Mexican Cochineal, Local Technologies and the Rise of Global Trade from the Sixteenth to the Nineteenth Centuries

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The history of Mexican cochineal over several centuries represents a key chapter in the origins of early modern globalization, both cultural and economic, since this dye was the most expensive in the world as a result of the consistent demand for luxury textiles—dyed with bright crimson, scarlet or purple colours—by monarchs, the hierarchy of the Catholic Church and aristocrats in Europe, as well among the very rich almost everywhere. Indeed, since the time of the Roman Empire, red and purple had been widely identified with power and wealth. For a long time, European and Asian red dyes were used for this purpose, in particular the Mediterranean kermes dye and the dyes known as Polish and Armenian cochineal. But the special attractions of Mexican cochineal dyes, which arrived in Europe from the early sixteenth century onwards, were that they fixed a more brilliant and deep red colour into woollen or silk cloth, and that they could last unblemished for years and, indeed, as was later learned, continued to do so for centuries. A recent and very attractive

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museum exhibition has demonstrated that Mexican (and to a lesser degree Peruvian) cochineal was sold and applied in luxury textile manufacturing and commercial centres not only in Europe but also throughout the Ottoman Empire, South India the Spice Islands, China and Japan from the mid-sixteenth to the mid-nineteenth centuries.[1]

The first news of cochineal arriving in Europe came shortly after the conquest of the Aztec Empire by the Spanish conquistador Hernan Cortes in 1521. In fact, it was the Emperor Charles V who as early as 1523 wrote to Cortes, indicating that he had received reports of the existence in Mexico of a red dyestuff—referred to as 'grana'—and urging him to send cargoes to Spain since it could be of importance for the royal treasury. The new conquerors and rulers of Mexico were actually more interested in the gold and silver of New Spain, but gradually came to appreciate the high value of the little bags of cochineal dye known as 'grana cochinilla', which were then sent on ships of the Spanish fleets to Seville on their return journey. Cortes had no problem in collecting the red dye as it was a frequent component of the tribute paid by many of the peoples formerly subject to the Aztecs. The administration of Cortes adopted the practice of collecting tribute on the basis of the *Matrícula de tributos*, an early sixteenth-century Mexican codex, which detailed lists of products paid by thousands of peasant communities to the Emperor Moctecuhzoma II before his death in 1520. An indication of their importance was the fact that the Zapotec peoples of the central Oaxaca valley had traditionally been obliged to contribute 20 bags of grana cochinilla every three months, as well as 400 *huipiles* (artistically woven covers), 800 plain tunics and 20 gold discs, all destined for the court of the Aztec Empire.[2]

Cochineal had long been cultivated in Tlaxcala and several other regions of New Spain, but by the late sixteenth century, the bulk of cochineal of the finer quality came to be concentrated in the region of Oaxaca as a result of the strategy adopted by the Spanish administration to establish monopolistic control over the production of 'grana fina', which produced a much higher quality of dye than the more common variety of 'grana silvestre'. This superior type of cochineal was the result of the careful cultivation of the most productive cochineal insects on small plots of nopal, the thick, juicy leaf of a certain variety of cactus that was tended by peasant families. The considerable population density of peasant communities in the mountainous territory of Oaxaca was an

important precondition for the highly labour-intensive cultivation of the nopal plants on which the cochineal insect thrived.

Contemporary descriptions of the cultivation of cochineal evoke the enormous amount of meticulous peasant labour required, which was similar to that of the production of silk worms in rural China in the same era. These parallel and very long commodity chains with peasant origins—silk from China and cochineal from Mexico—met and meshed in Europe in the leading luxury textile centres from the mid-sixteenth century onwards, a fact that indicates the complex nature of early modern globalization and its economic importance to the peoples of three continents. In other words, this chapter suggests the importance and need for future detailed studies on the interaction of the silk commodity chains that originated in China and crossed Asia to Europe, with the cochineal commodity chains that had their origins in colonial Mexico and, for centuries, crossed the Atlantic to the textile centres of Europe and also travelled across the Pacific to Asia via the famous Manila galleons.

In this chapter, emphasis is placed on a series of elements which examine the question of how some special commodities—in this case cochineal—produced in the early modern era by peasants in non-European regions came to play a major role in stimulating global trade and contributed to textile *protoindustrialization* in other continents. We argue that it is essential to understand the relatively simple but also sophisticated technological adaptation carried out by peasants over centuries of an available but highly specialized natural resource that actually led to the creation of a product which quickly generated a global demand. The case of cochineal is our subject here, but other products such as indigo, silk, pepper, cloves, coffee, tea and tobacco provide notable parallels for understanding the peasant and extra-European origins of early economic globalization.[3]

These stories can also serve as a counterpoint to the narratives of tropical commodities in early globalization that traditionally focus more on the role of slavery in plantation economies and particularly on the sugar colonies. In this sense, we suggest that it is also of major importance to analyse the way in which peasant communities in different parts of the world engaged in a series of commercial commodity chains that were essential to the building of global trade in the early modern period. At the same time, it is necessary to analyse the interface between peasants and other actors, whether mercantile or political, who played a key role in the management of the production, taxation and trade of the

commodities mentioned. In this chapter, for reasons of space, the second part of our text focuses on the regional as well as international merchants who took control of the longer and most lucrative parts of the cochineal commercial chains that literally spanned the globe for three centuries.

1 The Oaxaca Indian Communities, Rural Technology and the Secular Production of Cochineal

The name of the most expensive American dye of the *ancien régime*, 'grana cochinilla', was imported directly from Europe, being derived originally from the old Latin term of *coccina* (in Spanish *cochinilla*), which had been used since ancient times to refer to the rich, red colours produced by insects which, when desiccated, were described as *grana* (little grains). The modern scientific name of the little Mexican insect that produces the famous dye is 'Coccus cacti', which refers to the fact that it thrives upon the cactus known as *nopal*, which is abundant in central and southern Mexico.

In the colonial era, the historian Manuel Miño noted that it was also known as 'Nopalae coccininelifera', an insect living on the leaves (nopal) of a native cactus (Miño 1993: 74). According to Richard Donkin, who carried out an exhaustive historical study on cochineal:

> Cochineal insects are parasites of cacti belonging to two closely related genera, *Opuntia* and *Nopalea*; the latter includes eight or nine species, the former over two hundred … The early Spanish historians, commencing with Oviedo y Valdes (1526), compared the fruit (tuna) to large figs, hence the subsequent description 'Indian fig'(higuera de las Indias) … The species most commonly used in rearing cocínela was Opufntia Ficus-indica, found today only in cultivation. (Donkin 1977: 12)

As to the cochineal insect, which is the parasite of the nopal, Donkin offered the following precise commentary:

> Cochineal insects belong to the family Coccidae and to the genus Dactylopius…From the time of our earliest knowledge of the New World, two main kinds of cochineal insect have been recognized: a domestic form, source of *grana fina* (nocheztli), and a wild form, from which *grana silvestre* (xalnocheztli, ixquimliliuhqi) was obtained. *Dactylopius coccus* is double the size of other species and takes about twice as long to complete its life cycle. Father Bernabe Cobo (1653) compared the full-grown insect (4 to 6 mm in length) to a chickpea or kidney bean. (Donkin 1977: 12)

During the colonial era, a natural, wild variety of cochineal, called *Grana silvestre*, was found and cultivated in relatively small quantities not only in Mexico but also in Guatemala and in South America (in Peru and Tucumán, and northwest Argentina) with up to six annual harvests per year, but producing a relatively low-grade dyestuff. The most valuable and important variety of cochineal was the domesticated type grown in Mexico known as *Grana fina*, being twice the size and producing a much richer dye. However, it could only yield three harvests (May, July and October) with production levels of about 250 kilos of these insects per hectare of planted nopals. The enormous amount of peasant labour expended can be indicated by the fact that one pound of the final dye known as 'grana cochinilla' required the desiccation of 70,000 tiny insects.[4]

The cochineal insects were cultivated with extraordinary care by Mexican Indian peasants on the nopal plants. According to both the Spanish chronicles of the sixteenth century and later documents, the Mexican peasants developed a complex pattern of cultivation of the nopal cactus which provided the essential sustenance to the valuable dye-producing insect. In the early chronicle written by Friar Bernardo de Sahagún (the greatest ethnographer of sixteenth-century Mexico), there appear various detailed drawings which illustrate the Nopal plant, the process of harvest and cleaning of the cochineal insects, the use of cochineal for painting and the fabrication of the small loaves of cochineal and their sale at market. These engravings clearly point to a widespread cultivation of cochineal as well as production and trade of the red dye from prehispanic times (see Sahagún 1577).

In short, the technology for development of the red dye was the result of centuries of experimentation by peasant communities who soon found substantial local demand for the product. It is now well-known that Aztec women used cochineal for painting their lips and bodies, that local painters used it for artwork and that it was used for dyeing the leather garments, furs and feathers used by the Aztec nobility. When this consumption largely disappeared after the conquest, it was immediately replaced by the burgeoning demand of European markets for this rare and valuable red dye, the price of which soon rose to great heights.

According to the most detailed reports on the cultivation of the nopal and 'grana cochinilla', most of which date from the eighteenth century, in order to be able to maintain regular harvests of fresh cochineal, the peasants of Oaxaca and some other regions would habitually open

up new fields near their villages by using slash and burn methods, later proceeding to open holes along long lines, using the traditional wood instrument of 'coa' with its sharp point that allowed the user to delve into the earth. Subsequently the peasants would take two or three of the big nopal leaves (each larger than a man's hand) and would insert them into the holes. This process of seeding would normally take place in the months of May or June or alternatively in November or December after the end of the rainy season. In two or three years, the cactus plant acquired maturity and would have many nopal leaves.

Later, there followed a laborious sequence of tasks that included seeding each of the nopal leaves with some 50 baby cochineal insects previously prepared with great care. Throughout this process, the peasants would have to weed with care and be very vigilant in order to eliminate the numerous natural predators that might eat the cochineal insects, as well as to protect the plants from excess rain or cold frosts.

Once the cochineal had matured, the peasants had several ways of killing them in order to extract the valuable red dye. They could do so by boiling thousands of insects directly in hot water and then drying them until they became a red-brown colour. Alternatively, they were baked slowly in the hot sun, making them a silver colour, or they were baked in hot pans or ovens which made the final colour of the 'grains' (grana) black. Subsequently the grains were packed together using diverse procedures, until finally the valuable 'bricks' (*zurrones*) of dried dyestuff were ready for shipment, mainly to Europe.

Originally cultivated in Tlaxcala and several other regions of New Spain, production came to be concentrated in Oaxaca by the late sixteenth century. We have already mentioned the importance of the high population density of peasant communities in this mountainous territory for cochineal production, but, in addition, a complex incentive structure was gradually put in place by the Spanish colonial regime, which made it attractive for Oaxaca peasants to specialize in the production of this natural dye. Local agriculture was mainly subsistence as the production and sale of any agrarian surplus was limited due to poor soils, small regional markets and high transport costs. The high prices of cochineal, in contrast, allowed Indian peasant families to obtain a modest but welcome income from the dyestuffs. In many Oaxaca towns the peasant families also obtained income from the sale of cotton produced in the valleys and from the manufacture of richly coloured textiles.

For the Spanish crown, there were clear fiscal advantages that favoured incentives for the increased production of cochineal. Since the Indian communities (called 'repúblicas de indios') were obliged from the sixteenth century onwards to pay tribute to tax collectors of the colonial administration, it was soon stipulated that in Oaxaca they should preferably do so in cochineal. The reasons were transparent: royal functionaries made substantial profits by selling the dyestuffs to merchants for silver or gold, whereas they had more difficulty in selling other commodities produced by the local, Indian peasant communities.

But the mechanisms of the colonial administration also included a complex dynamic of mercantile control of the cochineal production and trade, which operated on the basis of a close alliance between merchants and local bureaucrats who exploited the Indian communities as far as they could. Two researchers, Brian Hamnett and Carlos Sánchez Silva, have underlined the coactive methods that were employed to force Oaxaca peasants to produce cochineal from the sixteenth century through to the end of the colonial regime (Hamnet 1971; Sánchez 1998). However, coaction was not the only factor involved. The historian Jeremy Baskes has carried out innovative and detailed studies on the cochineal trade in eighteenth-century Oaxaca, arguing that incentives (provided by both merchants and the vice-regal administration) help explain the continued specialization of Oaxaca peasants in the cultivation of the cochineal insects and the production of the dyestuff (Baskes 2001).

Certainly, it would appear that the *repartimiento* system (which lasted until 1787) proved quite successful in ensuring a consistently large cochineal harvest each year. In very basic terms, *repartimiento* functioned as follows: leading Mexico City merchants advanced funds to Oaxaca merchants, who, in turn, provided funds to local bureaucrats (*alcaldes mayores*) in the cochineal-producing towns and villages. The functionaries would lend the monies to the peasants so that they could plant nopal plants or pay for sustenance until the cochineal insects were harvested and sold. Alternatively, the royal functionaries (who actually also operated as merchants) could advance livestock, mainly mules, oxen and bulls, to the farmers who were thus obliged to pay back in an equivalent amount of silver or cochineal at a given date. Therefore, in exchange for the funds or livestock advanced, the peasants agreed to return payment to the *alcaldes mayores* with cochineal at a fixed price (lower than the current international price). The profits made by the royal bureaucrats was

largely based on the difference between the almost fixed price at which they valued the cochineal provided by the peasants (usually 12 silver reales per pound of good cochineal) and the price they received from merchants. This difference varied over time and was very much a function of the complex relations between the Mexican merchant bankers and the local 'alcalde mayores'.

The most abundant statistical information on the Mexican cochineal trade that exists covers the second half of the eighteenth century and the first half of the nineteenth century. It provides an overview of cochineal production in Mexico and its relation to the fluctuations of international prices of this precious red dye. The most complete series are based on data registered at the local treasury of Oaxaca on annual production by weight and value, as well as on annual price trends. The long-term tendencies indicate that physical production declined from the end of the eighteenth century, but that there was a notable price increase during the age of the Napoleonic Wars and later during the wars of independence in Mexico (Fig. 1).

The review of the data suggests a need for a further breakdown from the century-long trend to shorter time periods. Analysis of a first quarter century spanning the years 1758 to 1783 demonstrates that this was an age of prosperity as far as cochineal was concerned: annual production averaged 922,600 lb, which, at a price of almost 20 silver reales (two-and-a-half silver pesos = 10 shillings) per pound, produced over two million silver pesos per year for local producers and merchants in Mexico (the peso was worth exactly one dollar). However, a marked drop in production levels took place from 1784 and took production of cochineal to slightly less than half a million pounds per year until 1803. At the same time, prices declined slightly, hovering at an annual average of some 10 silver reales per pound until the turn of the century, when they began to recover and climb.

That production should have fallen so abruptly after 1784 and continued to remain depressed despite the continuing Oaxaca monopoly of cochineal would seem to suggest that it was the disruption of this complex credit-mercantile mechanism which contributed to the decline of cochineal. Baskes demonstrates the remarkable fall in production after the abolition of the 'repartimiento' schemes and argues that peasants depended heavily on the old credit mechanisms. Other authors have also insisted that additional factors were involved, such as increasing taxation in the final decades of the eighteenth century, but the arguments

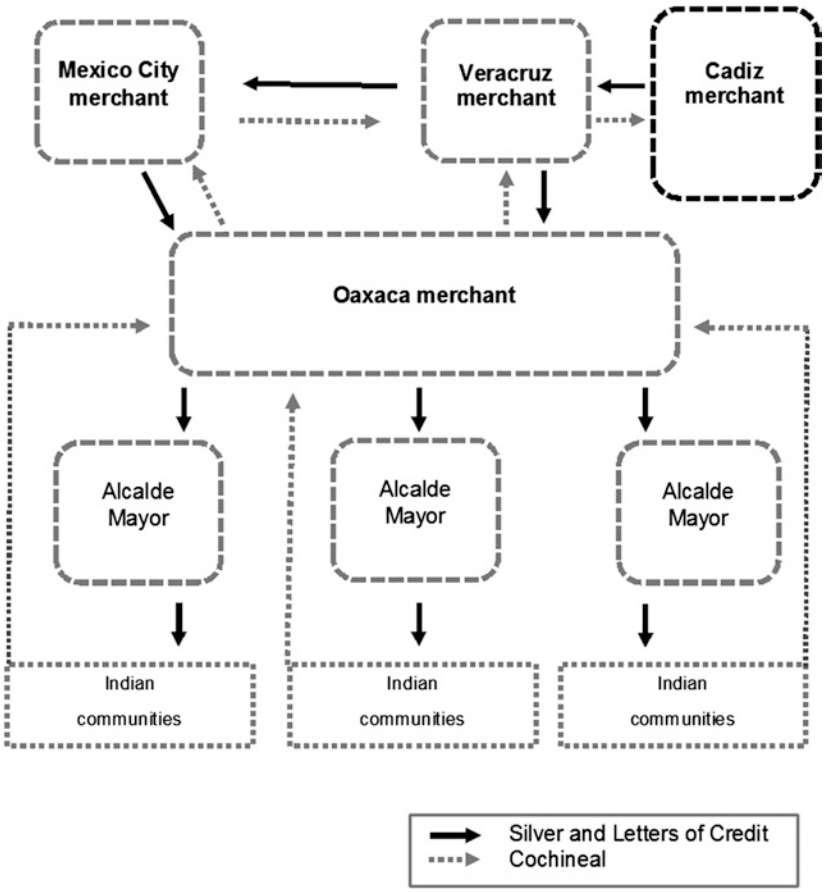

Fig. 1 The cochineal trade: Mercantile networks in Mexico

of Baskes are convincing. At any rate, the subject would appear to merit future investigation.

It is also likely that these trends reflected shifts in the demand for cochineal in Europe, which may been caused by the multiplication of international wars at end of the eighteenth century and first years of the nineteenth century that certainly affected global trade; the recovery of prices was probably related to the decline in Atlantic maritime trade, particularly after the Battle of Trafalgar. In any case, it may be speculated

that expensive scarlet cloth probably lost some favour at the close of the *ancien régime* with the decline in the pre-eminence of both the aristocracy and the Church at the time when the emerging middle classes gained strength as a result of the Industrial Revolution and of democratic revolutions in the USA and parts of Europe, all of which had extensive impacts on consumer patterns.

There were also domestic reasons for the steep reduction in the production of Oaxaca cochineal which were apparently not related to the rather modest price decline, but rather have been ascribed by historians to two causes: (1) the terrible impact of the plagues and demographic crisis of 1784–1785 (during which over 300,000 people died in New Spain), which is believed to have deeply affected the Oaxaca peasant communities and disrupted production; and (2) the impact of fiscal and administrative reforms which restructured traditional forms of commercialization of cochineal locally and, at the same time, implied higher taxes on this commodity (Baskes 2001; Hamnett 1971; Contreras 1996; Sánchez 1998). In sum, a complex series of new conditions—demographic, fiscal, administrative and mercantile—disrupted traditional levels of local production of cochineal in Oaxaca and initiated a phase of relative decadence.

During the following fifteen years, (1804–1819), production of Oaxaca cochineal continued to decline, but was compensated for by the rise in the international price of the dyestuff, which rose to an average of 26 silver reales per pound during these years of war and intermittent interruption of navigation between Mexico and Europe. After the independence of Mexico in 1821, the international price of cochineal dropped steadily mainly because of the end to the Mexican monopoly on cochineal and the emergence of competing production in other regions of the world, in particular Guatemala and the Canary Islands. Despite the fall in prices, it should be noted that the annual production of Oaxaca grana (as measured in pounds) increased, a fact which would appear to suggest that peasant producers sought to maintain income levels by intensifying their labours in spite of the drop in profitability, and they continued to do so for decades (Fig. 3).

2 American Dyes and Their Role in Textile Protoglobalization

The international trade in cochineal was highly complex. Its axis originated in Mexico because the Spanish crown made it policy to foster a virtual production monopoly of *Grana fina* in the region of Oaxaca. But it

should also be noted that New Spain (colonial Mexico) was also important as an intermediary for other American dyes, in particular indigo (some produced in Mexico but mostly in neighbouring Guatemala) and dyes from Campeche wood (palo de Campeche).[5] Indigo was in high demand in Europe for the making of blue cloths, while Campeche dyes were used for deep blacks, which were in high demand for religious reasons in both Catholic and Protestant countries as well as because of fashion, as can be seen in the contemporary paintings of the Spanish court of Philip II of Spain.

The importance of cochineal was reflected in its price, being the most expensive of all dyes. As a result, it often represented a higher proportion of the final costs of fine cloth than other materials essential to their manufacture, including raw or processed fibres, whether wool, silk or linens. But why was this so? Scarcity of high-quality dyestuffs, of course, played a major role in this, but it is also worthwhile underlining that certain colours had great socioeconomic significance in traditional society for the maintenance of hierarchies. In this regard, it is worthwhile recalling that from the medieval era, one of the colours most prized by the crown, church and nobility in Europe for their finest fabrics was that of carmine or deep crimson. It is well-known that from the fourteenth century onwards, the leading luxury textile centres of Europe—particularly Florence and Flanders—produced crimson cloth (in various shades and tones) by using a variety of red dyestuffs. According to the historian John Munro, the 'medieval scarlets' owed their 'splendor, fame and high cost to the dyeing process' (Munro 1983: 39). This was so largely due to the fact that such dyestuffs (particularly derived from insects, such as the *kermes* from the Mediterranean) were quite rare and because the dyeing processes were complex and required considerable technical skill. The expensive scarlet or crimson fabrics could only be acquired by the wealthiest members of late medieval society, but despite their high price, from the early sixteenth century onwards, the demand for luxury crimson and scarlet cloth continued to climb all over Europe, although perhaps most noticeably in England, Flanders, France and Italy. Inevitably, the demand for high-quality and long-lasting red dyestuffs also rose.

From the late 1520s, Mexican cochineal had begun to appear on European markets in small quantities, but soon gained wide acceptance as the finest and most durable crimson dyestuff for textiles, particularly woollens and silks. According to one historical study: 'Cochineal possessed from ten to twelve times the dyeing properties of kermes; it also

produced colors far superior in brilliancy and fastness' (Lee 1951: 61). This dyestuff thus quickly won growing markets in the leading luxury textile manufacturing centres of Europe, including Segovia in Spain, Suffolk in England, Florence, Milan and Venice in Italy, Rouen, and Lyon in France and various centres in Flanders. Interdisciplinary scientific studies provide concrete evidence on the rapid expansion of European demand for cochineal. A laborious chemical research programme on hundreds of samples of medieval and early modern dyed textiles has provided 'concrete evidence to substantiate the historical assertion that Mexican cochineal within fifty years of its introduction into Europe (c. 1520–30) fully displaced kermes in scarlet textile dyeing' (Hofenk-De Graaff 1983: 75).

The luxury textile industries of Italy were among the most important of sixteenth-century Europe and hence were among the major markets for expensive dyes. Substantial quantities of the 'grana cochinilla' sent from Veracruz to Seville and Cadiz made their way to the port of Livorno. The Spanish economic historian Felipe Ruiz Martín used the correspondence of contemporary Spanish merchant bankers to trace the exports to Florence where a booming luxury textile industry consumed large quantities of dyes (Ruiz 1965). But he also noted that a substantial volume of cochineal was trans-shipped from Livorno to Venice, where it was used to dye the cheaper textiles—'pannina'—sent to Constantinople as well as for the famous Venetian 'fez', the religious caps used throughout the Muslim world. According to both Spanish and Genoese merchants involved in this trade, the crimson dyestuff was always profitable and in fact its price quadrupled over the sixteenth century, even as the volume of trade rose rapidly.

The high prices and specialized demand for cochineal probably explain why it appears prominently in the correspondence of international merchants from the sixteenth to the early nineteenth centuries. Moreover, the possibility of cornering the market in cochineal was apparently greater than in the case of the other dyestuffs and hence was generally seen as offering more potential for profit-taking by those in a position to invest large sums in such speculations.

From the mid-sixteenth century onwards, leading European merchants and merchant bankers became interested in cochineal because it was a high-value commodity with low weight; in this regard, it was similar to other leading global commodities of the era such as silks, pepper and spices, as well as precious metals which were easily transportable by

sea or land and allowed for great profits because of their high but fluctuating prices. As a result, it was not strange that cochineal should have become the object of much financial speculation.

Examples abound from the late sixteenth century of attempts to corner the cochineal markets in Europe, including the manipulation of the cochineal trade by groups of leading Spanish and Italian merchant bankers, a number of them closely linked to the finances of the Habsburg monarchy. The historian Ruiz Martín edited a selection of the abundant correspondence of the Spanish merchant Simon Ruiz with Italian merchants, which includes extremely frequent references to cochineal (the mercantile correspondence of Simón Ruiz is among the richest in that of contemporary Europe, including over 6000 letters, now in deposit at the University of Valladolid: Ruiz 1965). Such merchant bankers were engaged in the trade circuits linking Seville/Cadiz, Genoa, Livorno and Florence. Cochineal arrived from Mexico to Seville and Cadiz and from there was redistributed to the rest of Europe. Most of the cochineal which went to Italy went to Livorno (Leghorn) and was transported in the same ships that brought the famous merino wool that was also a commodity much in demand in the Florentine luxury textile manufacturing sector.

The most spectacular speculative operation in the late sixteenth century related to cochineal was that carried out by the Florentine merchant banking family known as the Capponi, who, in alliance with the powerful Maluenda merchant bankers of Burgos, Spain, attempted to corner the entire shipment of cochineal from Mexico arriving at Seville in 1585. They also bought up the bulk of stocks in other European ports in order to reinforce a strategy aimed at gaining a virtual monopoly of the valuable dyestuff. The ambitious plans of the speculators were quite successful and allowed them to push prices upwards, although there was stiff resistance by the artisans in the leading textile centres of Europe. Ruíz Martín notes that in some cases the decline in demand obliged the merchants to offer extended time spans for payment of the cochineal (Ruiz 1965).

The published data and information on the cochineal trade is relatively scarce and scattered for the seventeenth century, but the historian Louisa Hoberman has provided important information with regard to the cochineal trade at this time in her excellent study on the merchants of New Spain. According to her research, on average, it can be estimated that one pound of cochineal would cost anywhere between four and six

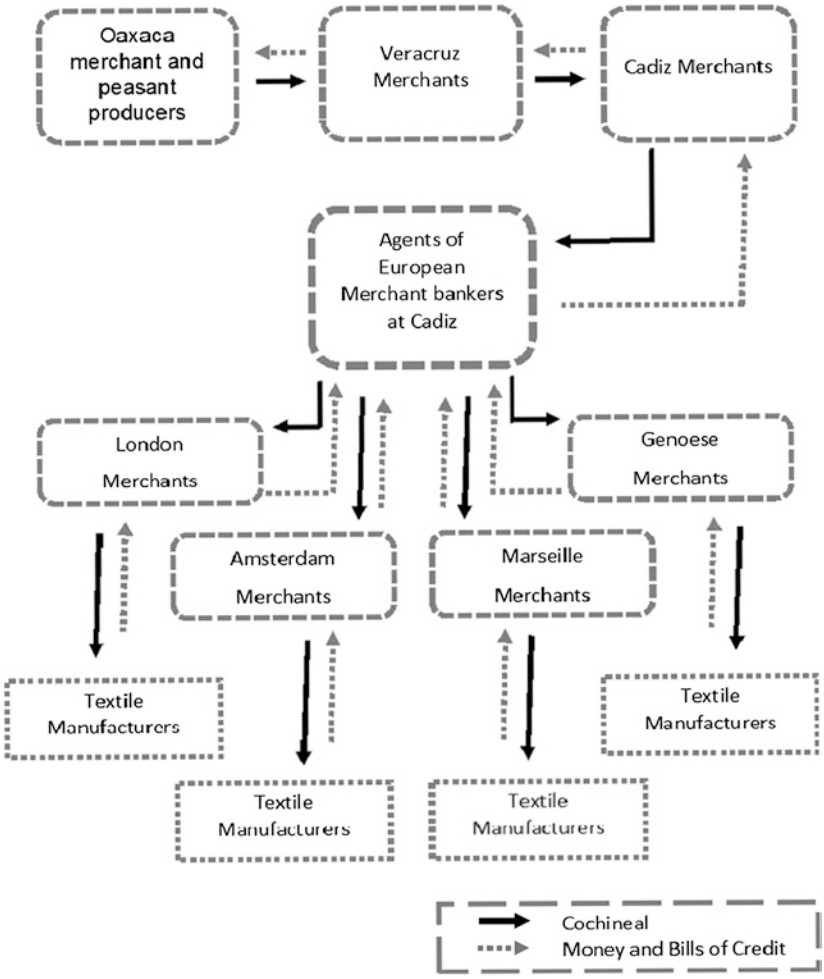

Fig. 2 The Commodity Chain of Cochineal from Oaxaca and Veracruz to Europe, circa 1780

silver pesos in the early seventeenth century. Hoberman adds that the high unit value of cochineal can perhaps be best judged by comparing it to other commodities. In the decade of 1610–1620, for instance, 25 lb of cochineal cost 60 times more than an equivalent weight of sugar; in the 1630 s, cochineal was worth 30 times the value of an equivalent weight of sugar (Schell 1991: 121–122).

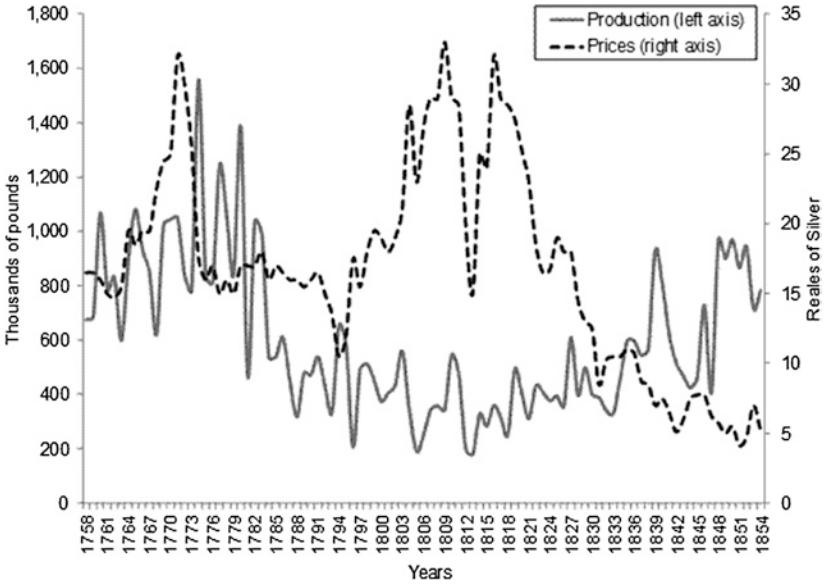

Fig. 3 Annual Production and Prices of Cochinilla Registered at the Oficina del Registro y la Administración Principal de Rentas, Oaxaca, 1758–1854. *Source* Barbro Dahlgren, *La grana cochinilla*, México, UNAM-Instituto de Investigaciones Antropológicas, 1990, pp. 331–332

*There are no values for 1820. It has been averaged using the values of 1819 and 1821

The international trade in cochineal hence became ever more important, but as it remained a Spanish commercial monopoly, practically all of the valuable dye from Oaxaca was channelled via the Spanish port of Cadiz to the multi-faceted European mercantile community, as can be seen in Fig. 3.

A review of the trade in cochineal indicates that speculation continued to be a common feature of the international trade in this dyestuff from the sixteenth century to the late eighteenth century. For example, financial historians have identified the huge cochineal speculation by two of the leading merchant banks of Europe, Hope and Company of Amsterdam and Baring Brothers of London, in 1788. The operation involved buying up most of the stock of cochineal in all the principal European ports—Cádiz, Marseilles, Rouen, Genoa, Amsterdam, London

and even Saint Petersburg—with the object of obtaining a virtual monopoly. The transactions required particular attention to acquiring practically all the dyestuffs received from Mexico in Cádiz, since failure there would condemn the whole, vast transaction. The agent of the bankers at Cádiz was not entirely successful in this part of the project and rival merchants in other ports were also able to buy up substantial stocks of cochineal, probably because they had gotten wind of the aims of the Hope/Baring alliance. As a result, the monopoly was nowhere complete and attempts to rig prices failed, causing substantial financial losses to the main partners in the speculation (Buist 1974).

But European merchants were not alone in the international cochineal business. Some of the great eighteenth-century mercantile firms of Mexico City and Veracruz were also heavily involved in the management of this complex commodity chain on the American side and in its connections to both Europe and Asia. Studies by various historians on the operations of the wealthy house of the Iraeta merchant family of Mexico City reveal the complexity of the control of the cochineal trade inside New Spain, the complex connections to Cadiz merchants those with Asian markets where there was considerable demand for the cochineal which was shipped via the Manila galleon across the Pacific in its long, annual journey, from Manila to Acapulco.

3 Conclusions

It was indeed remarkable that the Spanish crown could have successfully maintained a virtual Mexican monopoly of cochineal production from the sixteenth century up to 1820. Such exclusive control was essential for two aspects of the cochineal business: to guarantee the high quality of the product and to maintain its high price. Precisely for these reasons, the rivals of the Spanish crown expressed great interest in the singular insect and its capacity to produce the valuable carmine dye. It is known that already by the late eighteenth century, the French botanist Thierry de Menonville smuggled some cochineal insects out of New Spain and took them to Saint Domingue (Haiti), where he attempted to promote their cultivation, but without success (Sarabia 1994: 35–36). Less well known is the fact that from the mid-1820 s, cochineal began to be cultivated successfully and on a large scale in nearby Guatemala and in the Canary Islands, and cochineal actually became their leading export for almost half

a century. The results of the increase in cultivation and production of the dyestuff were dramatic, causing a steady price decline per pound. Despite this turn of events, Oaxaca peasants responded by increasing production after 1824, although profitability was falling, year by year, as can be seen in Fig. 1 in relation to price trends. Their strategy to intensify the cultivation of nopal, and cochineal was actually fairly successful in maintaining this export trade in what became an increasingly cheaper crimson dyestuff decades after Mexican independence.

Nonetheless, the Oaxaca peasant communities faced increasing difficulties in the first half of the nineteenth century, for by 1870 the peasants of Canary Islands eventually became the world leaders in the cultivation and harvest of cochineal, producing up to five million pounds a year itself, much more than either Guatemala or Mexico (Butler Greenfield 2005). Yet suddenly, at this time major advances were made in the chemical dye industries in Germany and Britain, and natural dyes were quickly substituted by synthetic ones, leading to a steep drop in prices and demand for natural dyes such as cochineal. Indeed, the steep and abrupt decline of the cochineal trade marked the end of early globalization, as it gave way to a different kind of economic process which we know today as modern globalization, which had strikingly new characteristics.

In summary, the fortunes of these dyes from the New World followed the trajectory of the labour-intensive textile production of the *ancien régime*, which was later supplanted by the age of factory production of textiles. Hence, this is a story of how specialized peasant production in the Americas influenced proto-industrialization and early industrialization in Europe with the expansion of the supply of natural dyes, although later they were replaced by artificial dyes as a result of the triumph of the Industrial Revolution and its new technologies.

Notes

1. The exhibition curators contracted more than a dozen museum experts in chemical analysis of dyes to carry out detailed studies on presence of cochineal in textiles and arts of the early modern period in various countries. See Anderson and Padilla (2015).
2. Much additional information on tributes from different towns of New Spain can be found in Lee (1948: 452).

3. For a recent interpretation of the importance of these commodities on early globalization, which focuses mainly on changes in European consumption and on ideological factors, see Carmagnani (2012).
4. Valuable information can be found on the subject in Lee (1948), 449–473.
5. Some of the material included in this section is derived from a previous essay: Marichal (2013): 197–215.

References

Anderson and Padilla. 2015. *A Red Like No other: How Cochineal Colored the World: An Epica Story of Art, Culture, Science and Trade*, 1st ed. New York: Museum of International Folk Art and Skira Rizzoli.

Baskes. 2001. *Indians, Merchants and Markets: A Reinterpretation of the Repartimiento and Spanish-Indian Economic Relations in Colonial Oaxaca, 1750–1821*. Stanford: Stanford University Press.

Buist, Marten G. 1974. At Spes Non Fracta: Hope and Company, 1770–1815, Merchant Bankers and Diplomats at Work, (The Hague, Martinus Nijhoff).

Butler. 2005. *A Perfect Red: Empire, Espionage and the Quest for the Color of Desire*. New York: Harper Collins.

Carmagnani, M. 2012. *Las islas de lujo: productos exóticos, nuevos consumes y cultura económica europea, 1650–1800*. Madrid: Marcial Pons.

Contreras. 1996. *Capital comercial y colorantes en la Nueva España en la segunda mitad del siglo XVIII*. Zamora: El Colegio de Michoacán/ Universidad Autónoma de Yucatán.

Donkin. 1977. Spanish Red: An Ethnogeographical Study of Cochineal and the Opuntia Cactus. *Transactions of the American Philosophical Society,* vol. 67, part 5, pp. 1–83.

Lee, R.L. 1948. Cochineal Production and Trade in New Spain to 1600. *The Americas* 4 (4): 449–473.

Lee, R.L. 1951. American Cochineal in European Commerce, 1526–1625. *Journal of Modern History* 23 (3): 205–224.

Hamnett. 1971. *Politics and trade in Southern Mexico; 1750–1821*. Cambridge: Cambridge University Press.

Hofenk-De Graaff. 1983. The Chemistry of Red Dyestuffs in Medieval and early Modern Europe. In: *Cloth and Clothing in Medieval Europe,* eds. Harte and Ponting. London: Heinemann. pp. 71–79.

Marichal, C. 2013. Mexican Cochineal and European Demand for a Luxury Dye, 1550–1850. In: *American Products in the Spanish Empire. Globalization, Resistance, and Diversity, 1492–1824,* eds. B. Aram and B. Yun-Casalilla, 197–215. New York: Palgraves Macmillan.

Marten, G. 1974. *Buist At Spes Non Fracta: Hope and Company, 1770–1815, Merchant Bankers and Diplomats at Work*. The Hague: Martinus Nijhoff.

Miño, M. 1993. *La protoindustrial colonial hispanoamericana. El Colegio de México*. Mexico City: Fondo de Cultura Económica.
Munro, John. 1983. "The Medieval Scarlet and the Economics of Sartorial Splendour". In: eds. N.B. Harte and K.G. Pointing. Cloth and Clothing in Medieval Europe, London, Heineman, pp. 13–70.
Ruiz, F. 1965. *Lettres marchandes échangées entre Florence et Medina del Campo*. Paris: Ecole Practique des Hautes Etudes.
Sahagún, B. 1577. *Historia general de las cosas de Nueva España*. Avaiable at: https://www.wdl.org/en/item/10096/view/1/1/.
Sánchez. 1998. *Indios, comerciantes y burocracia en la Oaxaca poscolonial, 1786–1860*. Oaxaca: Instituto Oaxaqueño de las Culturas.
Sarabia. 1994. *La grana y el añil: técnicas tintóreas en México y América Central*. Seville: Escuela de Estudios Hispanoamericanos/Fundación del Monte.
Schell. 1991. *Mexico's Merchant Elite, 1590–1660: Silver State and Society*. Durham, North Carolina: Duke University Press.