of rubber extracted, 1879 = 10000 tons
    - “Centered in the Amazon Basin, the boom resulted in a large expansion of European colonization in the area, attracting immigrant workers, generating wealth, causing cultural and social transformations, and wreaking havoc upon indigenous societies.”
    - In some areas as much as 90% of the indigenous population was wiped out.
    - The booming rubber industry also meant a lot of wealth (for some) and infrastructure in the region.
    - Manaus, capital of the Brazilian state of Amazonia, had a per capita income of twice as much as Brazil’s coffee producing regions. There was a theatre built, electric trams, etc. It was also the world capital of the sale of diamonds.
    - Another notable aspect of the rubber boom was that as rubber workers began to need more and more rubber, they advanced onto territories that were not theirs. This created significant tension between Brazil and Bolivia.
    - Navigating through the Amazon was a significant challenge. There were waterways, but they were hard to navigate, especially with the scale of rubber being produced. So, a railway was built.
    - “The Madeira-Mamoré Railroad became known as the "Devil's Railroad" on account of having caused the death of around six thousand workers (in legends said to be one dead worker per railroad tie attached to the rails) was constructed by the United States corporation of Percival Farquhar. “
    - The railroad was finished in 1912, just as the rubber industry began waning.
    - The Amazon Rubber Boom gave way as Southeast Asia began to produce more rubber.
    - There was a second rubber boom in 1942-1945 as demand grew for rubber during WWII.
- https://en.wikipedia.org/wiki/Fordl%C3%A2ndia
    - One of the more bizarre aspects of the Amazon’s rubber industry was the building of the town “Fordlandia” by Henry Ford in 1928, a few decades after the end of the rubber boom.
    - Ford sought his own source of rubber so as to not have to deal with the British rubber monopoly.

        - Ford signed a deal for 2.5 million acres of land in Brazil and an exemption from all export taxes in return for 9% of the profits.
        - Getting to the town was difficult, the Ford managers knew nothing of Amazonian agriculture, and many succumbed to malaria and yellow fever.
        - In typical Ford fashion, he dictated the rules of the community - no alcohol, no women, no football, etc. They even went door to door to do inspections of people's houses.
        - In 1930 there was even a revolt (called Breaking Pans) over all the American food that was served in the cafeteria and they eventually started serving different food.
        - With all of the project failures and the development of synthetic rubber, the project eventually failed and Henry Ford's son sold the land back to the Brazilian government at a loss of $20 mil USD.
    - https://en.wikipedia.org/wiki/Henry_Wickham_(explorer)
        - "Sir Henry Alexander Wickham (29 May 1846 – 27 September 1928) was a British explorer and plant-thief. He was the first person to successfully export a large, viable shipment of Brazilian rubber seeds to the British Empire. He did so under false pretenses. The British had long planned to create rubber plantations in Southeast Asia, and using Wickham's batch, the resulting plantations brought about the end of the Amazon rubber boom."
        - Maybe the greatest "bio-spiracy" in history?
        - The seeds arrived to Kew Gardens in 1876. Of the 70,000 seeds he smuggled, only 2, 400 germinated, but it was enough to begin spreading throughout the British empire.
    - https://en.wikipedia.org/wiki/Henry_Nicholas_Ridley
        - Henry Nicholas Ridley is largely responsible for the success of rubber harvests in Southeast asia.
        - Ridley was the first scientific director of the botanical gardens in Singapore and widely distributed rubber seeds across the region.
        - He developed a method for tapping trees for rubber without injuring the tree.
        - He was well known for his passionate advocacy of rubber for industrial use, so much so that he earned the nickname "Mad Ridley".
        - "Ridley was also largely responsible for establishing the rubber industry on the Malay peninsula,[10] where he resided for twenty years. The area under Pará rubber slowly increased after 1898 when a Chinese landowner, Tan Chay Yan, grew 40 acres successfully, leading to more people taking to rubber cultivation."
        - https://www.britannica.com/science/rubber-chemical-compound/Development-of-the-natural-rubber-industry
- Bill to talk about industrial uses
    - Rubber experimentation in Europe occurred from the Columbian exchange until the end of the 18th century when early industrial capitalism started trying to seriously put rubber into use as an industrial product component.
        - Research in the second half of the 1700s had come up with better knowledge of rubber's properties, advantages, and disadvantages, as well as gradually some ideas on how to use it as more than a novelty.
        - "A rubber factory making ladies' garters began production in France in 1803." (Citation: "The fate of the forest : developers, destroyers, and defenders of the Amazon" by Susanna Hecht, 2010. University of Chicago

Press. p. 72.) Wikipedia offers a summary of how rubber has been used in the textile industry: *Rubber produced as a fiber, sometimes called 'elastic', had significant value to the textile industry because of its excellent elongation and recovery properties. For these purposes, manufactured rubber fiber was made as either an extruded round fiber or rectangular fibers cut into strips from extruded film. Because of its low dye acceptance, feel and appearance, the rubber fiber was either covered by yarn of another fiber or directly woven with other yarns into the fabric. Rubber yarns were used in foundation garments. While rubber is still used in textile manufacturing, its low tenacity limits its use in lightweight garments because latex lacks resistance to oxidizing agents and is damaged by aging, sunlight, oil and perspiration.* [Eventually this natural rubber was supplanted in the industry by synthetic rubbers such as spandex, because they are more durable and stronger than natural rubber-based fiber.] https://en.wikipedia.org/wiki/Natural_rubber#Pre%E2%80%93World_War_II
    - Rubber can be very temperamental in both the harvesting process and the industrial production process, with a lot of room for error or permanent spoilage resulting from ambient conditions either in the jungle or in the hot, grimy factory.
- Vulcanization: https://en.wikipedia.org/wiki/Vulcanization From 1834 to 1839, Charles Goodyear, a northeastern US experimental chemist and engineer, was experimenting with chemical mixture ideas to harden and strengthen the finicky rubber for industrial purposes. One of the biggest challenges was rubber heating up and melting. So in 1839, he was shocked to discover that it was actually possible to use sufficient heat to harden rubber, rather than melting it, which he patented and named “Vulcanization.” [Originally “fireproof gum”: https://www.britannica.com/science/rubber-chemical-compound/Development-of-the-natural-rubber-industry] (Generally the process also involves sulfur and some molecular bond interactions I don’t understand well enough from my poor performance in 11th grade chem class to explain on air.) But Goodyear had fine-tuned his new process by 1844 to support real production and began licensing the patents for use in Europe. He became a major producer of industrial rubber in the United States, based out of Massachusetts. https://en.wikipedia.org/wiki/Charles_Goodyear
    - He had some problems defending his patents in Britain, but he wrote, “In reflecting upon the past, as relates to these branches of industry, the writer is not disposed to repine, and say that he has planted, and others have gathered the fruits. The advantages of a career in life should not be estimated exclusively by the standard of dollars and cents, as is too often done. Man has just cause for regret when he sows and no one reaps.” (Published in a 1939 centennial book in Boston honoring his work.)
    - He died in 1860, just over 20 years after his invention, and just before the massive rise of rubber usage over the course of the Second Industrial Revolution after the American Civil War, with all the horrors that inflicted on the people of the Amazon and then Africa and Asia.
    - (The Goodyear Tire and Rubber Company founded in 1898 is named in his honor but not connected to him.)
- The rubber extraction boom clearly reflects a ravenously growing demand in the global north: In 1855, over 2,100 tons of rubber was exported from the Amazon;

a figure which reached 10,000 tons by 1879. (Barbara Weinstein, 1983. “The Amazon Rubber Boom, 1850-1920.” Stanford University Press)
    - Plantation production began in the mid-1870s to keep up with demand that could not be met by naturally occurring and often widely dispersed wild sources in the jungle
- Common uses of natural rubber in the pre-World War II era included: wire insulation, door and window profiles, hoses, industrial belts, gaskets, matting, flooring, vibration dampeners, rubber tires (solid or pneumatic, for bikes or vehicles), kitchen gloves & insulation gloves, boots, toy balloons, rubber bands, pencil erasers, the aforementioned textile uses, rain gear (Macintosh was an early pioneer in rubber processing, although it took Goodyear’s vulcanization to make it work as a material, instead of a waterproofing treatment: https://www.britannica.com/science/rubber-chemical-compound/Development-of-the-natural-rubber-industry), certain masks, SCUBA gear, athletic balls https://en.wikipedia.org/wiki/Natural_rubber#Pre%E2%80%93World_War_II
- Synthetic rubber was a relatively small share of rubber in use each year until World War II when the disruption of global rubber production and trade, especially in Southeast Asia, and the urgent rubber demands for war materiel compelled the United States to rapidly ramp up production of petroleum-based artificial rubber by over 100 times to some 820,000 tons a year by 1945. This was apparently achieved through direct US government production during the war, and then sold off to the private sector after the war, according to the Rubber Manufacturers Association. Today about 70% of global rubber is synthetic. https://web.archive.org/web/20160913145725/https://rma.org/about-rma/rubber-faqs
    - By 2008, despite the dominance of synthetic rubber, all the natural rubber still being harvested worldwide exceeded 10 million metric tons per year, led by Thailand, Indonesia, and Philippines https://www.britannica.com/science/rubber-chemical-compound/Development-of-the-natural-rubber-industry