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Mexican ikat and transatlantic trade
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The earliest text known so far in the Americas was engraved on a potsherd found in Chiapa de Corzo in southern Mexico that has been dated to around 300 years before our era. The script appears to represent a language in the Mixe-Zoquean family (which developed historically along the Isthmus of Tehuantepec), and it has been proposed that the inscription on the clay reads as follows: “The pleated cloth got dyed. The thing that is made of pleated cloth has been cut.”¹ If this interpretation holds true, the text must refer to a textile that was patterned by means of compression-resist dyeing. Since fabric in ancient Mesoamerica and the Andes was woven to size and never cut or tailored, it seems likely that the second part of the inscription relates to the removal of threads or binding that would have compressed the folded cloth.

It is plausible to relate the ancient text from Chiapa specifically to compression-resist dyeing because there have been at least three findings of pre-Columbian tie-resist and stitch-resist dyed cloth in Mexico. The first and most impressive example was uncovered in Apaseo el Alto (in the state of Guanajuato in central Mexico) in the late 1800s. The site was not excavated by archaeologists but explored by an amateur,² and no trace of the textile has been found since then except for a photograph published in 1897,³ which shows it to have been a sizable mantle, apparently made out of agave fiber. The designs in the photo are complex and reflect consummate skill; the art of resist-dyeing had evidently reached a high degree of sophistication in Mexico before the European invasion. Two archaeological fragments of cotton fabric found in a dry cave in the Tehuacán valley,⁴ and a larger piece unearthed at La Ciudadela in Mexico City,⁵ are less spectacular examples of tie-resist dyeing, but they show nonetheless that the technique was widespread, and it served to embellish textiles fashioned with different fibers. Furthermore, the style of compression-resist patterning left an imprint on other media during the post-Classic period (900 to 1521 AD), as evidenced by polychrome ceramics from Oaxaca decorated with circular designs in three colors against a dark background.⁶

Documents drafted shortly after the Spanish conquest indicate that a cotton mantle dyed a deep blue with geometric designs was reserved for the tlàtoāni⁷, the foremost ruler in the

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⁵ Román, personal communication.
⁷ In this paper I follow the orthography of Launey, *An introduction to Classical Nahuatl*. 
Nahuatl-speaking realm of central Mexico. The name for the garment, *xuhtlalpilli tilmáti*, specifies that it was knotted and dyed with indigo. The detailed depiction of the royal mantle worn by Nezahualpilli (monarch of Texcoco), as illustrated in Codex Ixtlilxochitl, suggests that it was patterned by both tie and stitch-resist dyeing. The techniques appear to have retained connotations of prestige throughout the colonial period, as witnessed by the portrait of Sebastiana Inés Josefa de San Agustín in 1757. The young woman in the picture was the daughter of *caciques* (members of the indigenous aristocracy) who was dressed up in her finest clothing and jewels on the occasion of her entry into a convent to become a nun. She wore a *huipil* (the Mesoamerican tunic reserved for women) with red motifs on a dotted white background, most likely achieved by compression resist-dyeing on the finished webs. As if to emphasize her social standing, one of the designs that can be made out in the painting is the double headed eagle of the Habsburgs (who ruled Spain at the time of the conquest of Mexico and Peru), topped by a large crown.

Tie and stitch-resist dyeing survived into the 1950s in a small region of the Sierra Gorda and the Mezquital Valley in central Mexico, but nowhere else in Mesoamerica, as far as is known. Irmgard Weitlaner Johnson, foremost researcher on Mexican archaeological, historic and ethnographic textiles, recorded the work of doña Sixta Trejo Zamorano, one of the last masters of both techniques in the country. Doña Sixta used indigo and cochineal to create the four-color skirts worn traditionally in her home town of Vizarrón (state of Querétaro) as festive attire. Prior to Johnson, Elsie McDougall had documented the same basic procedures used by doña Romualda Olguín in the nearby community of Guadalupe in the municipality of Zimapán (state of Hidalgo) to embellish aprons. In both instances, the fabrics employed to fashion the skirts and aprons were of handspun wool woven on a backstrap loom, used in Mesoamerica since antiquity. The garment worn in Vizarrón was not the indigenous wrap-around, however, but rather a skirt gathered onto a waistband, a format of European origin like the apron.

In the 1970s, Ruth Lechuga, a specialist on folk art, met doña Dolores Aguilar from the hamlet of Chavarria in the mountains east of Vizarrón, who had not practiced resist-dyeing for twenty years, but who was able to recreate the ponchos formerly worn by men in that area. Woven in a twill structure with handspun wool, they were knotted with agave fiber and dyed with cochineal or indigo to attain a simple pattern of white dots on a plain or striped background. Similar ponchos from other regions in central Mexico, also made with handspun wool in a twill weave, were formerly dyed with cochineal and other dyestuffs, not by means of tie-resist but in the procedure of warp ikat. They were recorded by Irmgard

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W. Johnson in the municipality of Ixmiquilpan in the Mezquital Valley, and by the author of this paper in the mountains east of Santa María del Río in the state of San Luis Potosí. Like compression-resist dyeing in the Sierra Gorda, warp ikat has died out in both of these areas.

Ikat is of particular historic interest in Mexico because of its close association with the *rebozo* (a rectangular shawl fashioned out of a single web, with warp fringes on both ends), an outstanding icon of nationalism and femininity. The evolution of the *rebozo* has been studied extensively by Ana Paulina Gámez and by an earlier generation of scholars; in this paper, I focus on other ikat-patterned textiles, which have received less attention by researchers but which hold interesting clues about the early history of resist dyeing in the region at large. Unlike tie and stitch-resist dyeing, no archaeological textile is known that can attest to the use of ikat in pre-Columbian times north of the equator. In spite of the absence of early specimens, a number of lines of evidence make it seem likely that the technique had Mesoamerican antecedents: to begin with, it has a considerably wider distribution than tie and stitch-resist dyeing in Mexico, and it is also found in Guatemala.

Ikat is used for a larger diversity of fibers than tie and stitch-resist dyeing, which have only been recorded on wool in textiles made in the 1800s and 1900s within the small area cited earlier. In contrast, there are numerous examples of *jaspe* (as ikat is known in Spanish) dating from the same time period made with cotton or silk (and, more recently, rayon or other synthetic fibers) in Mexico and Guatemala, in addition to ikat-dyed ponchos, rebozos and bags from central Mexico made out of wool. Furthermore, the fiber used traditionally to bind the threads for resist dyeing was invariably *ixtle* (agave fiber, extracted from plants that are native to Mesoamerica), the same material that was used for tie and stitch-resist dyeing in the Sierra Gorda and the Mezquital Valley. The wool dyed by means of the ikat process (and also in tie and stitch-resist dyeing), was always spun by hand with the indigenous *malacate* spindle, whereas all the examples that I have examined made with cotton or silk show threads that had been processed in large workshops or by industrial machinery. The degummed and reeled floss used for the warp and weft in the silk pieces was probably imported from Asia or Europe.

A number of archaeological examples of warp ikat have been found on the Pacific coast of Peru. This boosts the likelihood of an early presence of the technique in Mesoamerica because quite a variety of complex textile structures that are attested in the Andean zone during the pre-Hispanic era are similarly known ethnographically from northern Mesoamerica, but not from southern Mexico or Guatemala. These include patterned gauze,

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14 Kirsten, A. Johnson, de Ávila & Démián Ortiz, ed. Irmgard Weitlaner Johnson, una vida dedicada al textil, (Oaxaca: Museo Textil de Oaxaca, 2014), 55.
double cloth, double weave with a single weft, supplementary warp weaves, transposed warps, and tubular weaves with a continuous spiraling weft. Some of these structures have not yet been formally analyzed and published, but they are reliably documented in the collections of the Museo Textil de Oaxaca (MTO), where I have identified them. Because of their early presence in South America, they have been regarded so far as techniques of Andean origin, but it is feasible that some of them may have originated in Mesoamerica and travelled south, as was shown recently to be the case in the domestication of cochineal, *Dactylopius coccus*, and its host plant, *Opuntia ficus-indica*. In a few antique textiles from Mexico that have survived to the present, resist dyeing is combined with some of these intricately woven structures, as in a silk sash at the MTO probably dating from the late 18th century, where the central pattern of supplementary warps gimped with silver foil is bordered by ikat stripes in a rich magenta, evidently colored with cochineal (catalog number FAJ0299).

Also relevant to the possibility that ikat may have been known in Mexico before 1521 is the fact that it was used until the mid-20th century to decorate a uniquely Mesoamerican format, the *quēchquemitl* (a closed cape-like garment composed of two webs sewn together on a right angle). Moreover, the area where warp-ikat examples of this type were woven, both in cotton and in silk or rayon, matches closely the region where tie and stitch-resist dyeing persisted until the 1950s. In addition to the *quēchquemitl*, warp ikat was also used to embellish two types of textiles that have pre-Columbian antecedents: sashes and bags. When I examined the earliest ikat sashes and garters that have been documented in Mexico, which appear to date to the late 1700s (given that a similar textile, which is part of the same original collection, bears the date 1792, woven with supplementary wefts), I was intrigued to find that the resist-dyed warp stripes consist repeatedly of twenty pairs of threads, or multiples thereof. This numerical feature is significant because the languages indigenous to Mesoamerica use a vigesimal (base 20) numeral system. Vigesimal counts are so pervasive in this part of the world that they constitute one of the defining features of Mesoamerica as a Sprachbund or language area. On the grounds of intellectual economy, it makes sense to cling to a canonical number when the need arises to do substantial multiplications and divisions, as a weaver needs to do in setting up an ikat-dyed warp with repetitive pattern units.

The same observation holds true for two *quēchquemitl* that I examined from the Sierra Gorda in the Acervo de Arte Indígena, CDI. One was woven with silk in the head town of Tolimán (catalog number 11320), while the second piece was made with cotton in nearby San Miguel (no. 11319). I found that in both cases, the repetitive stripes in the central field (customarily a total of thirteen in the area of Tolimán) were composed of twenty pairs of warps. The 520 threads needed for the overall pattern must have been grouped together in the beginning, to be subdivided later according to the pattern bound on the warps prior to

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dyeing, and then reassembled on the loom after the dye bath. In this cumbersome sequence of lumping, splitting and regrouping threads, the recourse to a canonical number would ease the cognitive load of the task. Furthermore, I have found a correlation between vigesimal counts and the use of indigenous materials (stripes of handspun cotton, either white or coyuchi – natural brown color) in early rebozos I have looked at in the AAI-CDI (catalog number 15076) and in the collection of the Franz Mayer Museum in Mexico City (nos. DRA-0010, 0028 & 0045). Conversely, similar pieces that I have examined, dating from about the same time and made exclusively with imported silk, do not show base twenty warp counts (nos. DRA-0001, 0020, 0023 & 0024).

After making these observations, in March of 2016 I interviewed don Evaristo Borboa Casas, master rebozo weaver from Tenancingo (State of Mexico). When I asked him about the warp counts, his response was prompt and succinct: “Most [of the jaspe patterns] consist of forty threads [i.e., twenty pairs].” Since that interview, I have looked at various examples from Tenancingo (which remains the most important rebozo weaving center in the country) and I find that some do show, indeed, vigesimal stripes, but that is not always the rule. I understand the comment made by don Evaristo, who was trained as a weaver in the 1930s, as a generalization that was applicable to early rebozos, which were considered the model to be followed by accomplished artists like him. The relationship between ikat (as well as other textile techniques) and the Mesoamerican numerical system calls for further research.

Some ikat sashes that were still worn in northeastern Mexico in the early 1900s bear proof of a more subtle link with ancient cultural history. In my fieldwork in the central region of the state of San Luis Potosí in the 1970s, I recorded information on silk and cotton ceñidores (wide sashes formerly worn by men in the area where part of my paternal family came from) with a curious gap in the patterns at the center of the garment. The collection of the MTO includes two examples I obtained from relatives on my grandfather’s side (catalog numbers CEN0044 & CEN0116). Doña Justina Sánchez de Ávila, who recalled how the ceñidores were made, explained that they were woven on a backstrap loom set up on a ring warp. As the weaver advanced, doña Justina recounted, she would make the warp slide down on the loom bars to keep the point of insertion of the weft close at hand: “[The sash] was warped closely together, and as it was woven, it was pulled down and made to slide. They left a piece [unwoven] to cut it later to make the fringes… They warped it in a single set [of threads]. They would make it slide as they wove it.”

Although doña Justina did not explain it at the time, I noticed later that the sequence of indigo-dyed ikat patterns in the ceñidores, as well as the orientation of the individual motifs, became inverted after the dark blue gap at the midline of the garment, as if the design was mirrored at that point. I understood then that weavers took advantage of the ring warp, folding it in half and binding it with agave fiber to create the patterns, dyeing and unfolding it afterwards to economize on the work. Annular looms, like the quēchquemitl and the complex weaving structures shared with the Andean region mentioned earlier, are restricted to northern Mesoamerica. The correlation of ikat with a ring warp seems to speak again of an early development of resist dyeing in central and northeastern Mexico.
An additional line of evidence to make the case for a long history of ikat in that same area is provided by linguistic analysis of textile nomenclature. In 1799, in response to a questionnaire sent out by the viceroy regarding local manufactures, the subdelegate in Actopan (to the southeast of Zimapán in the Mezquital Valley) wrote the following: “…most of the persons who have always dedicated themselves to producing rebozos and various curious small pieces of cotton and silk are women, but they do so at the expense of great effort, since they use malacate spindles and backstrap looms, which demand more time than spinning wheels and treadle looms.” Pressed by the authorities in Mexico City to provide more details, the subdelegate sent a second letter: “…it is not possible to respond how many women [do this work] with a fixed number because, although most of them are of European ancestry, they employ some dexterous Indian women as their laborers. Their progress has been to weave some fabrics they call of jaspes, also known as malacahuile; I attach some small samples of everything so that Your Excellency may perceive the immense amount of work they invest, and the meager profit they enjoy…”22

The Hispanized term malacahuile mentioned in the second letter was borrowed from the Nahuatl malacahuilli. The etymology of the latter can be interpreted as “the lightness of the spindle” or “the frivolity of the malacate.”23 The subdelegate’s account suggests that the name referred specifically to jasper-like ikat-dyeing, a procedure which requires endless hours of finely skilled work. To call it “light” or “frivolous” seems to intend much irony. Such a semantically loaded designation suggests that indigenous weavers had been familiar with the technique for a long time.

Some of the designs found on ikat sashes and quēchquemītli from the Sierra Gorda and Mezquital Valley provide a further connection with native textile traditions. Stepped frets, lozenges with hooks, curly Ss and Zs, and other basic motifs of the Mesoamerican repertoire are salient in those garments, but they also display geometricized vines, pomegranates, bunches of grapes stylized as pineapples, and other figures of European and West Asian origin. Similarly, rebozos from the first half of the 19th century boast bold hearts, carnations and cypresses, among other designs popular around the Mediterranean. Perhaps more significant than the individual motifs is the marked tendency of ikat patterns on both indigenous (sashes, quēchquemītli) and hybrid garments (early rebozos, ponchos) to follow a hierarchical arrangement of warp stripes. The margins of the web, which are the selvages where the weft turns back, are set off by wide and more elaborate designs. The central field, in contrast, is decorated with narrow stripes with simple patterns. Moreover, in quēchquemītli and early rebozos there is a further hierarchy in the central field, with two or even three kinds of alternating stripes that show decreasing girth and complexity of design.

A hierarchical arrangement of warp stripes is characteristic of ikat textiles from the Levant and Western Asia. Hamam towels woven in Syria in the 1800s and similar fabrics made in Turkey show wide stripes with relatively elaborate patterns along the margins, and

22 Anonymous, Reservadísimo sobre fábricas y telares, letters from the subdelegate of Actopan.
repetitive stripes of simple design in the central field. Some ikat wall hangings from Iran woven in a warp-pile velvet structure bear remarkable resemblance to Mexican rebozos from the first half of the 19th century, with wide, three-dye bath stripes at the selvages and a three-tier hierarchy of stripes in the central field. An outstanding example is part of the collection of the MTO (catalog number LIE0031). Barbara Mauldin has found documentary evidence to link Mexican ikat (and presumably its Guatemalan and Ecuadorian counterparts, as well) back to the Islamic world through the export of raja jaspeada to the Americas in the 1500s; the trade inventories specify that the fabric by that name was woven in Granada in southern Spain. Mauldin traces the spread of the technique across the Mediterranean by means of early commerce between Baghdad and the caliphate of Córdoba in Andalucia.

Ikat rebozos depicted in Mexican casta paintings (conventionalized representations of ethnic admixture) from the last quarter of the 18th century, however, do not illustrate a hierarchical scheme with wide bands at the margins and narrow spotty stripes in between. They show, instead, a few wide stripes of a simple repetitive pattern, such as large chevrons, in blue or red against white. The ikat stripes are evenly spaced throughout the garment, alternating with warp bands of solid color. This arrangement is strongly reminiscent of weft ikat toiles flammées woven in France during the same period, which had become fashionable in Paris after king Narai of Thailand sent an embassy laden with colorfully patterned silks and other luxury goods to the court of Louis XIV. Weavers in Rouen learned resist dyeing avidly, producing cotton yardage with simple patterns colored with indigo. This fabric became popular all over Europe and appears to have influenced workshops as far away as Sweden and Mallorca.

It seems likely that weavers throughout the Spanish empire, ruled at the time by the Bourbons (originating in France), would have sought to emulate Parisian fashion. Resist-dyed textiles are not apparent in the extensive pictorial record of Latin America before the late 1700s. In the case of Mexico, indigenous weavers who may have known how to make warp ikat sashes and other garments could have easily adapted the style of the weft patterned toiles flammées to their backstrap looms, after they had become exalted in Europe. In support of this hypothesis, some of the earliest surviving rebozos combine wide stripes of simple warp ikat patterns with elaborately embroidered scenes depicting promenades and country outings, a prestigious theme in French paintings, porcelain and printed textiles of that period that may have crossed the Atlantic. The designs on the Mexican examples of that type were stitched with imported silk in multiple colors, as well

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25 Mauldin, personal communication.
26 María Concepción García Sáiz, Las castas mexicanas, un género pictórico americano, (México, D.F.: Olivetti, 1989), 156, 211.
28 Fabrics Lebeau Trouvais, Gustavian style canopy bed, unpaged.
29 Teixits Riera, El ikat en Mallorca, unpaged.
30 Gámez, personal communication.
as gimped thread with silver or gold foil. The probability of a connection between early rebozos and French ikat seems to be bolstered by the parallel development in the late 18th and early 19th centuries of the kanavat in Russia, a bridal veil of silk with broad bands of simple warp ikat combined with baroque patterns woven with gimped supplementary wefts inspired by leafy garlands and medallions in lavish Parisian style. These veils, which were a specialty of the city of Kolomna, close to Moscow, bear an intriguing resemblance to some early Mexican rebozos. A beautiful example is now part of the holdings of the MTO (catalog number VEL0001).

Because of the intense trade between Mexico, the Philippines and China that began with the Manila galleon in 1565 and lasted for 250 years, it has often been assumed that the techniques and designs of Southeast Asian ikats must have shaped the development of the rebozo. As Christopher Buckley has pointed out, however, warp ikat in that large region has long been restricted to politically marginal peoples of Austronesian and Kra-Dai linguistic affiliation. For several centuries, the textiles of prestige over most of the region have been elaborately patterned weft ikat fabrics, woven mainly in urban workshops, with a heavy influx of complex Hindu and Buddhist iconography that spread from the Indian subcontinent. It is such textiles that we would expect to have reached Mexico via trans-Pacific trade. Early rebozos do not seem to show an imprint of that style of design. Moreover, the specific motifs and asymmetric arrangement of stripes that Buckley reconstructs as prototypes of Austronesian warp ikat weaving do not match the patterns and the symmetry that characterize the indigenous sashes and quēchquemitl of the Mezquital Valley and the Sierra Gorda, which appear to be the most conservative areas for resist dyeing in Mesoamerica.

In conclusion, I propose as a working hypothesis that native traditions of resist-dyeing in Mexico were influenced by textiles made for trade at two different moments after the European invasion:
I. First in the 1500s by Andalusian jaspeado fabrics, presumably derived from warp-ikat textiles made in the Levant, historically related to early Indian patola by way of Yemen.

II. Subsequently by the weft-ikat toiles flammées that became fashionable in Paris in the 1700s inspired by Thai silks, which in turn bore the imprint of Indian patola.

This complex history, if it is confirmed by further research, would make Mexican resist-dyeing unique as a synthesis of diverse textile traditions from across the world, mediated by transatlantic trade.

From the point of view of artistic achievement, I should like to add that rebozos transcend a purely historical interest because they include what appear to be the finest examples of ikat on record. Weavers in the late 1800s in Tenancingo and nearby Calimaya took advantage of technological breakthroughs in England that allowed extremely fine cotton filaments to be spun by machines. When skeins of caliber 200/2, hair-thin thread were imported into

32 Gámez, personal communication; de María & Castelló, Historia y arte de la seda, 164-165.
33 Christopher D. Buckley, Christopher D. “Investigating cultural evolution using phylogenetic analysis: the origins and descent of the Southeast Asian tradition of warp ikat weaving.” PLoS ONE 7, No. 12 (2012), fig. 4.
34 Mauldin, personal communication.
35 Buckley, “Investigating cultural evolution.”
Mexico at that time, master craftsmen took it upon themselves to dye and weave patterned rebozos that could pass through an engagement ring. The results are amazingly exquisite. The MTO holds an outstanding example (catalog number REB0049, probably woven in Calimaya, according to don Evaristo Borboa), with a thread count of 90-91 cotton warps and 19 silk wefts per centimeter (228-232 warps and 48 wefts per inch). I have compared these thread counts with fine ikat examples from around the world in the MTO’s collection: a silk kasuri (warp ikat) kimono dating from the 1940s from Japan, a 19th century patolu (double ikat sari) from Gujarat in India, a pardah (wall hanging) of adras (warp ikat) dating from the 1800s from Bukhara in Uzbekistan, the aforementioned kanavat from Kolomna in Russia, an asoke (ritual fabric woven in narrow strips) mantle from the mid-1900s from Nigeria, a macana (warp ikat shawl) from Gualaceo in Ecuador, and a tzut (head cloth) from Sololá in Guatemala (both of the latter dating from the first half of the 20th century). The thread counts in the finest of these various examples do not reach half the density of the warps and wefts in the rebozo. It looks like the art of resist dyeing attained a global pinnacle in these delicate garments from the center of our country.

In view of the complex history and aesthetic excellence of ikat and tie/stitch-resist dyeing in Mexico, it is sad that their cultural significance remains poorly appreciated. Writing about the Chiapa de Corzo sherd – the earliest text known in the Americas, as I pointed out in the introduction to this paper, a well-known author remarked some years ago in a best-selling book that, once the script was deciphered, “disappointingly, it turned out to be some banal utterances about dyeing and cutting cloth.” Let us hope that the legacy of artists of the stature of don Evaristo and other textile masters across the world will eventually dissipate such crass misperceptions.

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