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EVIDENCES OF THE INDIGO INDUSTRY IN THE COPAN-CH'ORTI' BASIN

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Etymologically, the word indigo is of Arabian origin and stands for light blue color, while the word jiquilite, or xiquilite, instead, comes from the Nahuatl: Alonso de Molina uses it as *xiuquilitl, and translates it as dyeing cake;* he also uses *xiutil* which means "*year, comet, turquoise and herb"*, while he adds that the name of the blue dye is *texutli* (Rubio 1976:20).Clavijero, in turn, calls it *xiuhquilpitzanc*, and Jorge Luis Arriola indicates that *xi* is the apocope of xihuite, blue, and of *quitiel*, herb, and that therefore, jiquilite is *a herb that provides a blue color* (Rubio 1976: 20-2).

In consulting earlier sources, Sahagún grants it a name consistent with the one known nowadays, which is definitely Nahuatl; the friar indicates that the *xiuhquilitl* grows in the warm lands and explains how the colorant is obtained. Francisco Hernández names it *xiuhquilitlpitzahoac,* or *tenuifolio indigo* or *herbaceous vegetable*; it is known that the Otomi called it *pame pitzahoac*, and therefore it is assumed that Hernández blended the Nahuatl and the Otomi names. In Guatemala, according to Ximénez, by the mid XVIII century it was already known as *xiquilete*, thus suggesting that the Nahuatl name was popularized in the entire region (Hernández 1959:112, Rubio 1976: 20-21; Turok 1993:30; Ximénez 1967:248).

There has been plenty of speculation about the provenience of indigo, with some authors attributing it an Asian origin and some others a Central American one, as the higher ancestral cultures (Indian, Egyptian, Roman and Mesoamerican) profusely used indigo or indigtine, the dye obtained from the processing of some *Indigofera* species. In fact, the species makes the difference; *Indigofera tinctorea* is a native of southern India, while *Indigofera suffruticosa* Mill. *(Indigofera anil* L. or *Indigofera guatimal* Lunan), and *Indigofera guatemalensis* Monc, are American plants (Standley and Steyemark 1946:270-272).

Knowing that there was one indigo species which was being processed in Europe prior to the contact, it was assumed that the Spanish had brought it with them; however, there is prehispanic archaeological and ethnographical evidence that contradicts the Spaniards' beliefs. In the cave of La Garrafa, Chiapas, the huipil of a girl was recovered together with a blanket and a shirt, as well as several linens dated to the end of the XV century and the beginning of the XVI. The huipil was dyed blue,

with a hue that was consistent with the indigo tone, thus reinforcing the notion of its prehispanic use. Other scholars have argued that the blue Maya color of murals and vessels is a combination of indigo with Attapulgus clay (aluminium silicate and magnesium; Sax and Lewis 1993; Turok 1996:29).

The Chilam Balam explains that whenever the characters included in the narration are suffering, the fact is expressed with an indigo-dyed body. There was also a detail included in Landa's work: the participants of fecundity rites would smear their bodies with a blue indigo paste called Ch'oh, which is the name still given to the plant in the Yucatecan tongue (Rubio 1976:19). The earliest reference among the chroniclers was the one provided by Hernando Colón, son of the Admiral, who arrived in America in 1502 and 1509; he described indigo as a plant typical of La Española (Rubio 1976:15). Later, Sahagún and Hernández made it abundantly clear that the prehispanic cultures from Central Mexico were already processing the plant.

Like we said before, Hernández used the term xiquilite for *xiuhquililpitzahoac,* and argued that with this plant the natives produced a blue colorant known in prehispanic languages as *tlacehoili* or *mohuitli that gives the hair a black dye*. Like the great expert he was in Spanish herbs, he never compared it with the indigo known in the Old World, something he customarily did whenever he found any similarity between both the European native plants and those included in Plinio. Moreover, he described it as "a herb that lasts two years green and healthy, born in warm, rustic and mountainous places, and recommended that it was taken to Spain to grow it in similar lands, such as those of Andalucía, or in regions bathed by the sea, and to create seedbeds to culture them" (Hernández 1959: 112-113).

Two centuries later, and when the colorant production was at its peak, Humboldt came to América; during his stay in México he compiled valuable information on every nature-related subject, stating that he was informed that the plant was used to paint the codex, and that the Spanish, still 30 years after their arrival, used it like ink, as they were unable to find the adequate ingredients to prepare the one they were used to (Rubio 1976:15).

Botanically, the origin of a species is assigned to the place where more species or surviving varieties of a plant are found (Turok 1996:30). Guerrero, México, possesses today 10 *Indigofera* species, it is the place of origin of the American species, and define spreading routes towards Oaxaca (9 species), Michoacán (8 species), and both the states of México and Morelos (7 species).

BOTANIC CHARACTERISTICS OF THE JIQUILITE

The *Indigofera suffruticosa (I. añil or I. Guatemala)*, and *Indigofera guatemalensis*, are both plants that in general possess common names, such as añil, jiquilite, or xiquilite, although across the entire Mesoamerican area they are known with the synonyms of *tinto, platanito, tinaco, añil de piedra* (Petén)*, barbasco* (Huehuetenango)*, sacatinta, añil colorado, añil montés, hierba azul, platanillo, jiquelite, huiquilitl, aceoitli, mahuitli, tlacecoitli, xiuquilitl, pitzauac.* In Yucatec Maya,

the name is “ch’oh’, or “chan”, which means turquoise herb (Martínez 1990:38, 564: Stanley and Steyemark 1946: 270-271).

These jiquilite species grow in Guatemala (Petén, Alta Verapaz, El Progreso, Izabal, Zacapa, Chiquimula, Jalapa, Santa Rosa, Escuintla, Guatemala, Sacatepéquez, Suchitepéquez, Sololá, Jutiapa, Quiché, Huehuetenango and San Marcos); El Salvador (it practically grows throughout the country though the larger producer areas are San Miguel, Chalatenango, San Vicente, Cabañas and Cuzcatlán); Honduras (Tegucigalpa, Choluteca and Valle); Nicaragua (Chinandega, León, Managua, Masaya, Rivas, Carazo, Granada); Costa Rica (practically it was specific of the Nicoya *corregimiento*); and the Caribbean. During his visit to Guatemala, Mociño documented that the plant was present along the Pacific coast, in large latifundia found from Escuintla (Guatemala), to Rivas (Nicaragua; Clará 1975:773: Maldonado 1992:82; Rubio 1976: 22-23; Standley and Steyemark 1946:270).

Standley and Steyemark define indigo in the book *Flora de Guatemala* as a graceful and slim shrub, 1 m to 2.50 m tall, with little oblong and oval leaves 1 to 3 cm long; it has small, greenish or yellowish flowers and fruits 1 to 1.50 cm long (Standley and Steyemark 1946: 268, 271).

THE USES OF INDIGO

Indigo was a colorant, but it was also a medicine. As a colorant, Hernández notes that it was used to dye clothes, fabrics, feathers, fibers and the hair, in black. As to its medicinal uses, many of them are of prehispanic tradition, and have persisted to modern times. Shogun, referring to the feminine markets and habits, said that they would *“smear the head with some herbs they called xiuhquilit which are good to fight capital diseases”*, or in other words, diseases of the head. Hernández notes that the powder cured old ulcers, if previously washed with urine: *“leaves are crushed and applied, or else dissolved in water and smeared to ease the pain and extinguish excessive heat from the head of children”.* In the latter case, the use is very similar to that recorded by Sahagún.

In more modern references, such as those of Maximino Martínez in *Las plantas medicinales de México* and Standley and Steyemark in *Flora de Guatemala*, it is said that the jiquilite is good for curing the bite of bees and other insects, and for reducing the pain of swelling, though its efficacy was at times uncertain. As a beverage, it cures indigestion. Traditionally, the leaves were used in poultices or brews, applied to ease the pain and the excessive heat in the head of children; the powder of the seeds is used to cure ulcers and together with that of the root, to kill lice. It is also used as an antispasmodic, mostly in epilepsy, and as a laxative. Elsewhere, it was used for the treatment of intestinal colic and against madness (Martínez 1990: 38-39; Stanley and Steyemark 1946:271).

DOCUMENTAL EVIDENCE ON THE INDIGO PRODUCTION

Undoubtedly, the indigo colorant was produced in prehispanic times, because both Sahagún and Hernández describe a method for extracting the substance, and in addition, they provide the prehispanic names of both the plant and the dye. However, and regarding the method of extraction, it is the protomedic who provides the more detailed information on the matter. According to his observations, what he is describing is definitely a handcrafted –prehispanic- technique for its preparation: *"the leaves are cut into pieces, then they are put into a cooking pot or boiler with boiled water previously removed from the fire, and tepid, or better yet (as noted by experts) cold and without having been subjected to fire… shake vigorously with a wooden slice… gradually empty the already dyed water in a clay vessel or jar, allowing for the liquid to pour out through some holes present at a certain height, and the product derived from the leaves, to rest. The sediment is sun-dried, strained through a hempen cloth, and given the shape of little round slices that are hardened by placing them in dishes and on embers. They are kept in storage and used for an entire year"* (Hernández 1959: 112-113). Actually, this method is quite similar to the one semi-industrially implemented in the years following the colonization.

Sahagún has very briefly described how indigo was obtained (Rubio 1976: 20-21; Turok 1993: 30): *"they dip the herb and squeeze its juice, and they put it in glasses where it dries or sets; with this color one may obtain a dark and resplendent blue dye, it is a precious color".* However, the *Historia Natural del Reyno de Guatemala* by Fray Francisco Ximénez (1622) already included a description –brief, though- of the indigo extraction with the semi-industrial, colonial system. It reads: *"they obtain it by leaving the herb to soak, and then they whip that water, and once it is ready, the ink is set by adding a bit of water, in a pot that previously contained, in soaking, the leaf of a tree known as tiquilote. Then everything is laid on the bottom of the trough, and once the water is extracted they take it out in the form of mud, and put it to distil in strainers, and then it is sun-dried, with no additional benefits"* (Ximénez 1967: 248).

Admirably, Francisco Antonio de Fuentes y Guzmán, who was expected to provide valuable information regarding the indigo production, wrote only a brief paragraph in his entire work. Nevertheless, the paragraph present in the section corresponding to Chiquimula de la Sierra, seems to say that towards the end of the XVII century, the production of indigo was limited in said region, although he mentioned that quality was good and that market prices were good as well; in addition, he noted that indigo was also produced in Guazacapán and Escuintla (Fuentes y Guzmán 1933:221). *"Although in small amounts, the indigo dye is manufactured in a limited number of mills, and this indigo ink, together with another one they call flower, is picked and exploited in this noble territory with great cleanness and without adultering its manufacture; as well as the very improved and stronger one manufactured both in Goazacapan and Yzquintepeque, for in cut and color, those from the three countries mentioned, are ahead in quality and great substance, and their price is also higher…".*

An indication that indigo would reach a peak in world markets is present in the short paragraph of the *Recordación Florida*, confirmed by Rafael Landivar in his *Rusticatio*

Mexicana (1782); for this reason, he devoted the totality of Book V of his work to the description of the plant, the process of sowing, growth and harvest and the production of the indigo dye, which was by then at its peak.

It is common knowledge that Guatemala was a place rich in vegetal resources, samples of which were requested in Spain through royal letters patent. Particularly important were the fine woods (cedar, mahogany, blackwood, brazilwood, redwood, guaiacum, mangrove, etc.), fruits, medicinal herbs *(palo de la vida, colpachi, contrahierba, canchalagua, calaguala,* among others), rubbers, the very precious balms (turpentine, *leche de María*, *sangre de drago,* liquidambar), and countless other products such as cardamom, annatto, vanilla, cacao and indigo, but it was around the latter that the Guatemalan economy during the XVIII and XIX centuries was sustained. The Central American indigo saw periods of large demand from European markets, given both the quality involved and its availability, and along those centuries, it supplied almost the entire textile industry in Europe (Maldonado 1992: 57, 82).

However, by the end of the XVIII century, the Guatemalan indigo initiated a clear decline, due probably to a variety of reasons, among which are the following:

- Communication difficulties between the Old and the New Worlds, caused by a naval blockade as a consequence of the war between Spain and England.

- Competition interposed by the English, French and Dutch colonies against the Spanish monopoly in the world market of dyes.

- The Industrial Revolution, which represented great progress in the textile industry, with the subsequent increase in the production of other dyes (logwood, cochineal, cardamom), and later, the incorporation of synthetic colorants.

Nonetheless, it should be emphasized that growing indigo represented great progress in Guatemala, in addition to the economic benefits, as it involved a true scientific interest among the most important scholars of those times. When indigo suffered periods of productive and commercial decay, it became the major object of attention in the region and all efforts concentrated on defining how productivity and profits could be boosted once more; in addition, studies were accomplished for improving the elaboration of indigo ink at the wood mills, for finding a solution to the existing problems, and even, for attempting the passing of a legislation that would balance the processes of production and trading of the product; it was then that the Scientific Expedition to the Kingdom of Guatemala arrived.

This expedition arrived following orders from the Crown, from Spain to Mexico originally, to later expand to Central America and the Caribbean islands. This expedition was timely joined by the Mexican botanist José Mariano Mociño, who played a crucial role in the scientific circles of Guatemala and the provinces. Mociño paid attention to the indigo issue since he first arrived in Guatemala, and he put himself at the service of the Royal Economic Society of Friends of the Country *(Real*

Sociedad Económica de Amigos del País) to share his investigations and the news of whatever could be of interest regarding this subject.

From Chinandega, on May 6, 1797, José Mariano Mociño transmitted to Jacobo Villaurrutia (chairman of the Society) the first investigations based on the rules of hydrostatics –the study of fluids equilibrium- and on the procedure found by him to solve that which the harvesters thought unachievable: the point for indigo. This is the precise moment when the solution with the colorant should cease to be whipped; based on his backgrounds, one individual was appointed for the task and he was the one that decided when the solution was finally ready.

Together with his letter, Mociño submitted a report indicating how to proceed in the maceration and whipping containers, to reach the optimum degree of the resulting dispersion: likewise, he explained how to establish this degree with the help of a hydrometer and included the corresponding drawing; he asked Villaurrutia as well to send this report to the adequate persons for examination, and in case his work it was considered to be relevant and useful, he was to distribute it among the harvesters so that they could make use of it (Maldonado 1992:83).

This report was published by the Economic Society in the Second Public Conference, on July 9, 1797. However, Bernardo Dighero, the Society's auditor, conducted several experiments after Mociño's guidelines, unsuccessfully. This was communicated to the naturalist, who acknowledged the mistakes he made in his own appreciations, judged them to be hasty, and tried to rectify them. Since then and all along his journey, in different indigo plantations he conducted additional tests to improve his method, an experience he later would use to develop a manual on indigo growing and the obtaining of the colorant.

Upon his return to Nueva Guatemala, he completed his work with data provided to him by Vicente Cervantes, another member of the original expedition from México. The final document, the first scientific work about indigo, was denominated *Tratado de xiquilite y añil de Guatemala*. This treatise was dedicated and presented to the Society by the end of May, 1798. The subjects dealt with involved the origin of indigo in the world (all the species and varieties that produced the dye were included), the more suitable edifice and climatologic aspects for growing xiquilite, together with the agricultural cultivation and harvesting processes; he made particular emphasis on the process for obtaining the dye, contributing with innovative recommendations that largely amended the errors detected previously. An additional major contribution was the attention he paid to the plagues of locusts that affected the sowing fields, the hygiene in the mills, and the chemical and medicinal properties that the plant possessed (Maldonado 1992:84).

The work as such was sent to José Antonio de Liendo y Goicochea, who besides being the most qualified member of the Economic Society and an eminent professor at the University, was probably the most relevant scientific personality in Guatemala at that time. Goicochea's mission consisted in examining the work, its possible correction and the inclusion of additional information, if necessary. Goicochea made several observations, included some notes and wrote the foreword. Mociño was never to hear about this analysis because by the time it saw the light, he was already

on his way from Guatemala to México and then to Spain. Goicochea described the *Tratado* as, *"wise, extremely useful and worthy of the public light it aspires to; it is the first, the only and elemental one written in this kingdom".* The Economic Society finally published his work and sent two copies to the Consejo de Indias in December, 1800, for their information and corresponding judgment (Maldonado 1992:85).

One additional work that mentions several elements on the subject is that of M. Luciano Biart, who wrote *Les Aztéques* in 1885 providing a short description of the way how the ancient Aztecs manufactured indigo: *"they dropped the leaves one by one in a glass full of tepid water, then after an extended removal of the liquid it was left to rest, they extracted the water from the glass with the outmost care, right away they took the basin out, under the sun, and finally they heated it for hardening".* This is a technique similar to that described by Hernández, so it may have been taken from there, as at that time the publications of Nardo Recchio and the adaptation of Francisco Ximénez, in México, were already available. However, his investigation may have allowed him to reach such a conclusion (Hernández 1942:132; Rubio 1976:17).

In general, it is known that during prehispanic times not only vessels were used but also troughs or canoes, and that it was the Spanish who introduced the "industrial" way for extracting the dye using troughs or large troughs built with masonry, placed in open spaces they later called mills. In this new industry, the workers replaced the wooden slices to move the leaves and branches of the jiquilite. Workers now worked in the trough, they had to move the water and stay inside for hours, disregarding the inclement weather.

The mill consisted of a set of several troughs, depending on the size of the industry, some of them communicated with one another, plus one or two basins where the final part of the process of colorant obtention (filtering and purification) took place. The types of mills documented are as follows (Lorenzo Amaya, personal communication):

- Large Trough Mills: structures with one single large trough; there are but a few, because the Crown banned them and ordered their destruction. In El Salvador, there are several poorly preserved samples.

- Royal Mills: structures consisting of three troughs placed in tiers; most of the remains are of this type, though they are completely deteriorated.

- Hydraulic Mills: they correspond to the large indigo *haciendas*; there are complexes that include five to seven troughs of a considerable size, as well as one gutter for the hydraulic wheel.

To describe the arrangement and function of the troughs within a complex, we shall use as an example one Royal Mill with three troughs (Clará 1975: 784-794; Chinchilla 1975: 475-476; Rubio 1976: 319-321; Wisdom 1940:183: Marcelino and Pablo Amador, personal communication).

- Trough 1: it was located in the vicinities of a water source (river, mouth, irrigation channel or ditch). At the trough, the workers put 30 to 40 loads of jiquilite (until a height of some 0.60 was reached), and on top of them, they placed a grid made of branches, planks and stones, to fix the leaves. The *zacateros* were the workers in charge of cutting and transporting the jiquilite to the mill, and helped in the maceration process with constant movement. Maceration approximately took from nine to 24 hours, and was the result of putting in contact the leaves of the plant with a sufficient amount of water, which could be cold or tepid, with or without sulphur. Between trough one and trough two there was a pass denominated *bitoquera* (sewer), which prior to initiating work was filled with a clay or wooden plug (as a seal), called *bitoque* (cock).

- Trough 2: Once the maceration of the jiquilite was completed, the cock was broken and the liquid, denominated lye, contained in trough one was transferred to trough 2. This lye was to be beaten, a task accomplished by two people, the man in charge of the trough and an assistant. Work consisted in moving the dyeing solution with the help of two large wooden slices or rows, with enough vigour to form waves that in turn produced foam. This led to the oxygenation of indigotin. The first foam produced was of a bluish-yellow color, and when it turned to blue and the solution looked clean, almost transparent and of a purple color, the “point” of indigo had been obtained, a fact that was established by the leading man. In that moment agitation was interrupted allowing the dye to rest; the term used was “whipping must coagulate”. Indigotin needed two hours to settle, and then the second cock was broken tough little by little, to prevent that the liquid swimming on top was transferred to the colorant: this water was not collected, but poured in the environment.

- Tank or small trough: the decanted dye was manually transferred with the help of *guacales* (gourds) from the second trough to the tank, and on top of it, pitchforks were placed to mount a fiber strainer whose purpose was to remove the large particles from the remaining liquid containing the dye, like leaves, stones, or any other contaminating product.

To reach the process of purification and drying, the dyeing solution was left to rest for one day, and then it was received in filters made with cloth or raw linens that hanged from hangers. It was left there until water had completely dripped. Then, the mass with the colorant was given the form of cakes and placed on some planks where they dried under the sun for four to six days. The mass of the dye could also be pre-dried first in a pot over a fire to thereafter follow an identical procedure. The cakes were formed with the bark of a gourd *(guacal or tol)* or with a previously emptied banana bunch, and once they were dry they were taken to the market in bags, boxes, pouches, etc.

The material used to build the mill troughs in the XVII century was stone masonry (lime, volcanic tuff and stone). However, Wisdom, in *The Chorti Indians of Guatemala,* presents a different insight in regard to the construction materials. First, he refers to troughs that were made in a simpler way, indicating that two quadrangular holes were excavated in the ground, one by the other, separated by a

thin layer of earth; the length of each tank was of approximately 1 m, but they were differentiated in their depth, as the first measured slightly less than 1 m while the other had 0.60 m.

The sewer that communicated both troughs measured some 0.05 m in diameter, and was 0.15 m above the base. The inner surface of both tanks was plastered with clay and featured a rim of the same material in the upper portion of the walls. This plaster was to be completely dried out under the sun, each time the tank was used (suggesting it was damaged during its use and had to be repaired before being sent back to production). However, and after completing this description, Wisdom notes that in Jocotán, the *ladinos* built tanks with concrete and stone mortar.

An additional aspect that differentiated the colonial industry of indigo, besides the production capacity of the mills, was the quality of the dye (Clará 1975:792; Rubio 1976: 33-34; Rubio 1976:319); in this regard, four classes have been identified:

- *Corte*: the most common quality, tending to the opacity of the reddish-dark blue or copper, and a hard paste that did not float on the water. When it was cut, one could feel the cutting edges.

- *Sobresaliente:* middle quality, less compact, and when floating, only a minimum portion of it emerged from the water. The color was a lesser bright blue than that of the Flor quality.

- *Flor:* top quality, famous for its bright blue color and because it could be reduced to a thin power very easily, simply by floating it between the fingers. This quality was obtained when the jiquilite was left for the right time in maceration and when the solution of the dye obtained was not excessively beaten.

- *Flor Tizate:* extra fine quality, the one produced the less.

THE EVIDENCE OF THE COLONIAL INDUSTRY OF INDIGO IN THE COPAN-CH'ORTI' BASIN

The *Historia del añil o xiquilite en Centro América,* written by Manuel Rubio, is the most comprehensive documental investigation on the indigo industry in Guatemala and El Salvador. Nonetheless, it included very little information about Chiquimula, in addition to data concerning an auction of jiquilite plants which took place in the jurisdiction of the ancient Corregimiento de Chiquimula de la Sierra; the provenience of each indigo load was mentioned, as well as the quantities offered and the amounts of money received for the merchandise; one interesting piece of information in Rubio's work has to do with the places where the plant was grown, such as San Juan Ermita, San Juan Camotán, Santiago Jocotán, Santa Elena, San Esteban, San Luis Jilotepeque, Chiquimula, Santa Catalina Mita, Mita and Ipala; therefore, all these places were a part of the corregimiento (Rubio 1976: 55-57).

An additional work which provides interesting data about the indigo industry in Chiquimula is that of Charles Wisdom in 1940, where he in fact explained that Jocotán was one of the richest production centers. Wisdom's elderly informants told him that during the peak of indigo, Jocotán was a very large town and that the indigo plants were everywhere, even in the highest parts of the mountains. This information makes it possible for us to understand that the colonial indigo industry was extremely prosperous in this part of Eastern Guatemala. This fact is also reflected in the remains of the tanks for the xiquilite processing found scattered across the floodplains of San Juan Ermita, Jocotán and Camotán, as well as in the remembrances of the elders who narrated than when they were children they worked at the mills where the dye was produced, or saw the Ch'orti' females dressed with indigo dyed costumes.

The costume that Ch'orti' women wear nowadays is widely known. It is a costume made with fabrics of bright colors and multiple combinations, adorned with flights and ribbons. However, this colorful costume is recent and has absolutely nothing to do with the costumes they used at least up to the 1930's or 1940's, when Wisdom conducted his research, and which is still remembered by the old men over the age of 70 who lived in Jocotán and Camotán.

Wisdom referred that indigo was not used to manufacture textiles, but to dye the costumes once they were finished. In describing the female costume, he said that women used white cotton blouses, but that skirts were woven in the manner typical of Western Guatemala. This was a piece of fabric 1 m wide, that was rolled around the waist, from backwards to forwards, and held by a knot at one side (Figure 1). In addition, Wisdom described a second female costume made with the same material but tightened to the waist in the way the ladino seamstresses did, like men's trousers, that is to say, with a belt. According to Wisdom's male informants, this costume had just been introduced from Queltzaltenango (Wisdom 1940: 115-116), and may be appreciated in one of the photographs shown in his work, where a woman takes a rest in the step of a house located in one of the Olopa streets.

Figure 1. Ch'orti' female costume, 1930's (after Wisdom 1940:115).

It would seem that this costume is the one that finally became predominant in terms of form, although it changed radically with respect to the type of fabric used today; this variation may the product of the late part of the indigo industry. There is evidence that both the costume and the indigo production were mutually dependent;

that which has not been established with an absolute certainty is whether the costume disappeared because the production of indigo was interrupted and women were forced to find a different material to make their costumes, or if on the contrary, when the use of this costumes disappeared, the need to produce the dye ceased to exist.

Jocotlán has two important places for this investigation: the first is the spa of El Brasilar, known by locals and tourists as Agua Caliente; the second is a store that sells sewing materials, in charge of the sisters Alicia and Natalia Casasola, commonly known as “Las Cotías”, because their mother’s name was Clotilde Solís de Casasola, or plainly “doña Cota Solís”.

El Brasilar is presently owned by the Amador family, and a family assembly is in charge of managing the tourist resort as well as of taking care of its maintenance. Whoever has the chance to merge in the thermal waters of El Brasilar, will probably ignore that he or she is taking a bath in the ancient troughs of a hydraulic mill and that they are an even more important place because they were the last of the industry in the region and probably in Guatemala.

In 1952, Marcelino and Pablo Amador were very young (today they are over 70 years old); they were the great-grandchildren of Antonio Amador, owner of the last indigo mill in Chiquimula. Antonio Amador arrived from El Salvador in 1884, bought the finca and established a processing plant in his lands, trained his sons, grandsons and great-grandsons in the art of transforming jiquilite in a dye, and they were the ones that produced indigo for the last time, early in the 1950’s.

The final annual amount was of 3 pounds only, and were packed in small cloth sacks and taken to the store of Lorenzo Casasola and his wife, Cota de Casasola, in Jocotán; there, in the Sunday markets, they were bought in small cartouches by women who used them to dye the white cloth they were going to use to make a new costume or to renovate the worn out ones. “Las Cotías” were very young in those days too, but they are perfectly aware of the fact that their father, Lorenzo Casasola, was responsible for dressing all the Indian women in the surroundings. Once a year he would go to Baja Veracruz to order the fabric; there, it was woven in a loom and then sent to Jocotán. The fabric arrived white in the store, where it was kept until the indigenous women had the means to buy it. The Señores Casasola in turn contracted the indigo production in Camotán, and the girls (“Las Cotías”), took care of packing it in small cartouches so that they could be sold at their store.

Once the father of the Casasola family passed, his wife maintained for a short while the business of the fabrics and the dye, both with Baja Verapaz and Camotán. It is at this point that the story turns fuzzy. It is possible that as a woman without a husband, in those times, it was very difficult for her to keep in touch with the fabric supplier, but it is also possible that the colorful costume of today had already prevailed over the indigo woven costume. It would seem that jointly, the indigo industry and the indigo blue costume of females disappeared of the Copan-Ch’orti’ basin, and consequently, the ethnological and industrial landscape became forever changed in Jocotán and Camotán.

When Antonio Amador established his mill in Camotán around 1884, the indigo industry was still a major activity in the region; the previous year, Guatemala still exported 135 quintals of indigo (Standley and Steyemark 1946:271). Finally, even the troughs of El Brasilar remained abandoned and the cycle of this colonial industry came to an end. When Wisdom worked in Jocotán in the early thirties, he reported that the remains of the troughs were present in all the house yards, where they were used as pigsties for the pork.

In El Salvador, anyway, a minimum part of this industry survived until rather late among the Chele communities; these groups ceased to produce indigo at a large scale in 1945, but they still produced small amounts up to the beginning of the seventies (hamlet of Los Henríquez, town of Nombre de Jesús, department of Chalatenango; Lorenzo Amaya, personal communication; Clará 1975). When armed struggles got worse in El Salvador and mainly in the regions of Chalatenango, the production of indigo was discontinued.

Referring once again to the evidence of Chiquimula, the subject of concern in this investigation, it may be said that throughout the different field seasons conducted by the Chiquimula project, there was an interest in documenting the vestiges associated with the colonial production of indigo in the Copan-Ch'orti' basin, and therefore, this was one of the objectives for December 2003. While investigating the archaeological evidence of the troughs, specifically in the municipalities of San Juan Ermita, Jocotán and Camotán, we succeeded in finding seven mills.

According to their distribution, four of them were located in San Juan Ermita, one in Jocotán and the remaining ones in Camotán and all were of the royal type, with the exception of one from Camotán which was of the hydraulic type. In Carboneras, Esquipulas, two tanks were observed by the project researchers, but were not documented because at the time, the prehispanic evidence was the priority of the field season.

The troughs were built with stones and cemented with mortar. There is evidence showing they were covered with mortar or masonry, in the way Wisdom indicated. Most of them featured a good preservation, though other troughs have given away to the action of time, and are now partially destroyed. In one of the mills it is no longer possible to elucidate which were the modifications accomplished on the original troughs.

The mills documented in the Copan-Ch'orti' basin are the following:

- *Lemus I, San Juan Ermita* (Figure 2). This mill is of the royal type, and is owned by Ramón Lemus; it was located in coordinates 16º 23' 87.5" E and 16º 33' 05" N (597 m above sea level). It consists of two large troughs and a basin. The first trough used for maceration, included the connecting cock with Trough 2, but the faucet to drain the latter was not found, as the end of the trough was found collapsed on the ground. The end of Trough 2, which abuts Trough 1, showed a descending tier.

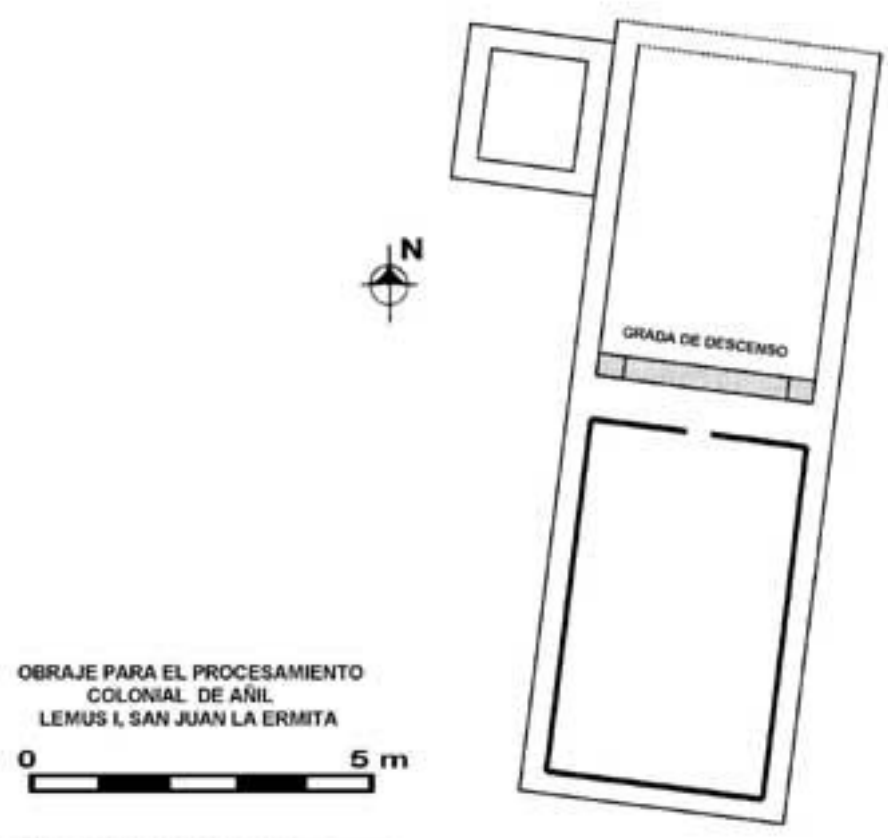

Figure 2. The Lemus I mill.

- *Lemus II, San Juan Ermita* (Figure 3). This mill consists of two sets of sinks of the royal type. The land is owned by Jesús Lemus. The troughs for maceration and whipping are quadrangular in shape, although, as opposed to other mills, the basin has a circular and not a quadrangular base, like in the other cases. It may be said these are the best preserved troughs among those found, as it was even possible to find a portion of the respective floors.

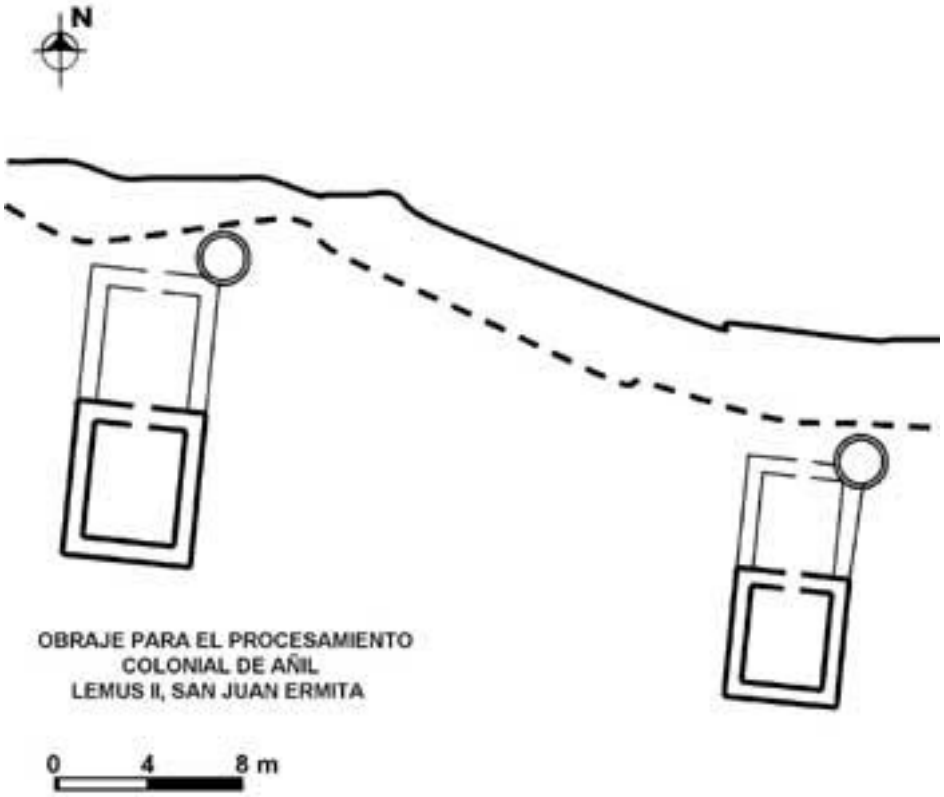

Figure 3. The Lemus II mill.

Figure 4. Mill El Nisperal

- *El Nisperal, San Juan Ermita* (Figure 4): Owned by Vicente Morales, it is of the same type of the previous one and is located in coordinates 16º 23' 34.5" E and 16ª 34' 14.7" N. It was in a good state of preservation. The first trough included an entrance and draining cock to the second trough, while the cock of the latter, to the outside, could be observed on the wall of the second trough that abuts the first; there were two descending steps instead of one, like in the Lemus I mill.

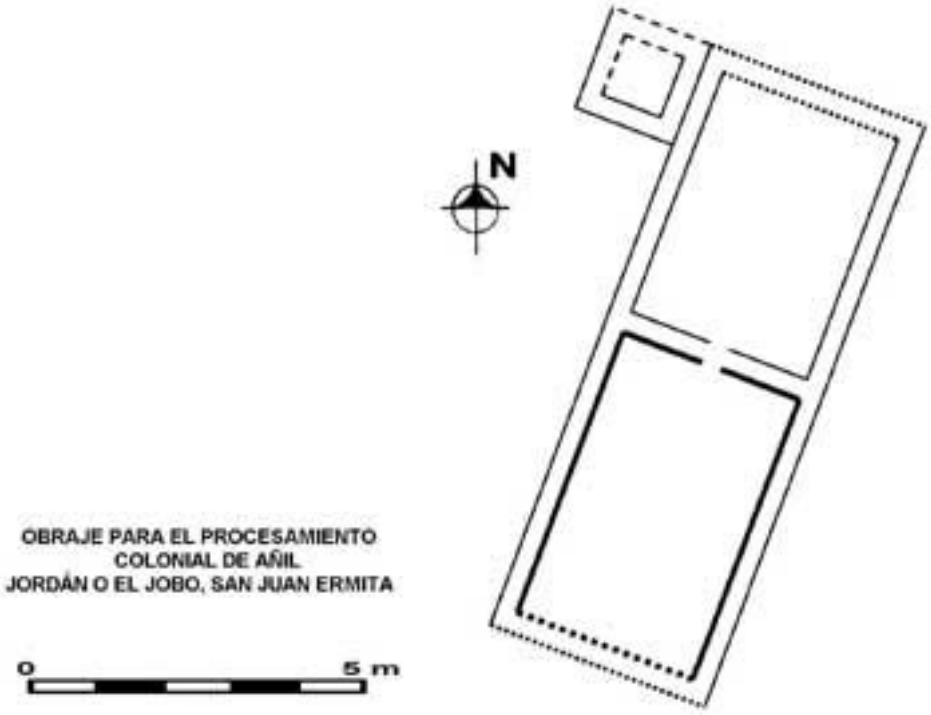

Figure 5. El Jobo or Jordán mill.

- *Jordán, San Juan Ermita* (Figure 5): Also known as El Jobo, the land is owned by the Humberto Jordán family and is located in coordinates 16º 23' 87.9" E and 16º 33' 37" N (598 m above sea level). It is also of the royal type. The basin was collapsed, so its dimensions were approximately established as of the remains found. As it was located in the lower portion of a hill, the troughs were clogged due to the weathering action. The cock from trough one to trough two could be observed, but that was not the case with the draining tap. It neither shows steps in the wall that abuts Trough 2 with Trough 1, like in the other cases mentioned above.

- *Río Carcar, Jocotán* (Figure 6): This mill is located right at the south end of the river with the same name, on highway CA-11, in the vicinities of the modern entrance to Jocotán, in coordinates 16º 24' 30.4" E and 16º 39' 27" N. Part of the mill was affected by the construction of the new stretch of the road. It consists of two sets of royal type troughs, not too well defined; one of these groups was covered with the material removed to build the road, and the second with clogging, due to the land sliding that occurred in the upper portion of the land where it is located.

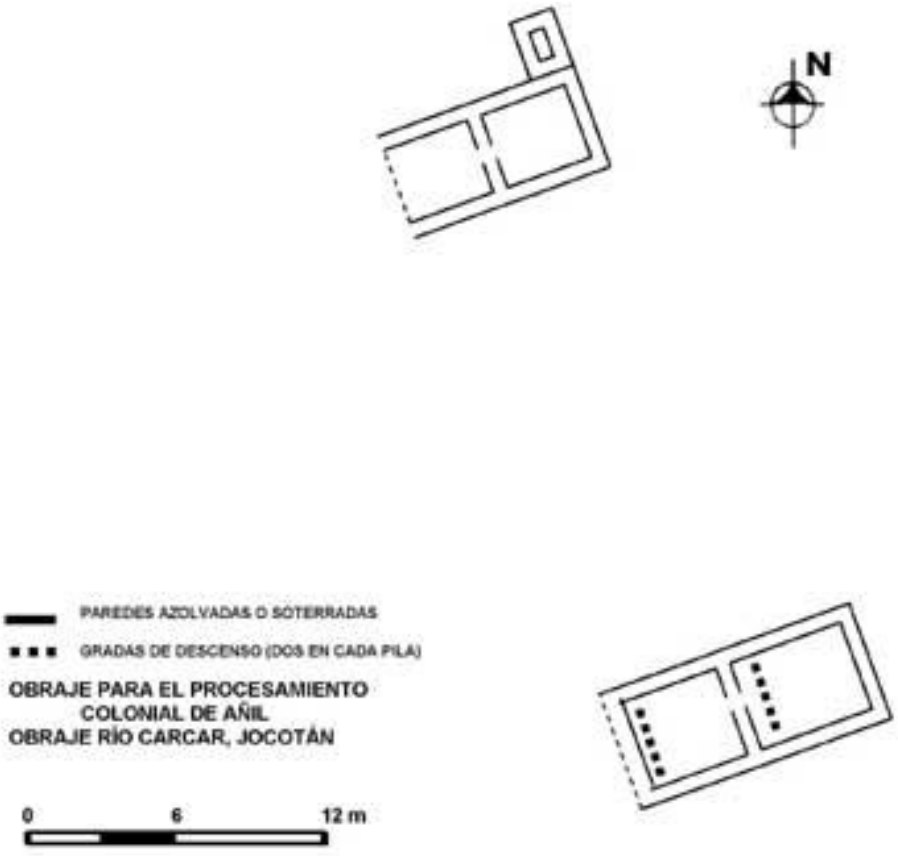

Figure 6. Río Carcar mill.

The first group presented the same two-trough structure, with its correspondent basin; however, the first trough was the one affected by the burying, and was only partially drawn. Presumably, if the road materials were removed, we would see that the construction is well preserved, as this is the general state of that which can be appreciated. The joining conduct between the first and the second troughs was identified. Unfortunately, one additional thing that may affect this group is that at the end of the place where the basin is found, a dumpster is beginning to form, which with time could achieve large proportions and leave the trough completely buried under the refuse.

In the second group, located southwest of the preceding one, only the troughs may be observed, the basin is either lost or completely clogged, but it was possible to establish the presence of two gradins in the first inner wall of the trough, and a similar amount in the inner wall of the second trough abutting the wall of the first one. The owner is Consuelo Lemus and the land is dedicated to agriculture.

- *El Brasilar, Camotán* (Figure 7): This site, located in the village with the same name, is the most controversial of all. It provided major historical information, already described above. Today, the mill is a spa where the troughs have become small thermal water pools, as the place still has the hot water source used for the jiquilite processing. This is the only hydraulic mill discovered so far. According to the land owners –the Amador family- the largest trough used to form two indigo-generating systems, one that drained towards west and the

other towards north, with a total of five troughs including one of the basins now missing. The system that drained towards west is complete, that is to say, it has its two troughs connected by the corresponding cocks as well as its basin. The system that drained towards north is incomplete, as the basin –according to the informants- was lost during the earthquake of 1976.

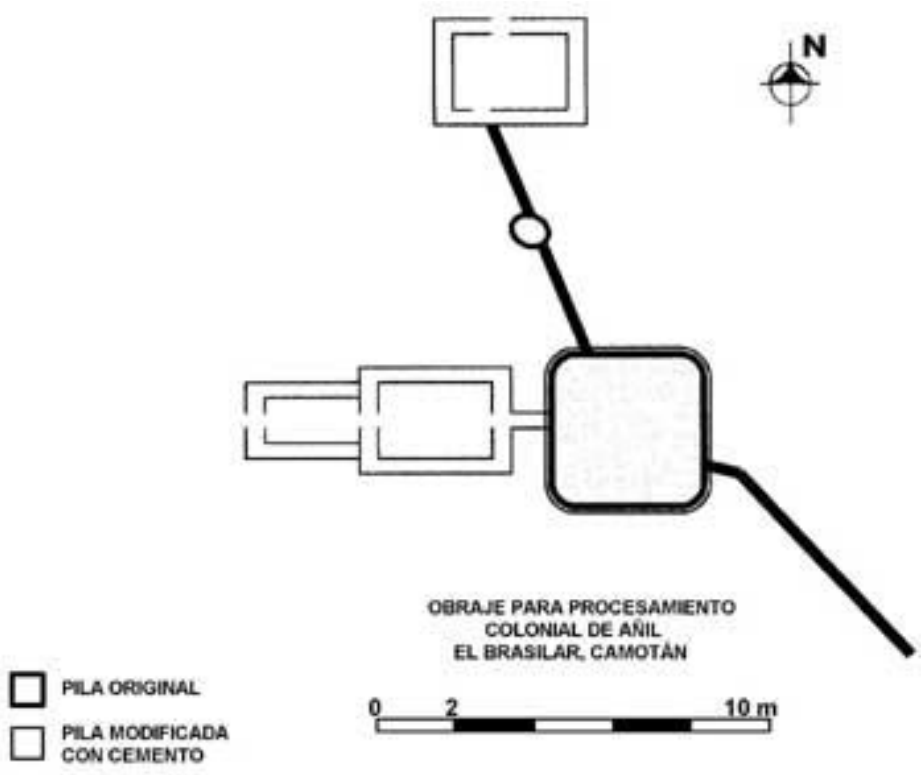

Figure 7. El Brasilar mill.

The construction of the first trough, with the use of a certain amount of mortar, does not seem consistent with the other existing evidences. According to the Amador family, that which appears to be mortar is in fact crust deposited by the thermal waters, a situation that needs further analysis before being confirmed or refuted, as according to Wisdom, the troughs were covered with mortar, a fact that evidence would support. The other existing troughs have unfortunately been covered with cement, making comparisons difficult. One major factor is the use of the canal used to feed the first trough that came from the water source. It is assumed that the other mills found were fed the same way, although in those others the way how hot water was supplied could not be established.

- *Palo Verde II, Camotán* (Figure 8): This site located in the hamlet with the same name in the jurisdiction of the Lelá Chancó village, belongs in part to the family of Leocadio Gómez, while the other part belongs to the family of Feliciano Espino.

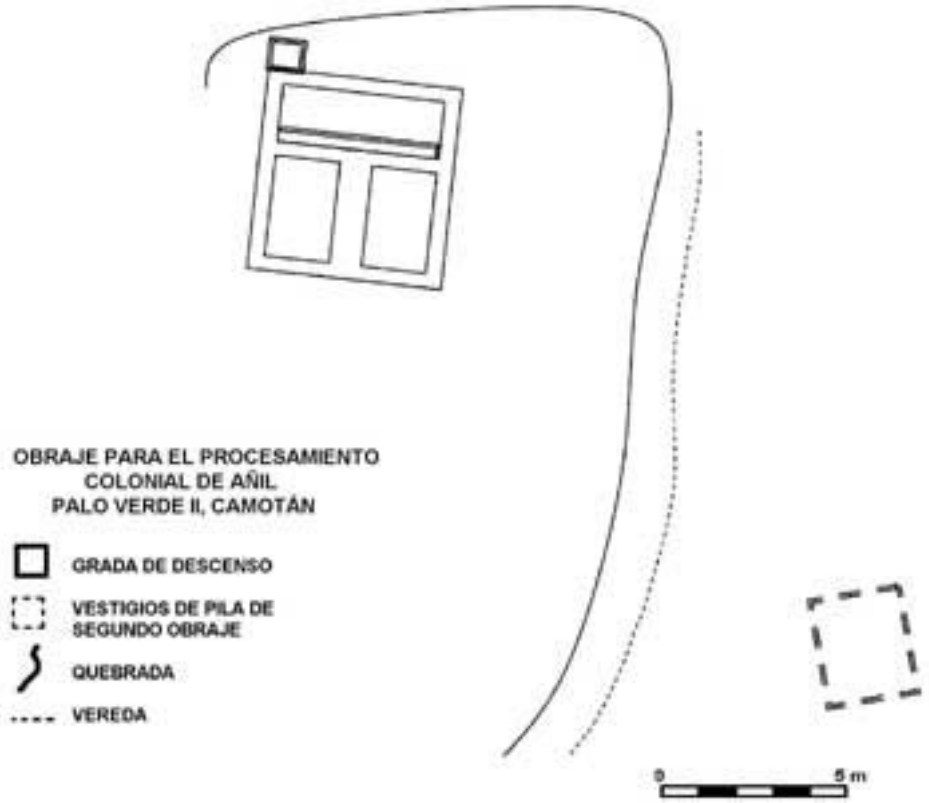

Figure 8. The Palo Verde II mill.

In the land owned by Leocadio Gómez there is a complex of the royal type, though modified, as it consists of three troughs and one basin. The maceration trough was divided into two troughs of similar dimensions, and perpendicular to them there was a third, smaller one (whipping trough), suggesting that the system was not identical to those described for San Juan Ermita and Jocotán. Finally, the basin is of considerably smaller dimensions. The whipping trough presents a gradin that descends to its base. Like cocks could not be seen, it was not possible to accurately establish how the system drained, and therefore, in a hypothetical reconstruction, it could be assumed that the two first would be used to prepare the maceration and that the third –the one perpendicular to the others- to receive the filtered liquid of the maceration.

In the lands of Feliciano Espino only the remains of one trough were at sight, and therefore, the available information was not adequate to establish comparisons with those of the other piece of land. The owner and his family were unable to provide any information on these vestiges, because they are not natives of the hamlet. They say that when they settled there, around 30 years ago, the remains were already in the same situation they are now. Both evidences are around 30 m apart from one another, so it is assumed that they formed a two-mill complex like those located in Jocotán and the site of Lemus II at San Juan Ermita.

PRESENT SITUATION OF INDIGO

The interest around the indigo production started early in colonial times. The Spanish obtained the blue color with which they dyed their fabrics from a plant known by the name of "pastel" *(Isatis tintorea)*, which was imported to Spain from France and Portugal. The Royal Letters Patent issued by Felipe II and dated in Valladolid for July 13, 1558, was addressed to the president and judges of the Royal Borders Tribunal, requesting information on the herb that *"has an effect similar to that of the pastel"*, and that consequently, it could be *"brought in these kingdoms for the fabrics that are here manufactured, it would be something of great importance and would allow for no longer having to bring the pastel from France or from any other kingdom";* the king commanded as well to be sent jiquilite samples, indicating how it was to be grown, the climates appropriate for its development, the procedures the Indians used to produce the dye, and the additional uses it was given (Kojima 1999: 4-5).

No doubt, this information helped to establish the indigo mills, obviously implying that the indigenous entered a cycle of "industrial" exploitation that was previously alien to them. Obtaining a dye had basically been a domestic work so far, whenever the purpose was dying the clothes, or a highly specialized one, whenever it was carried out by the artists who painted codices, vessels or murals. An example of this exploitation is present in a document dating to 1579, in which the Tribunal of Mexico addressed the tribunals of Guatemala and Yucatán, making reference to the evil effects for the health implicit in the processing of jiquilite, and commanding that the indigenous were not to accomplish such work (Chinchilla1975: 474-475; Standley and Steyemark 1946:271).

This effect damaging for the health may produce nausea, vomiting, hypertension, bradycardia, and occasionally, reactions of hyper sensitivity such as skin rush, itch, and broncho-spasms, and has been identified by some authors as the reason why the dye ceased to be produced, though most probably this interruption responded to multiple factors, as we have earlier explained.

Nevertheless, indigo by then had left behind its time of splendour, occurred between 1760 and 1792, when it was exported by the *criollo* and Spanish immigrants who lived in Guatemala City. They would buy it in the great annual fairs organized first in Guatemala and later in El Salvador, between November and April every year, wherefrom it was transported in mules to the mills. Ximénez also provided a brief indication of its commercial significance, when he noted that *"this is a herb or shrub, of which in this Kingdom of Guat(emal)a many interests are derived because of the indigo produced, and it is taken to Europe in large quantities"* (Ximénez 1967:248).

Today, the World Health Organization has issued several mandatory warnings regarding the use of synthetic colorants, and some of them have even been banned. For this reason and because of the current consumer trend to use products of an organic origin, natural dyes have once more conquered the preference of users; in fact, in industrialized countries the clothes and garments colored with natural dyes have a high market value. This represents a great advantage to countries such as Guatemala or El Salvador, where history is the background that supports the renovation of this industry, something that obviously may represent an alternative in

the agricultural production of the country, while simultaneously the archaeological relics could be included in the design of a new touristic destination, mostly in the Copan-Ch'orti' basin where both yield an economic profit.

Some examples of the reactivation of the jiquilite exploitation are already taking place in Guatemala and El Salvador. In Guatemala, around 50 peasants from eleven communities of Barillas (Yula, Chancolín and Espíritu de Ixcan), in Huehuetenango, and seven from Playa Grande (Kaibil Balam, Flor del Norte, Xalbal, etc), in Quiché, have begun to grow indigo. In El Salvador, the projects are more developed and therefore their achievements already reflect economic benefits. The National Council for Culture and Art, CONCULTURA, played a significant role in these projects, later joined by several other international organizations. El Salvador has exported indigo to Turkey, Switzerland, Germany, France and Japan, where the country was able to place up to 550 kg, while plans are already being made to include England, Canada, the United States, México, the Netherlands, Colombia and Guatemala. In addition, the finished product (blouses, tablecloths, handkerchiefs, pareos, toys, scarfs, etc), are a part of the added value of indigo, both for national and international production. With some common efforts, identical achievements could be reproduced in San Juan Ermita, Camotán and Jocotán, where the elders of the Amador family are still there to teach how to give indigo its exact "point".

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Figure 1 Costume of a Ch'orti' woman, decade of 1930 (taken from Wisdom 1940:115)

Figure 2 The Lemus I mill