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The Blood of the Nopal: A Case of Indigenous Cochineal Cultivation from 1521-1796

Before the initial European travels to the Americas, red dye was exceptionally rare and valuable, as were the ingredients used to create the dye. Across cultures around the world, the color red has been associated with themes of fire, blood, and especially in the case of Europe, power.¹ The rarity of the color made it nearly impossible for lower-status people to purchase clothes dyed red. As such, red became a color used by nobility across Europe, North Africa, the Middle East, and Asia.² These ‘old-world’ reds were not perfect, however, and rarely imitated the brilliant reds found in nature present on flowers, fruits and berries, and other natural objects. The reds produced by old-world dyes were more akin to scarlet or burgundy, undeniably red but a deeper, less vivid shade. These reds were produced from a few different insects that by the 1500s had developed the catch-all term of “kermes”.³ Although popular, none were able to produce a true red. As such, the desire for a perfect red stayed amongst dyers and the powerful.⁴ Not long after the European discovery of the Americas, those who wished for a vivid red got what they wanted. This dyestuff was not discovered in Europe, nor was it discovered by dyers or alchemists, but by the Spanish Conquistador Hernan Cortes. However, ‘discovered’ is too strong a word to describe Cortes’ work with this new red. Called *grana* by the Spanish, cochineal is a dye that produces a vivid red color. Cortes had forwarded cloth dyed with cochineal to the

¹ Amy Butler Greenfield, *A Perfect Red: Empire, Espionage, and the Quest for the Color of Desire* (New York: Harper Perennial, 2005), 2. ; Elena Phipps, “Cochineal Red: The Art History of a Color” (*The Metropolitan Museum of Art Bulletin* 67, no. 3, 2010), 5.

² Carlos Marichal Selinas, “Mexican Cochineal, Local Technologies and the Rise of Global Trade from the Sixteenth to the Nineteenth Centuries.” In *Global History and New Polycentric Approaches: Europe, Asia and the Americas in a World Network System*, edited by Manuel Perez Garcia, and Lucio De Sousa (Singapore: Springer Singapore, 2018), 255. Greenfield, *A Perfect Red*, 2-3. Phipps, “Cochineal Red”, 6.

³ Greenfield, *A Perfect Red*, 30-31. Jordan Kellman, “Nature, Networks, and Expert Testimony in the Colonial Atlantic: The Case of Cochineal,” (*Atlantic Studies* 7, no. 4, December 1, 2010), 375. Phipps, “Cochineal Red”, 9.

⁴ Greenfield, *A Perfect Red*, 3.

Spanish King, Charles V, along with other treasures from the conquest of Tenochtitlan.⁵

Cochineal had been used in Mesoamerica for hundreds of years prior to Spanish contact, so the Spanish discovery of cochineal is in the same vein as the European discovery of the Americas. Cochineal was well known to Indigenous people in the Aztec Empire and the Americas had been populated by humans for thousands of years. After the red cloth was seen by Charles V, cochineal would rapidly become a valuable import from the Americas, one that the Spanish held a monopoly over.

Cochineal, or *Dactylopius coccus*, is a tiny insect that feeds off the prickly pear (or Nopal) cactus. Cochineal was harvested in the Andes, but it was most likely a proto-*Dactylopius coccus*, as domestication of the insect for easier harvesting had been done in modern-day Mexico later on.⁶ Regardless, cochineal had been an important resource in Central and South American societies. The red from cochineal also functioned as an important symbol, shown in the clothing of nobility and part of tributes. The Spanish, and the rest of Europe for that matter, would soon understand the value of cochineal as well. However, there was a problem; the Spanish initially understood little about cochineal cultivation, as the methods of raising cochineal were different from methods of raising old-world insects. Most crops grown in New Spain initially were old world ones where farmers already had knowledge of how to cultivate them.⁷ Other industries in the Americas that the Spanish understood, such as silver mining, would quickly come under Spanish control.⁸ The Spanish did know that cochineal produced brilliant reds, but due to lack of knowledge on how to cultivate cochineal, the Spanish could not produce enough to satisfy Europe's desire for the dye. Some Spanish naturalists even believed that the red was not

⁵ Raymond L. Lee, "Cochineal Production and Trade in New Spain to 1600" (*The Americas* 4, no. 4, 1948), 454.

⁶ Greenfield, *A Perfect Red*, 37.

⁷ Greenfield, *A Perfect Red*, 66.

⁸ Byron Hamann, "The Mirrors of Las Meninas: Cochineal, Silver, and Clay" (College Art Association: *The Art Bulletin*, Vol. 92, No. ½, 2010), 17-18.

produced by insects, but rather the fruit of the Nopal cactus.⁹ As such, the Spanish would allow Indigenous cochineal farmers to be relatively independent in their production due to their knowledge and cultivation skill. This did not mean there was little Spanish intervention, as contact would happen in markets and churches, as well as through the form of credit and money loans.

Through the lens of cochineal, we can begin to see how Indigenous men were able to benefit and take advantage of Europe's desire for the red dye. Women, on the other hand, would be subject to European social norms, one such being the norm of women not working in governmental agencies. As such, Spanish influence on Indigenous populations in New Spain can be seen through the cochineal trade, with the introduction of Catholicism on the Nahuatl speaking people, particularly nobles. Finally, a look at separate imperial ventures in the cochineal trade, the venture of England in this case, gives us a look at Early Modern trade relations and competitions, and the lengths empires were willing to go in order to control aspects of the international market of goods. These ventures would fail, due to a lack of Indigenous American knowledge pertaining towards cultivation methods. What all of these show is that Indigenous knowledge and culture was the determining factor for the success of the cochineal trade.

The Beginnings of the Cochineal Trade

After Tenochtitlan fell and Cortes began to establish a Spanish presence in modern-day Mexico, cochineal was not a main or even side focus for the conquistadors. Although red-dyed fabrics were enticing and even sent over to Charles V, what the dye itself was and how to harvest it was of little importance initially. Things like silver and gold were more on the mind of the conquistadors as what they were and their value was well known amongst the Spanish. However, Indigenous growers still kept harvesting and producing the dye, until the 1550s when Spain

⁹ Kellman, "Nature, Networks, and Expert Testimony", 376.

began receiving shipments of dried cochineal to be used in the textile industry.¹⁰ In 1554, the total estimated value of the cochineal produced in Mexico was 200,000 pesos per year.¹¹ In its infancy, the overseas cochineal trade was producing quite a bit of capital for the Spanish Empire, especially since Spain had control over all the cochineal producing regions in the Americas.

Prior to Spanish contact, the harvesting of cochineal had been done by the Aztecs and their tributaries for hundreds of years. Cochineal was a product that was given as tribute to the Aztecs by people from the Oaxaca valley.¹² As such, cochineal was a valued commodity among people in the Aztec Empire. Even before the Aztecs, Andean civilizations, such as the Incas, had been harvesting cochineal for dye use. In Felipe Guaman Poma de Ayala's manuscript sent to Charles V of Spain, Ayala details the history of the Inca Empire. Ayala was an Incan scholar, and as such the manuscript serves as an important written document detailing aspects of Incan culture prior to Spanish contact. Multiple entries in sections detailing Inca kings and queens tell of royal garments containing numerous colors, notably red.¹³ This red was most likely from cochineal, which evidence shows was a part of Peruvian dyeing culture from as early as 300 B.C.E.¹⁴

After the Americas had been conquered, the Spanish did not take up the practice producing cochineal, rather they were the ones profiting off of Indigenous labor. However, this labor does not seem to be forced, as many cochineal farms were actually home gardens that families worked on.¹⁵ Only the female insects were collected by farmers, as males were not stationary. Female cochineal insects would attach themselves to a pad on the cactus and suck the

¹⁰ Lee, "Cochineal Production and Trade in New Spain to 1600", 456-457.

¹¹ Lee, "Cochineal Production and Trade in New Spain to 1600", 457.

¹² Phipps, "Cochineal Red", 12-13.

¹³ Felipe Guaman Poma de Ayala, *First New Chronicle and Good Government: On the History of the World and the Incas up To 1615* (Austin: University of Texas Press, 2009).

¹⁴ Edward D. Melillo, "Global Entomologies: Insects, Empires, and the 'Synthetic Age' in World History" (*Past & Present*, no.223, 2014), 251.

¹⁵ Jeremy Baskes, "Colonial Institutions and Cross-Cultural Trade: Repartimiento Credit and Indigenous Production of Cochineal in Eighteenth-Century Oaxaca, Mexico" (*The Journal of Economic History* 65, no. 1 2005), 204.

rich juices from it. The females would then produce a white wax to protect themselves and their eggs from the elements and predators.¹⁶ As mentioned previously, it was in Mexico where cochineal had become domesticated. While this domesticated cochineal produced more vivid reds and was easier to harvest due to its cotton-like web being thinner, this also made the insect nearly defenseless. After being harvested from the pad, the insects would be dried, one way to do so was to lay the insects out in the sun for a few days.¹⁷ Due to the fact that cochineal lived on the pads of the Prickly Pear cactus and stayed there its whole life, it was an easy target for a variety of predators. As such, cochineal requires near-constant attention in order to make sure that the insects survive and are able to be harvested.¹⁸ Large-scale Spanish farms that were used for other crops would not be able to effectively produce and harvest cochineal, so small Indigenous gardens were where most cochineal was produced.

While it was Indigenous farmers who did most of the cochineal production, Spaniards were the ones who had the means to finance the dye. With the Old World entering the market for cochineal, Indigenous farmers had to increase labor to keep up with the demand. To create one pound of dried cochineal, 70,000 individual insects were needed.¹⁹ In order to convince more people to cultivate cochineal, and to fund the ones already doing so, the Spanish would give cochineal farmers financial credit, expecting to be paid back in the form of cochineal, which would then be shipped back to Europe for a profit. This system came to be known as *repartimiento*, with the advances of money sharing the same name.²⁰ Jeremy Baskes' essay on the *repartimiento* in colonial Mexico does a fantastic job at exploring the relationship between

¹⁶ Melillo, "Global Entomologies", 252.

¹⁷ *Observations on the Making of Cochineal, According to a Relation Had from an Old Spaniard at Jamaica, Who Had Lived Many Years in That Part of the West-Indies Where Great Quantities of That Rich Commodity Are Yearly Made* (*Philosophical Transactions of the Royal Society of London* 17, no. 193, January 1, 1686), 503.

¹⁸ Greenfield, *A Perfect Red*, 37. Baskes, "Colonial Institutions and Cross-Cultural Trade", 192-193.

¹⁹ Lee, "Cochineal Production and Trade in New Spain to 1600", 451. Melillo, "Global Entomologies", 253.

²⁰ Baskes, "Colonial Institutions and Cross-Cultural Trade", 194.

Indigenous debtors and Spanish creditors. In short, these loans were done to give Indigenous farmers the money to sustain themselves while waiting for the cochineal to mature, with the average loan size being 9 pesos for six pounds of cochineal, or around 36 days worth of work.²¹ With 70,000 insects required to produce one pound of cochineal, the work for six pounds must have been considerable, however this wage seems to be fairly standard. While this system did have drawbacks, with Spaniards being able to seize possessions if Indigenous farmers did not pay, it also gave Indigenous farmers a way to make considerable amounts of money, as the Tlaxcalan *cabildo* points out. The Tlaxcalan *cabildo* was the local municipal council made up of Indigenous Tlaxcalan noblemen who ruled for the Spanish, and who recorded the proceedings of their meetings

In a record of their meeting on March 3, 1553, 30 years after the Fall of Tenochtitlan, the *cabildo* discusses cochineal and the supposed problems that it is causing amongst local farmers. These problems, however, affected the *cabildo* more than the cochineal cultivators, as evidenced by the complaints. According to the *cabildo* “[the] owners of cochineal cactus...are very occupied only with their cochineal, by which their money, cacao beans, and cloth are acquired.”²² While items like clothes and money seem like ordinary items to receive in a trade, cacao beans are evidence of luxury goods being purchased through the means of cochineal. Cacao was not grown locally and had to be imported to the region, therefore the fact that it was acquired often enough to be mentioned proves that cochineal allowed some to afford some luxury items. Other luxury goods that were able to be purchased were pulque and Castilian wine, saying “even though it is very expensive, they [cochineal farmers] pay no heed.”²³ While not directly

²¹ Baskes, “Colonial Institutions and Cross-Cultural Trade”, 204.

²² “The Evils of Cochineal, Tlaxcala, Mexico (1553). In *Colonial Spanish America: a Documentary History*. edited by William B Taylor and Kenneth Mills, (Wilmington: Delaware Scholarly Resources, 1998), 91.

²³ “The Evils of Cochineal”, 92.

mentioning *repartimiento* or debts that were to be paid, this record goes into great detail in telling the wealth that some Indigenous farmers enjoyed. Through currency earned by trading cochineal, Tlaxcalans could afford not only basic amenities but also luxury goods from far-off places. This fact would mirror (unevenly, however) what the Spanish were able to do from this lucrative dye trade.

Along with complaining that no one is cultivating fields for food, the *cabildo* also tells of a general loss of respect for lords and noble people. The record tells that cochineal farmers “no longer [respect] whoever was his lord and master, because he is seen to have gold and cacao.”²⁴ While the *cabildo* claims there is a loss of respect due to wealth gained from the cochineal trade, it is more likely that cochineal farmers did not need to rely on the Tlaxcalan lords any longer. With cochineal farmers gaining money, more successful cultivators most likely increased their status through financial gain. This increase in wealth upset the noble lords that made up the *cabildo* due to a loss in power because of new wealthy farmers, ones who previously harvested cochineal mainly for tribute purposes. The *cabildo* goes as far to state in the record that “before cochineal was known and everyone planted cochineal cactus, it was not this way.”²⁵ Interestingly, the *cabildo* uses the wording ‘before cochineal was known’. If they were referring to knowledge of cochineal among Nahuatl speaking peoples (the Aztecs), then the Tlaxcalan noble lords are sorely mistaken, as described in previous pages. Aztec tribute manuscripts show that cochineal was part of the annual tribute owed by regions within the empire.²⁶ Perhaps, however, the *cabildo* is referring to European markets' knowledge of cochineal, and the brilliant red it produces.

The European demand for cochineal undoubtedly increased the amount of cochineal produced in Mexico. As such, farmers were able to make more money rather than giving away

²⁴ “The Evils of Cochineal”, 92.

²⁵ “The Evils of Cochineal”, 92.

²⁶ Phipps, “Cochineal Red”, 15.

their products as tribute to the empire. The Aztec manuscript mentioned previously shows that 2 *zurron* of cochineal were owed to Tenochtitlan from the Oaxaca region each year in the early 1500s. A *zurron* was a Spanish leather bag used to transport goods, and the amount of cochineal in these bags would be around 125 pounds.²⁷ While not what Oaxacan cochineal farmers would use to transport the dyestuff, it works as a metric for conversion. In comparison, the amount of cochineal needed to keep the British wool dyeing industry healthy in 1707 was “Fifty to Sixty Thousand Pound Weight of Cochineal.”²⁸ While later temporally, the huge difference in cochineal production and the fact that the amount stated was for Great Britain alone is astonishing.

The sudden increase in demand for cochineal clearly disrupted pre-existing social hierarchies in New Spain after the fall of Tenochtitlan. With a surge of capital, Tlaxcalan nobles felt threatened by the wealth that was gained by previously low-class farmers. However, a surge in capital and interest was far from the only thing to come from Europe after the colonization of the Americas. Religion, specifically Catholicism in New Spain, was another disruptive force in the traditional hierarchies of Tlaxcala. While priests and friars did not come over with the explicit purpose of making money in the cochineal market, their preaching’s lead to changes in morals and laws that affected cochineal farmers and their families.

Throughout the *cabildo* record, the group repeatedly mentions the sins and immorality that cochineal appears (in their opinions) to be causing. Along with cochineal farmers purposely missing Mass and working on “Sundays and holy days”, the *cabildo* pays specific attention to women and the sins committed by them. The record states “When they [women] are not collecting cochineal quickly, then they go to the various homes of the cochineal owners...they

²⁷ Phipps, “Cochineal Red”, 13.

²⁸ Great Britain. Parliament. House of Commons. *Reasons humbly offer'd to the honourable House of Commons, for passing the bill for a free importation of cochineal for a limited time.* ([n.p.]: n.p., 1707?).

make the women drunk there, and there some commit sins.”²⁹ The ‘sins’ in this case could be over-consumption of alcohol, or sex between non-married couples. Attention is paid to the sins of cochineal farmers, but there is an emphasis on women in particular. Rebecca Overmyer-Velazquez’ work details extensively the changes in Aztec (Nahua was the common regional language) beliefs in social order and morality.³⁰ The work studies the Florentine Codex, written by Fray Bernardino de Sahagun, a friar in New Spain who arrived in 1529. Overmyer-Velazquez states that Sahagun “condemned the Indians, both female and male, most strongly [for] excessive sexuality.”³¹ A consequence of said apparent ‘excessive sexuality’ was for priests to encourage women to stay at home and let their husbands provide for the family, in an effort to keep women’s virginity.³² Overmyer-Velazquez also points out that Franciscans often taught the sons of Nahua nobility more thoroughly than commoners, and the *cabildo* in this case could be made up of people taught by Franciscans. While perhaps having Catholic values, the *cabildo* was also under the authority of the viceroy of New Spain at the time, Don Luis de Velasco. For the *cabildo* to retain their power, it was important to rule as the Spanish wanted them to. These Tlaxcalan nobles most likely wanted to retain what powers they still possessed, and as such followed the doctrines of Catholicism, the main religion in Spain.

With ideas of cochineal leading to a change in hierarchical structure and beliefs in the morality of women working in the industry changing, the *cabildo* of Tlaxcala and the viceroy of New Spain ordered that no one was to exceed ten cactus plants for cochineal, and that women were not allowed to gather and sell dye at the markets.³³ This 10-cactus limit was soon ignored,

²⁹ “Evils of Cochineal”, 92.

³⁰ Rebecca Overmyer-Velazquez, “Christian Morality in New Spain: The Nahua Women in the Franciscan Imagery” In *Bodies in Contact: Rethinking Colonial Encounters in World History*, edited by Tony Ballantyne and Antoinette Burton (Duke University Press: Durham and London, 2005).

³¹ Overmyer-Velazquez, “Christian Morality in New Spain”, 69.

³² Overmyer-Velazquez, “Christian Morality in New Spain”, 72.

³³ “Evils of Cochineal”, 93.

as European need for cochineal continued to grow in the mid-1500s.³⁴ As more cochineal was desired, more Nahua people sought to grow and make money in this new burgeoning market. The regulation barring women from gathering dye at the markets, however, most likely was not removed. With the addition of cochineal in European markets, Tlaxcalan farmers and cultivators certainly benefited from the increase in wealth and property. Luxury goods were able to be purchased and the social order was seemingly under threat based on the record of the *cabildo*. With New Spain being open to European markets, it was also open to European influence, in this case, Catholicism. With the enforcement of Catholic moral traditions, Nahua women lost more and more rights, not just being barred from going to the markets to make money, but even being discouraged from leaving their homes. Nahua men, however, clearly benefited from the arrival of Europeans in the cochineal market, as more and more cochineal would be grown as time went on, proving that cochineal was a sound crop investment and a gateway to potentially gaining luxury goods.

After cochineal was harvested and dried in New Spain, it was bought in markets and shipped back to Europe to be used as a dye for cloth, and in the case of England, woolen goods.³⁵ As cochineal was produced solely in Spanish holdings, it was also sent to Spain to be distributed to the rest of Europe. Much of the dye sent from New Spain went to the port city of Seville, where the amount imported would determine the price of cochineal for the year to come.³⁶ In essence, Spain had a monopoly over the most valuable and accessible red dye in the world. The arrival of a Spanish Flotilla, or the disappearance of one, could easily affect the amount of cochineal available in all of Europe and affect the whole of the dying industry. Not only was the red produced the finest in the world at the time, but dye makers also practically had to use

³⁴ Greenfield, *A Perfect Red*, 96.

³⁵ House of Commons. *Reasons humbly offer'd*, ([n.p.]: n.p., 1707?).

³⁶ Greenfield, *A Perfect Red*, 77. Lee, "Cochineal Production and Trade in New Spain to 1600", 458.

cochineal or settle for the inferior quality of kermes. Looking at the English textile industry shows how the Spanish monopoly over cochineal greatly affected European textile production.

Cochineal on the Market

The plight of wool dyers can be observed within a petition to the English House of Commons in 1707, one that called for a free importation of cochineal due to a shortage of the dye.³⁷ The plea claims that “Fifty to Sixty Thousand Pound Weight of Cochineal is required for one Year’s Consumption in Dying” and that due to a lost Spanish flotilla “there has arrived in Spain but thirty seven Bags, which do not amount to eight thousand Pound Weight.”³⁸ Due to this sudden shortage of cochineal, the writer claims that “great Quantities of Cloths...remain white in the Maker’s Hands” as they were meant to be dyed red. Although the specific amount of these undyed cloths is not disclosed, the loss of cochineal easily halted a great portion of the British dying industry. It is also important to note that cochineal red was most likely used to also create other colors, such as purple, and as such it was not just fabrics that were to be red that were halted in production.³⁹

Not only did the sudden loss of cochineal cause production to stagnate or even halt, but it also caused an inflation of the price per pound of cochineal. The letter to the House of Commons claims that “before Application was made to Parliament for this Bill, cochineal was cheaper in Holland by Ten Shillings [per] Pound than in England.”⁴⁰ The letter also cites fear that due to this difference in pricing, merchants will have a difficult time selling any fabrics colored with cochineal dye, especially to non-English customers. The main reason for this price difference in

³⁷ House of Commons. *Reasons humbly offer'd*, ([n.p.]: n.p., 1707?).

³⁸ House of Commons. *Reasons humbly offer'd*, ([n.p.]: n.p., 1707?).

³⁹ Phipps, “Cochineal Red”, 15.

⁴⁰ House of Commons. *Reasons humbly offer'd*, ([n.p.]: n.p., 1707?).

this case is due to an importation tax on cochineal, and the necessity to get rid of such tax for a short period of time in order to compete in the European textile and dyeing markets.

The point of larger interest is not the English importation tax, but rather the effects of having a valuable commodity come from a separate nation that controls said commodity completely. With the loss of the Spanish flotilla, England only had 16 percent of what was normally required to dye with cochineal, but cochineal prices also shot up due to the sudden shortage. This was a limited-time problem, as other Spanish shipments would eventually come to Europe. However, the issue with cochineal prices was particular to England. This is not to say that shortages of cochineal did not cause widespread price hikes, but rather other nations were able to successfully avoid Spain's artificial price gouging of cochineal through smuggling and illegal trade.⁴¹

A English author, named William Wood, published a survey of English trade in 1722 that outlines some of the problems with England only purchasing cochineal from Spain due to the Acts of Navigation, laws that were passed with the purpose of expanding English self-sufficiency by limiting imports from non-British holdings.⁴² Wood notes that due to the Navigation Acts, England has been restrained from trading cochineal from anywhere besides Spain.⁴³ Other nations, like France, imported cochineal both legally and illegally, so these nations had an easier time avoiding Spanish prices than the English did.⁴⁴ Wood claims that this international difference in cochineal importation puts other nations above England in terms of textile trade and

⁴¹ Kellman, "Nature, Networks, and Expert Testimony", 376.

⁴² Britannica, T. Editors of Encyclopaedia. "Navigation Acts." *Encyclopedia Britannica*, May 27, 2020. <https://www.britannica.com/event/Navigation-Acts>.

⁴³ William Wood, *A survey of trade. In four parts. Together with considerations on our money and bullion*. 2d ed. (London: J. Walthoe, 1722), 235.

⁴⁴ Kellman, "Nature, Networks, and Expert Testimony", 376.

as such England must remove cochineal from the Navigation Acts so industry can compete properly.⁴⁵

One must also note that throughout these English discussions around cochineal importations being disrupted or the cochineal itself being lost, it is repeatedly the fault of Spanish flotillas. There seem to be relatively few disturbances with cochineal cultivation in New Spain. For the Indigenous cochineal farmers, they had already traded with merchants and made their money long before the shipments were lost. As such, it seems that Indigenous cochineal farmers had more benefits than losses with cochineal production, as an increase in demand for cochineal in Europe would mean more money for farmers. They also did not lose money like Spanish merchants when a flotilla disappeared. While Europe depended on Indigenous cochineal production in New Spain, the gamble on cochineal actually arriving in Europe was dependent on Spanish vessels. This is why there seems to be a larger discussion on the Spanish flotillas, rather than the people actually harvesting and cultivating cochineal, which was still smaller gardens taken care of by Indigenous families in New Spain. A benefit of having smaller, garden-based production was that if one family lost their harvest, it would not have a huge impact on global cochineal trade. If cochineal was to be grown in larger scale *haciendas*, a lost harvest would make a much larger impact. This also distributes capital gain amongst more Indigenous families, rather than one European landowner who could potentially keep a large majority of the profits. However, as discussed before, Indigenous familial labor was necessary for cochineal production, as cochineal would be much more difficult to cultivate on a large scale.

While English merchants and authors clearly understood the downsides of solely trading with Spain to import cochineal, these writings cite that the solution was to start trading with other nations in order to lower the cost for textile production. Spain held a monopoly over

⁴⁵ Wood, *A Survey of Trade*, 236.

cochineal and its trade, Spanish merchants could raise the price artificially, so trading with other nations or smugglers could potentially circumvent this price gouging. However, the early desire to understand what exactly cochineal was, coupled with the desire to break the Spanish cochineal monopoly ultimately led to an English attempt to produce their own cochineal far from New Spain.

English Attempt to Cultivate Cochineal

As Spain held a monopoly over cochineal and its production, relatively few other European nations fully understood what it was exactly. Europe only received the dead and dried-out insect and had relatively few interactions with the live insect on the Nopal cactus. Jordan Kellman's work on early scientific inquiries into what cochineal was reveal the multitude of theories as to the nature of the insect.⁴⁶ Some believed that cochineal was a berry or a seed from the Nopal cactus, while others believed the red dye came from a worm or fly. The myriad of different theories made it hard for European nations to emulate Spanish cochineal production.

In the case of the British, the desire to understand the nature of cochineal was more than just an endeavor of looking at dried cochineal under a microscope. Rather, the writings of a Royal Society operative show that communication with people close to areas of cochineal production was a viable strategy. Left unnamed, a Royal Society of London operative writes about a communication they had with an "Old Spaniard at Jamaica, who had lived many years in that part of the West-Indies" where cochineal is produced.⁴⁷ The account is fairly accurate, discussing that cochineal is an insect akin to a ladybug (or Lady Bird) and that it grows on the Nopal cactus and is then harvested and dried. This knowledge of cochineal could perhaps be due

⁴⁶ Kellman, "Nature, Networks, and Expert Testimony", 373-395.

⁴⁷ *Observations on the making of cochineal, according to a relation had from an old Spaniard at Jamaica, who had lived many years in that part of the West-Indies where great quantities of that rich commodity are yearly made* (Royal Society: London, January 1, 1686), 502.

to the old Spaniard having knowledge of other dyes, like Indigo, mentioned at the bottom of the passage.⁴⁸ While the informant never expressly states that they worked with cochineal or cultivated it themselves, knowledge of other New World dyes suggests that this informant was a reliable source.

While at the time this passage could be seen as just another theory into the nature of cochineal, the modern observer can see it as being most correct. The reason for its correctness is due to the fact that a witness to cochineal production was actually asked, rather than a European natural historian trying to understand the nature of cochineal. Many European naturalists worked with dead and dried cochineal, while Indigenous cultivators worked and raised live colonies. Spain was also adamant on keeping their cochineal monopoly, so large European knowledge of what cochineal was and how it was harvested could break the monopoly.⁴⁹ While European naturalists toiled away at the mystery of the dye, Indigenous cultivators were well aware that cochineal was an insect. This was due to the fact that Indigenous people had been cultivating cochineal for hundreds of years and were still the main production force for the dye.⁵⁰

This begs the question if most European naturalists ignored Indigenous knowledge, or if many did not even bother to ask those who produced cochineal. While some naturalists did eventually ask Indigenous farmers what the nature of cochineal was, the myriad of incorrect theories point to the idea that many Europeans did not believe or trust these Indigenous farmers. Although the nature of cochineal became known by Europeans in the late 1700s, the practice of not valuing knowledge would not change. As a result, later attempts by non-Spanish powers to cultivate their own cochineal, specifically the British, would fail due in large part to the removal of Indigenous knowledge. As stated throughout this paper, it was Indigenous farmers in New

⁴⁸ *Observations of the making of cochineal*, 503.

⁴⁹ Kellman, "Nature, Networks, and Expert Testimony", 373-395.

⁵⁰ Kellman, "Nature, Networks, and Expert Testimony", 384.

Spain that worked and cultivated cochineal. When the British attempted to break the Spanish cochineal monopoly by cultivating their own Nopal and cochineal in India, it was doomed to fail from the start.

James Anderson was both a doctor and an amateur naturalist serving with the East India Company in Madras, southern India. While in Madras, Anderson believed that he had seen wild cochineal growing on a species of grass and sent a letter to the head of the Royal Society of London informing them of his discovery.⁵¹ Anderson was incorrect, however, as he had instead found a local kermes variety, one that had been used for reds prior to the European discovery of cochineal. While this discovery was ultimately useless, kermes and cochineal inhabited similar environments, and therefore the theory that cochineal could be produced in southern India was born.⁵² A collection of letters to and from Anderson tell the story of the cochineal venture in India. The letters begin in 1795 with the first being from Captain R. Neilson, who heard of Anderson's cochineal ventures. Neilson's letter describes the procurement of the insect and cactus, but this time getting it from Rio de Janeiro in Brazil, rather than the regions of Tlaxcala or Oaxaca in Mexico.⁵³ Neilson's letter tells that he was already on his way to Rio, so the means of procurement of live cochineal insects was not trade but the finding of wild cochineal most likely.⁵⁴ After the collection of the cactus and cochineal, they were sent to Anderson in southern India, accompanied by a Doctor Roxburgh. However, while on board "nine tenths of our Cochineal Insects have died on account of their refusing all the three plants."⁵⁵ While transportation of dead and dried cochineal was simple, unless the entire ship sank, live

⁵¹ James W. Frey, "Prickly Pears and Pagodas: The East India Company's Failure to Establish a Cochineal Industry in Early Colonial India" (Taylor & Francis, *The Historian*, Vol. 74, no. 2, 2012), 247.

⁵² Arvind Sinha, "Introduction of Cochineal Culture in India: English Plan to Break Spanish Monopoly" (Proceedings of the Indian History Congress, Vol. 57, 1996), 577.

⁵³ James Anderson, *An Account of the Importation of American Cochineal Insects into Hindostan* (Madras: William Urquhart, 1795), 1.

⁵⁴ Frey, "Prickly Pears and Pagodas", 253.

⁵⁵ Anderson, *An Account of the Importation of American Cochineal Insects into Hindostan*, 2.

transportation clearly was not so. The salty and moist air was detrimental to the insects, and as such required consistent monitoring to ensure their survival. James Frey's essay regarding this topic also points out the amazing fact that Nielson "must have obtained at least one male insect, which somehow stayed with the others and survived the voyage to India."⁵⁶ Cochineal is not an asexual insect, so if a male did not make it to India, the entire operation would be in jeopardy.

Ten of the insects did survive the voyage and were put on nopal cactus in southern India. Initially, everything seemed fine, as letters indicate that observers "have not yet observed any one Enemy of the Insects."⁵⁷ After initial successes with the cochineal insects latching on to cactus pads, more Nopal and cochineal was sent to Anderson. However, there were a few problems that were not immediately noticed. First, as noted previously, the cochineal brought to India was a wild variant, not the domesticated and far more popular type of cochineal. The cochineal that had been used in Europe had been domesticated for hundreds of years in order to be easier to harvest and produce better color. As such, the wild cochineal that was now being grown in southern India was an inferior type, one that dyers in Europe tended to stay away from.⁵⁸

The other problem was that there were no predators of cochineal in southern India. The new foreign cochineal species was able to run amok and quickly devoured the cacti that they fed off of, as Anderson reports.⁵⁹ The insects, being parasites, destroyed all Nopal in the area, meaning that new cochineal colonies could not easily be cultivated. In Mexico, the cochineal had to be carefully looked at in order to ensure predators or poor weather conditions did not immediately destroy colonies, but southern India had none of these predators. This was, in fact,

⁵⁶ Frey, "Prickly Pears and Pagodas", 254.

⁵⁷ Anderson, *An Account of the Importation of American Cochineal Insects into Hindostan*, 5.

⁵⁸ Frey, "Prickly Pears and Pagodas", 254.

⁵⁹ Anderson, *An Account of the Importation of American Cochineal Insects into Hindostan*, 7.

on purpose, as the East India Company purposely made sure no natural predators can to India with cochineal. Anderson and the East India Company most likely overlooked the fact that cochineal would destroy everything without predatorial intervention, focusing on the potential monetary gains of a successful cochineal venture rather than the actual cultivation of the insect.⁶⁰

While Nahua speaking peoples had been cultivating cochineal for hundreds of years, regional trade had plenty of time to develop. Not only was cochineal a resource included in tribute lists, but textile production within the Aztec empire also demanded the red dye, meaning that there was also money to be made for producing more than was required by the tribute. After Spanish conquest, the insect was traded throughout Europe and quickly became a necessary dye in the textile industry. Southern India did not have a large textile industry nor was there a long history of trading dye. Likewise, the cochineal that was produced by the British was of inferior quality, and therefore did not have the same economic incentive that cochineal producing in Oaxaca and Tlaxcala did. As such, many Indian landowners were not eager to start cultivating cochineal, as the investment would most likely not pay off and the amount of labor that was needed to produce just a pound of dried cochineal was enormous. Anderson and the East India Company did not foresee this, as they had assumed that the local Indians would not only be better cochineal producers, but also want to enter the cochineal market.⁶¹ The British were not eager to cultivate cochineal either, evidenced by the fact that they had assumed local Indians would do the work for them. While cochineal was successfully produced in southern India, the venture was ultimately deemed unsuccessful, with the combination of less than expected investment and the poor quality of cochineal.

⁶⁰ Frey, "Prickly Pears and Pagodas", 261.

⁶¹ Greenfield, *A Perfect Red*, 195.

Throughout this paper it has been made clear that Indigenous Mexican and Peruvian labor had been invaluable and even necessary for European dying. Both cochineal (native to the Americas) and Indigenous methods of harvesting cochineal led to large amounts of cochineal being sent to Europe. Unlike other luxury goods, like tobacco, cochineal was not harvested or produced on large scale plantations or haciendas, but rather in smaller gardens where individual families raised, harvested, and dried their own cochineal to be sent to market. It also helped that there was a local demand in the America's for cochineal, one that had been present far before the arrival of the Spanish. It also helped that the practice of producing cochineal was old and looking at the amount of cochineal produce, was well known in New Spain.

The British in India had none of these advantages. By introducing a foreign insect to southern India, the ecosystem was thrown off, leading to the destruction of Nopal cactus. Lack of knowledge between the differences of wild and domesticated cochineal meant that the cochineal produced was of lesser quality, and therefore would not be as big of a money maker. Also, while cochineal was produced, it was not on the same scale as New Spain, due to both the expectation that local Indians would want to produce cochineal. To them, cochineal was foreign, so knowledge of production methods was limited, and also there was little local use for the insect, and so there was little investment as cochineal did not impact local investors' lives.⁶²

Conclusions

It is clear how Indigenous knowledge in Mexico and Peru was necessary for the success of the cochineal trade. Without prior domestication and production knowledge, it would have taken far longer for cochineal to be produced at the same scale it was in the early 1700s. As such, the European textile industry inarguably relied on Indigenous labor in order to produce the reds that rapidly became popular. Indigenous cochineal farmers also benefit from this trade, becoming

⁶² Frey, "Prickly Pears and Pagodas", 263.

wealthy in some cases and being able to purchase high quality clothing and luxury goods. When the Aztecs ruled, cochineal was undoubtedly sold, but much of the cochineal produced was for tribute. With the introduction of European markets, families that produced cochineal were able to gain a surplus of money.

Why the Spanish wanted to keep the cochineal monopoly by attempting to restrict knowledge of the insect is also evident. Along with controlling the regions where cochineal was both native and raised, European naturalists mainly had access to the dead and dried up insects sent to Europe. Those that would venture to New Spain would quickly learn from cochineal farmers that it was an insect, not a seed or berry like many in Europe presumed. However, this monopoly did not make rival European nations, like England, happy. This led to an attempt in the last decade of the 1700s to produce cochineal in southern India. Due to the combination of little knowledge of production and local importance, the English cochineal venture was unsuccessful.

In the late 1800s, synthetic dyes would ultimately overtake natural dyes, like cochineal, making them obsolete. Why harvest and dry 70,000 cochineal insects for a pound of dye when the same red could be produced in a factory? Regardless of cochineal's fall from grace, it is clear what an observation of cochineal history through the lens of Indigenous knowledge produces. Many of the successes and failures in the cochineal trade at large were due to (or a lack thereof) Indigenous knowledge when it came to the nature and production of cochineal. As Amy Butler Greenfield states in her novel, "to most Europeans cochineal seemed a gift or nature, a perfect commodity that God had intended them to possess."⁶³ It is clear, however, that cochineal was not a commodity that God created for Europeans, but rather one that was domesticated and grown by

⁶³ Greenfield, *A Perfect Red*, 85.

Indigenous people in the areas of New Spain for the explicit purpose of participating in a new economy.

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