

Research Article

Cultural Variables for the Study of Social Inequalities in the Late Herrera Society of the Cundiboyacense Altiplano, Colombia (Part One)

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Abstract: This article focuses on the interdisciplinary analysis of four cultural variables, which allow us to infer an intermediate range of social inequalities in the Late Herrera culture of the Cundiboyacense Altiplano: a) settlement patterns and architectural structures, b) intensification of primary food production (agriculture and hunting), c) increase of craft production (pottery and textile production), and d) cultural interaction. Based on the data obtained from research in the fields of archaeology, archaeobotany and iconography during the last 50 years in the Altiplano Cundiboyacense, I suggest that the Late Herrera society was the first chiefdom society in this important region of Colombia, and that it represents a new level of increasing complexity reached by pre-Hispanic societies.

Keywords: *Cundiboyacense Altiplano, Increasing Complexity, Late Herrera, Food production, Craft production.*

Resumen: Este artículo se centra en el análisis interdisciplinario de cuatro variables culturales, que permiten inferir un rango intermedio de desigualdades sociales en la cultura Herrera Tardío del Altiplano Cundiboyacense: a) patrones de asentamiento y estructuras arquitectónicas, b) intensificación de la producción primaria de alimentos (agricultura y caza), c) aumento de la producción artesanal (alfarería y producción textil) y d) interacción cultural. A partir de los

datos obtenidos en las investigaciones en los campos de la arqueología, la arqueobotánica y la iconografía, durante los últimos 50 años en el Altiplano Cundiboyacense, sugiero que la sociedad Herrera Tardío fue la primera sociedad cacical en esta importante región de Colombia, y que representa un nuevo nivel de complejidad creciente alcanzado por las sociedades prehispánicas.

Palabras clave: *Altiplano Cundiboyacense, Complejidad Creciente, Herrera Tardío, Producción de alimentos. Producción artesanal.*

Resumo: Este artigo enfoca a análise interdisciplinar de quatro variáveis culturais, que nos permitem inferir uma gama intermediária de desigualdades sociais na cultura Herrera tardia do Altiplano Cundiboyacense: a) padrões de assentamento e estruturas arquitetônicas, b) intensificação da produção de alimentos primários (agricultura e caça), c) aumento da produção artesanal (cerâmica e produção têxtil), e d) interação cultural. Com base nos dados obtidos de pesquisas nos campos da arqueologia, arqueobotânica e iconografia durante os últimos 50 anos no Altiplano Cundiboyacense, sugiro que a sociedade Late Herrera foi a primeira sociedade de cacique nesta importante região da Colômbia, e que representa um novo nível de complexidade crescente alcançado pelas sociedades pré-hispânicas.

Palavras-chave: *Cundiboyacense Altiplano, Complexidade crescente, Herrera tardia, Produção de alimentos, Produção artesanal.*



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摘要: 本文着重于对四个文化变量的跨学科分析, 这使我们能够推断出昆迪博亚肯斯高原晚期埃雷拉文化的中间范围的社会不平等: a) 定居模式和建筑结构, b) 初级食物生产的强化(农业和狩猎), c) 工艺生产的增加(陶器和纺织品生产), 和d) 文化互动。根据过去50年在昆迪博亚肯斯高原的考古学、考古植物学和图像学领域的研究获得的数据, 我认为晚期埃雷拉社会是哥伦比亚这一重要地区的第一个酋长社会, 它代表了前西班牙社会达到的日益复杂的新水平。

关键词: *Cundiboyacense Altiplano, 越来越复杂, Late Herrera, 食品生产, 工艺生产*

РЕЗЮМЕ: Эта статья посвящена междисциплинарному анализу четырех культурных переменных, которые позволяют нам сделать вывод о промежуточном диапазоне социального неравенства в культуре поздней Эрреры на Альтиплано Кундибоясенсе: а) модели поселений и архитектурные структуры, б) интенсификация производства первичной пищи (сельское хозяйство и охота), в) рост ремесленного производства (гончарное и текстильное производство) и г) культурное взаимодействие. Основываясь на данных, полученных в результате исследований в области археологии, археоботаники и иконографии за последние 50 лет в Альтиплано Кундибоясенсе, я предполагаю, что общество поздней Эрреры было первым обществом вождества в этом важном регионе Колумбии, и что оно представляет собой новый уровень возрастающей сложности, достигнутый доиспанскими обществами.

Ключевые слова: *Альтиплано Кундибоясенсе, возрастающая сложность, поздний Эррера, производство продуктов питания, ремесленное производство.*

Introduction

The Cundiboyacense Altiplano is the best-studied archaeological region in Colombia. Interdisciplinary research conducted during the last 50 years has made it possible to establish the most complete sequence of sociocultural development in northern South America, which includes some 20000 years of antiquity. To define the different levels of sociocultural complexity, the metaphor of components or building blocks proposed by Fred Spier (2011) is very useful. He suggests, that in general, the different levels of increasing complexity can be established based on the following criteria: a) the number of components available since it is clear that with a greater number of components more complex structures can be obtained, b) the level of complexity can increase when the variety of building components increases, c) and d) levels of complexity can increase when the connections and other interactions between building blocks are more numerous and varied (Spier, 2011: 150). [1]

Based on Spier's proposal, I suggest that in the Cundiboyacense Altiplano, during the chronological span between 20000 BC and AD 1550 we can differentiate six different levels of increasing social complexity: 1) Hunter-gatherer societies (20000-8000 BC); 2) Early hunter-gatherer food-producing societies (8000-1300 BC); 3) Early Herrera society (1300 BC-AD 200); 4) Late Herrera society (AD 200-1000); 5) Early Muisca society (AD 1000-1350) and 6) Late Muisca society (AD 1350-1550). With the first three levels, we can associate egalitarian societies, while the following three levels correspond to hierarchical sociocultural structures of chiefdom type, with different magnitudes of development (Figure 1).

I have recently contributed several articles on the study of the first three levels (Rodriguez, 2019a, 2019b, 2021, 2022b). In the present essay, I will deal with the fourth level of complexity corresponding to the Late Herrera society. This paper focuses on the interdisciplinary analysis of three cultural variables, which allow us to infer an intermediate range of social inequality in the Late Herrera culture: a) settlement patterns and architectural structures, b) intensification of primary food production (agriculture and hunting), and c) increase of craft production (pottery and textile production). Using the data obtained from research in the fields of archaeology, archaeo-botanical, and iconography, during the last 50 years in the Cundiboyacense Altiplano, I suggest that Late Herrera was the first hierarchical society of the chiefdom type in this important region of Colombia.

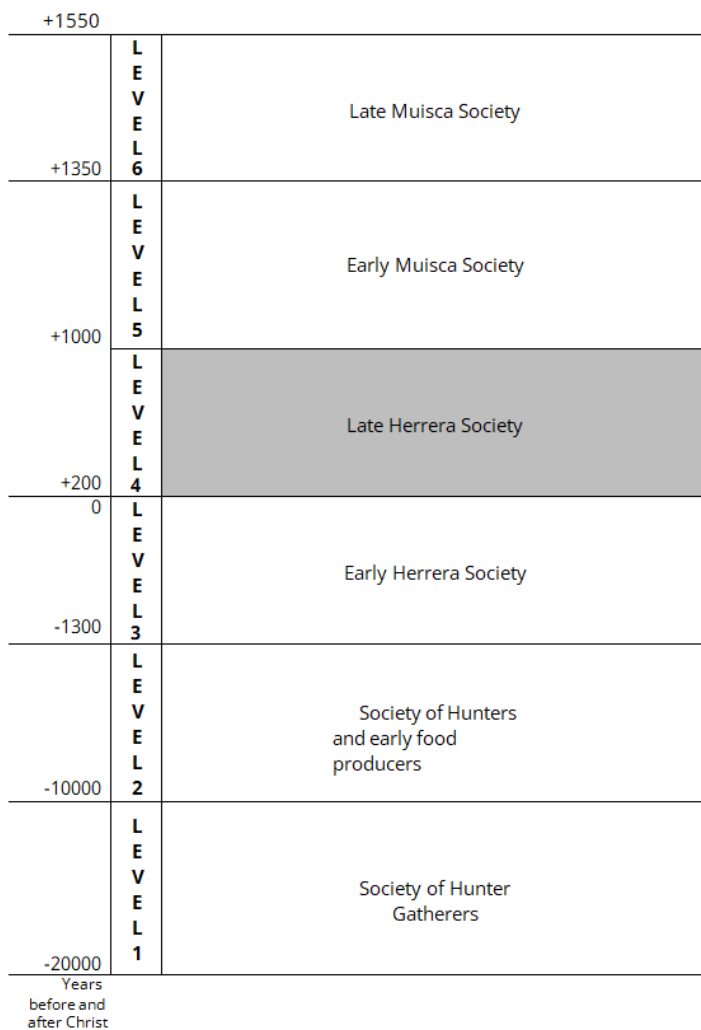


Figure 1. Timeline of the different increasing levels of social complexity present in the ancient history of the Cundiboyacense Altiplano.

Hierarchical societies of the chiefdom type

Chiefdoms are hierarchical forms of sociocultural organization, historically located between egalitarian hunter-gatherer societies and early food producers, and state societies. They represent ways of life of the highest phase of tribal social formation. Hierarchization as a social phenomenon is related to the emergence of social inequalities in the villages. This arises when one of the privileged sectors of each lineage begins to have specialized functions, generating new exclusive work processes, thus transforming the social relations of production. It is the study of the change in the social relations of production that allows us to understand the emergence and development of social inequalities between the different human groups that comprised the ancient societies. In turn, these social relations of production are based on the material relations of property or objective property (Sarmiento, 1986: 33, 46; Sarmiento, 1993: 98).

Analyzing in depth the emergence of social inequality, Lee (1990: 239) has rightly suggested that the development of this socio-cultural phenomenon is first

and foremost a consequence of food production. A more holistic proposal is that of Drennan & Peterson (2011: 76-78) for whom the social differences or social hierarchies that arise from tribal societies, were presented in several aspects: a) in the inequitable or differential distribution of wealth, b) differentiation in ritual activities, performed by certain members of the shaman- community, c) differentiation by the prestige of some individuals of certain lineages and d) productive differentiation that has to do with the social division of labor, between food producers (farmers) and producers of non-food or craft goods. Another important variable is the control of productive resources (soils, water resources, mineral resources such as salt, metals, or precious stones such as emeralds) by certain lineages of the community (Kruschek, 2003: 216).

We consider that in order to study the emergence of social inequalities among Late Herrera populations, it is necessary to analyze the following archaeological indicators: a) the intensification and control of primary food production (domesticated vegetables, terraces, irrigation canals, fertilizers, raised fields or camellones (Sarmiento, 1986); b) increase of craft production: pottery, textiles, and metallurgy, among others (Saitta & Keene, 1990); c) the increase in surplus production (mainly agricultural, pottery and textiles); d) the strengthening of exchange networks, which included elite goods (pottery and goldsmithing) (Kruschek, 2003); e) the use of metal objects as ornaments of the elites, which were placed as funerary goods of people who possessed economic, political, and religious (ideological) power (Lleras, *et al.* 2009); f) the medical-cultural practice of cranial deformation, implemented by the elites and their families (Perez, 2007); g) the medical-cultural practice of mummification of the elites and their families (Rosso, 2014); h) the differentiation in settlement practices within the villages. Houses and other larger constructions, in which better construction materials were used (Lee, 1990); i) differentiation in funerary practices: a) more complex tombs with greater investment of energy (forms), b) diverse forms of burial, and c) quality and quantity of grave goods (Lagutina, 2010).

As in this article we will analyze only the following three variables: a) settlement patterns and architectural structures, b) intensification of primary food production (agriculture and hunting), and c) increase of craft production (pottery and textile production). Due to space constraints, the other variables will be addressed in the second part of this article. For the analysis of these first three variables, we used information from 26 archaeological sites, which have reliable cultural and chronological contexts, including calibrated radiocarbon dates. However, we have prioritized the sites with the most information, such as the villages of Nueva



Figure 2. Spatial location of archaeological sites related to the Late Herrera society. 1. Cueva de Leuta. 2. Mesa de Los Santos. 3. Busbanzá. 4. La Lusitania. 5. UPTC. 6. Cómbita. 7. Tiguasú. 8. Muzo. 9. Tunja. 10. Pachavita. 11. El Venado. 12. Hacienda. La Francia. 13. La Filomena. 14. Guaymaral. 15. Santo Domingo. 16. Guatavita. 17. Nueva Esperanza. 18. Facatativá. 19. San Carlos. 20. Madrid. 21. Las Delicias. 22. Guasca. 23. Salcedo. 24. Villa de Leyva. 25. Chisacá. 26. Funza (Rodríguez, 2022a: Tomo 2: 177-184).

Esperanza, Suba, Cota, Las Delicias, El Venado, Iguazú, and Cercado Grande de Los Santuarios (Figure 2).

Settlement patterns and architectural structures

With the development of agriculture, craft activities, and a higher population density, the Herrera communities of the Cundiboyacense Altiplano, during the late period of their development, strengthened their settlements in villages located near water sources and the best natural resources, such as the most fertile soils and saline resources. In the few Late Herrera villages excavated, which contain reliable material and chronological contexts, large architectural structures with circular, rectangular, and half-moon shapes are highlighted. The location of these constructions in different sectors of the villages, as in the case of Nueva Esperanza, could be associated with the differential management of space and social inequalities.

The architectural structures of the village of Nueva Esperanza 2015: 71, 73) (Figures 3e, 3f).

In the village Nueva Esperanza, three types of architectural structures were built: a) circular plan dwellings, bohío type, b) rectangular dwellings, maloca type, and c) half-moon shaped spaces, where craft activities were carried out. Their construction, as suggested by their permanent modifications and readjustments, was built during long periods of reoccupation, which included the Early Herrera, Late Herrera and Muisca societies. [2]

Circular, bohío-type dwellings

Some of the circular constructions excavated in Nueva Esperanza, including those of larger dimensions, corresponding to the Late Herrera society. The circular dwelling floors of larger sizes were located near the rectangular type structures, which were the most architecturally complex (Lizcano, 2016: 233) (Figure 3). In Cut E26, excavated a circular bohío, possibly built around the 2nd century AD. Associated with this place appeared sherds of pitchers and pots of the Fine Quartz (FQ) and Abundant Quartz (AQ) types. Likewise, three complete ceramic vessels were found: two bowls and a small poporo, possibly obtained by exchange with foreign communities (Calderón, *et al.* 2015: 41, 45) Another circular structure 4 m in diameter with post footprints filled with lithic material was excavated in Cut E10. The most significant quantity of ceramics found at this site was of the FQ and AQ types (Calderón, *et al.* 2015: 29) (Figures 3a, 3b).

In Cut E34, several circular structures were identified, including one bohío that had a floor plan of 5 m in diameter, where ceramic fragments of the Mosquera Crushed Rock (MCR) and Tunjuelo Laminated (TL) types were found (Calderón, *et al.* 2015: 51, 53) Also, I should mention the floor plan of a bohío of about 5 m in diameter, which was excavated in Cut E43, associated with ceramics of Late Herrera types (Calderón, *et al.* 2015: 64-65). Two circular structures, with an average diameter of 6 m. were also excavated in Cut E41, where most of the ceramic materials found corresponded to Late Herrera types (Calderón, *et al.* 2015: 58, 60) (Figures 3c, 3d).

The largest circular dwellings found in the village were each 7 m. in diameter. The first one excavated in Cut E25 contained ceramic materials corresponding to the Late Herrera period (types FQ and AQ) and yielded a date of the 8th century AD (AD 740±30~Cal AD 775-820) (Calderón, *et al.* 2015: 3; Calderón, *et al.* 2019: 53). [3] The floor of the second bohío, probably contemporary with the previous one, appeared in Cut E51. Among the materials found in this unit, pots and jars of the Gray Temper (GT), TL and AQ types stand out (Calderón, *et al.*

The village Las Delicias

Bohío floors with average dimensions of 4.6 m in diameter were also found in the pre-Hispanic village of Las Delicias (Bogotá). An 8th century AD date (AD 770±70) obtained from dwelling 1, and another from the 10th century AD (AD 940±60) associated with a niche (Enciso, 1993: 154; Boada, 2000: 38), chronologically place these dwellings in the final period of the Late Herrera society.

The village Tiguasú

Circular bohío-type housing structures were also common among the Late Herrera communities of the northern sector of the Cundiboyacense Altiplano. In the village of Tiguasú (Sáchica Valley, Boyacá), Gaitán (1999) and Salamanca (2001) excavated three residential zones. Residential zone 1 occupied about 755 m² and was composed of five domestic units, which had an average area of 151 m² each. A date of the 7th century AD (AD 690±80~Cal AD 640-970) was obtained from the skeleton of burial 5, located in residential unit 2, while the skeleton of burial 7 found in residential zone 3 was dated to the 9th century AD (AD 850±50~Cal AD 815-840) (Salamanca, 2001a: 67; Salamanca, 2001b: 8).

The village Cercado Grande de los Santuarios

Large circular-shaped architectural structures have been documented by archaeologists in other Late Herrera villages in the northern sector of the Cundiboyacense Altiplano, as is the case of Cercado Grande de Los Santuarios in Tunja, where large bohíos have been used as an important variable to define social hierarchization, along with the proportions of ceramic forms and decorated ceramics (Lemus, 2018: 63-64). The residential units of the sites La Muela and Goranchacha, studied by Lemus in her archaeological surveys of the Cercado Grande de Los Santuarios in Tunja, deserve special attention (Lemus, 2018). As stated by this researcher, in La Muela three residential units (UR) were identified whose dimensions ranged between 8 and 14 m in diameter, while the area of the four domestic units of Goranchacha had 7 m in diameter (Lemus, 2018, 41). The UR-INCITEMA was the largest in the studied sector, with a diameter of 14 m. Linking the size of this dwelling to social stratification, Lemus suggests that:

"If only the approximate size of the residential units of the population of the Herrera period in the CGS were taken into consideration, *it could be affirmed that important people lived in the UR-INCITEMA, since to build a house of such a diameter, the investment of energy,*



Figure 3. Circular bohio-type structures found in the Nueva Esperanza village. A) Bohio excavated in Cut E26 (Calderón et al. 2015: 41). B) Bohio excavated in Cut E10 (Calderón, et al. 2015: 30). C) Bohio excavated in Cut E43 (Calderón, et al. 2015: 64). D) Bohio excavated in Cut E41 (Calderón, et al. 2015: 58). E) Bohio excavated in Cut E25 (Calderón, et al. 2015: 38). F) Bohio excavated in Cut E51 (Calderón, et al. 2015: 71).

materials, and work was greater than that needed to build the others. In addition, it could be said that the richest families of the Herrera period lived in the La Muela sector and that they managed to stand out in the community through the accumulation of wealth. Under this perspective, larger houses constitute a wealth good, however, more than the accumulation of wealth, the existence of larger houses shows the differential

consumption by the families of the community, which undoubtedly accounts for economic differences between them." (Lemus, 2018: 44-45) (emphasis added).

Large rectangular constructions, indicators of social status

The largest architectural structures, built in Nueva Esperanza, during the Late Herrera period, were four rectangular-shaped constructions, distributed in an



Figure 4. Rectangular structure excavated in Cut 29 of the village of Nueva Esperanza. A) Plan of the building, where the post footprints can be observed. B) Cross section of the central post footprint No. 91 (Calderón, *et al.* 2019: 55, 58).

area of about 800 m², in the center of the village, which presented the largest post-hole footprints recorded at the site. Their dimensions ranged from 6 to 25 m long and 3.5 to 12 m wide (Calderón, 2016a: 243). Three of these structures, the ones with the largest dimensions, were identified in cuts E25, E26, and E29. The fourth was distributed in Cut E53. One of these structures, found in Cut E29, was dated to the 2nd century BC (180±30 BC–Cal 355-285 and 230-155 BC) and is probably associated with the beginnings of social hierarchization in the village (Calderón, *et al.* 2019: 55) (Figure 4a).

Analyzing the post-hole footprints (Figure 4b), the construction of the large bohios and the large rectangular structure built towards the end of the 2nd century BC in Nueva Esperanza, Calderón *et al.* consider that they could be associated with the social differentiation:

"It is clear that the characteristics of the post footprints are closely related to the size and type of constructions of which they were part. Both the larger circular structures, as well as the rectangular plan structures, presented features of central posts wedged with clays that made it possible to give greater stability to large constructions. *If the labor investment involved is considered, the sizes of these buildings could have been a marker of status or social differentiation.*" (Calderón, *et al.* 2019: 57) (emphasis added).

Another rectangular structure, dated to the 10th century AD (AD 930±30 ~Cal AD 900-925 and 945-1020), indicates that towards the end of the Late Herrera society, this type of construction was at its peak. This is the construction located between cuts 25, 33, and 34, which had a built area of 316.94 m². It was built on 149 posts with a clay ring, of which 18 (the largest) had a structural function. Calculations made indicate, that almost 900 man-hours were used for its construction (Calderón, 2016a: 248-49, 253) (Figures 5, 6, 7).

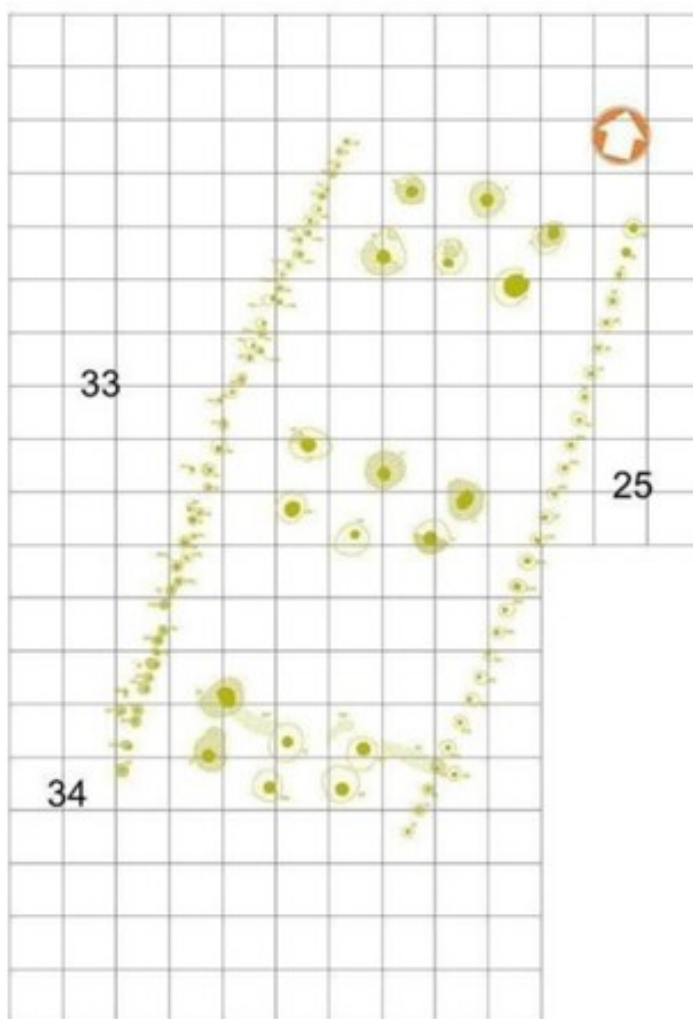


Figure 5. Plan of the rectangular construction excavated in cuts 25, 33, and 34, showing, in the foreground, the large post footprints that served a structural function (Calderón, 2016a: 249).

During archaeological excavations conducted between 2018 and 2019 in the south-central sector of the village of Nueva Esperanza, five rectangular-shaped structures were also found. The post footprints of these constructions were filled with a mixture of raw clay and

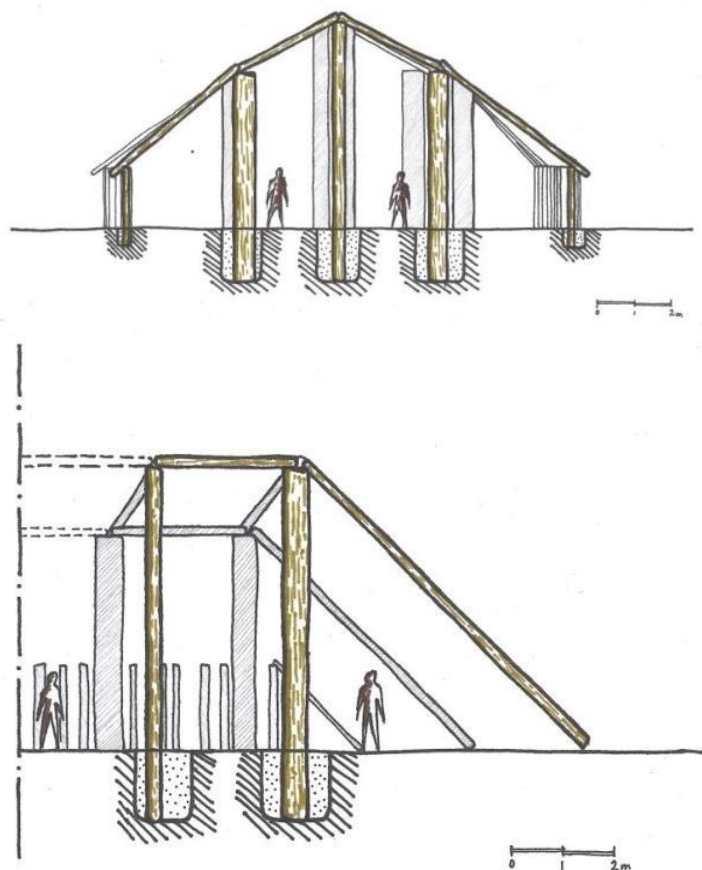


Figure 6. Architectural survey of the rectangular construction excavated in cuts 25, 33 and 34. Front and lateral cuts (Calderón, 2016a: 254).

volcanic ash (Rivas 2020a: 97-98, Photo 26). [4]

It is likely that the economic activities carried out in these rectangular structures, which are considered residences of the village elites, generated wealth and prestige for individuals and/or lineages that occupied a privileged position within the community. The differences with the production obtained in other domestic units of the village were probably related to the constitution of a political hierarchy (Lizcano, 2016: 231).

Thus, we could conclude that the presence of large rectangular residential structures and their spatial distribution in the Nueva Esperanza village, close to other large bohío-type constructions, as well as more complex technological elements used in their construction, suggest social differentiation and political leadership among the inhabitants of this important pre-Hispanic village in the Bogotá Savannah.

The half-moon shaped structures

In addition to the bohíos and rectangular houses, in the Nueva Esperanza village, there were also special places to develop domestic activities, such as preparing food and beverages and also crafts, where they made lithic instruments, ceramics, necklaces, spinning, and weaving. These workshops were found near the bohío-



Figure 7. Recreation of the Nueva Esperanza village, during the period of existence of the Late Herrera society, where one of the rectangular platforms can be observed (Romano, 2018a: 102-103).

type dwellings and were probably part of these domestic units.

Such is the case, for example, of three half-moon shaped structures located in Nueva Esperanza. One of them, identified in cut E14, was possibly a lithic workshop, with an area of 4.71 m². Several shaft tombs with niches, a typical funerary pattern of the Late Herrera society, were found inside this structure. Two other workshops were excavated in cuts E25 and E41, where lithic tools associated with food processing, such as grinding hands, scrapers, and polishers, were found (Calderón, *et al.* 2019: 53-54) (Figure 8).

Structures associated with hydraulic water management

Channels associated with hydraulic water management have been found in the villages of Nueva Esperanza and Madrid. In the northeastern sector of the village of Nueva Esperanza, two structures were excavated, possibly associated with hydraulic water management, related to the development of agricultural productivity: a 90 m. long canal, and a well for storage, where the canal ended. It is likely that both features were part of a hydraulic engineering project, which allowed the use of water from a hill located to the east of the site to the Bogotá River. Calderón *et al.* (2015: 35) have suggested that likewise in the village of Madrid (Rodríguez Cuenca y Cifuentes, 2005), the management and channeling of water may also have had ceremonial purposes (Figure 9).

Intensification of primary food production

The intensification of agriculture, employing technologies such as terraces, irrigation canals, and raised fields or camellones, was one of the main economic strategies used by elites to maintain power in chiefdom and state societies in different regions of the world. These intensive agricultural systems were based



Figure 8. Architectural structure in half-moon shape, found in cut E-41 (Calderón, *et al.* 2019: 54).

on massive transformations of local and regional landscapes. Archaeological research shows that the raised fields agricultural system supported large populations organized in villages of different sizes, located both in the inter- Andean valleys and in the lowlands of the Pacific and Caribbean regions of Colombia.

As in other Latin American countries, in Colombia, the agricultural system of raised fields or *camellones* was characterized by its great diversity in terms of its forms. This system has been studied mainly in Mompos, associated with the chiefdoms societies that exploited thousands of hectares in the ecosystems of the Sinú and San Jorge rivers (Parson & Bowen 1966; Plazas *et al.* 1993; Plazas y Falchetti 1981; Rojas & Montejo 2021). Likewise, in the Gulf of Urabá (Velez, 2011; Posada, *et al.* 2019), where U-shaped and chess board-shaped *camellones* were recorded. *Camellones* have also been studied archaeologically in the Bogotá Savannah (Boada, 2006), the Middle Cauca (Bruhns, 1981), the Calima region (Herrera, *et al.* 1990), the geographic valley of the Cauca river (Bray, *et al.* 2005; Bray & Moseley, 1967) and the Pacific coast (Salgado y Stemper, 1995; Patiño, 2006). It is very likely that in the pre-Hispanic chiefdoms of all these regions, this type of large-scale construction was associated with three important social phenomena: first, with the intensification of food production through agriculture and probably fish farming; second, with population growth; and finally, with economic control by the chiefdoms power structures, which existed at least during the 1000 years that preceded the Spanish conquest in the 15th century of our era.

Agricultural intensification

In general, we can assume that during the period of existence of the Late Herrera society there was a greater development of the productive forces than during the previous period of the Early Herrera society

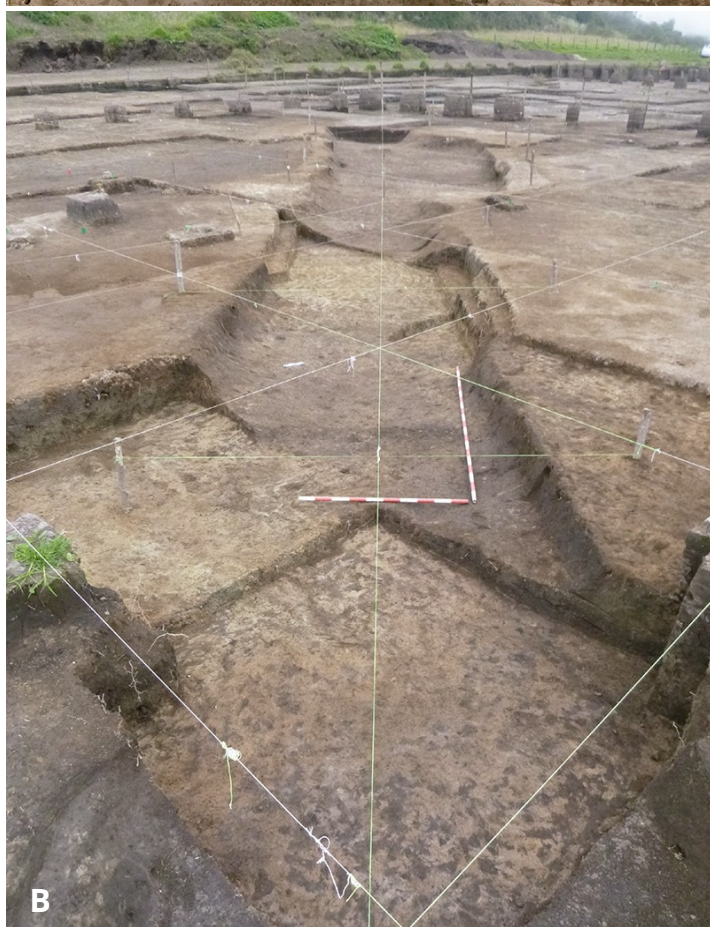


Figure 9. The channel used for hydraulic water management in the village of Nueva Esperanza. A) Aerial photo with the channel highlighted. B) View of the channel during the excavation process (Romano, 2018a: 78, 79).

(Rodríguez, 2022b). We observed a greater increase in both agricultural and artisanal productivity, associated with a higher population density and a more complex division of labor. Of special interest was the expansion of agriculture, where technologies such as fertilizers, irrigation systems, and raised fields were enhanced.

Thus, for example, in the Nueva Esperanza village, farmers continued to use a high amount of fertilizers in the hondonadas agricultural system, and certainly also in their home gardens, to produce, in a more intensive way, the four domesticated plants that were the basis of the Late Herrera populations' diet: maize, beans, squash, and quinoa. Analyzing the agricultural system of the hondonadas, Arroyave and Buriticá suggest two important conclusions. First, the hondonadas were areas of anthropic origin, used for food production, which were part of a domestic economy during Early Herrera, and of a political economy, characteristic of societies with an intermediate level of hierarchization, such as Late Herrera. They also advance the hypothesis of differential land use associated with certain domestic units in the village. In other words, the possible specialization in agricultural production of some domestic units (Hc1), in order to generate surpluses, which were appropriated by some lineages of the village (Arroyave y Buriticá, 2016: 400-402).

Moreover, some chiefdoms in the Suba and Cota sectors of the Bogotá Savanna intensified their agricultural production using the raised fields or camellones. An excellent example is the camellones of La Filomena 2 and Guaymaral, which were in operation for about 500 years, between the 5th and 10th centuries AD. The first evidence of intensive agriculture at La Filomena 2 is dated to the 5th century AD (AD 440±40), while the second corresponds to the 10th century (AD 920±40). Meanwhile, the intensification of agricultural activities in the Guaymaral camellón date from the 6th century AD 580±40 [5] (Boada, 2006: 104, 108) (Figure 10).

The radiocarbon dating of the camellones of La Filomena 2 and Guaymaral opens the discussion on the intensification of agricultural production among the chiefdoms of the Bogotá Savannah and its origin in time. If we assume that the development of productive forces, and in particular, the intensification of agriculture is one of the important variables at the economic level to identify hierarchical chiefdom societies, then agricultural technologies such as raised fields should have been introduced by the farmers of the first chiefdom society of the Cundiboyacense Altiplano, the Late Herrera society, and developed by the peasants of the Muisca society.

Agriculture and food plants

The Late Herrera communities implemented a mixed economy, based on agriculture, which was practiced on a regular basis. They implemented two complementary agricultural systems: *vegeculture*, especially of high-altitude tubers, and *semiculture*, with seeds, especially maize and beans. These two agricultural systems constituted the economic base of the Late Herrera society. Thanks to paleobotanical studies carried out with plant materials, especially microrests (pollen and phytoliths), macrorests (seeds) and starches, we know that the inhabitants of Nueva Esperanza intensively cultivated and consumed corn (*Zea mays* cf. var. Pollo), beans (*Phaseolus vulgaris*), squash (*Cucurbita sp.*, and quinoa (*Chenopodium quinoa*) (Rojas, 2016: 321, 325, 327). This was corroborated by stable isotope analysis of 14 skeletal remains, which showed a photosynthetic pattern of C4 plants (Carrillo, et al. 2016: 89, Table 6.13).

In the same way, the populations of the northern sector of the Cundiboyacense Altiplano used a similar group of plants, as demonstrated by the study of phytoliths in the teeth of a group of 15 individuals who lived in the village of Monquirá in Sogamoso (Boyacá) in the 2nd century AD (AD 190±40). The analysis allowed the identification of maize (*Zea Mays*), beans (*Phaeolus vulgaris*), amaranth (*Chenopodium ambrosioides L.*), broad beans (*Viciafoba L.*), pumpkin (*Cucurbita máxima Duchesne*), tomato (*Solanum lycopersicum L.*), guascas (*Gasilonga parviflora Cav.*) and curuba (*Passifloracea*) (Aldana, 2017: 46, 47).

Intensification of hunting activities

During the Late Herrera society, activities related to hunting and fishing were also intensified. In the case of the Nueva Esperanza village, the population increase was directly related to the intensification of the exploitation of fauna for food, even though, in general terms, we can speak of a certain stability and sustainable management of these resources. In this village, inequality in access to the meat of certain animals such as deer (*Odocoileus virginianus* and *Mazama rufina*) was observed. Indeed, the analysis of zooarchaeological materials suggests that among all the domestic units of the village, those grouped in areas 1 and 2 had access to the best cuts of meat (Castro y Beltrán, 2016: 421).

We can observe a similar situation in the village of El Venado, Boyacá, where hunting may have been a specialized mode of work. Household units LH-1 in the El Recuerdo neighborhood, LH-4 in the La Esmeralda neighborhood, and LH-10 in the Chávez neighborhood is where the greatest dependence on deer meat was noted, presumably consumed mainly by the elites of

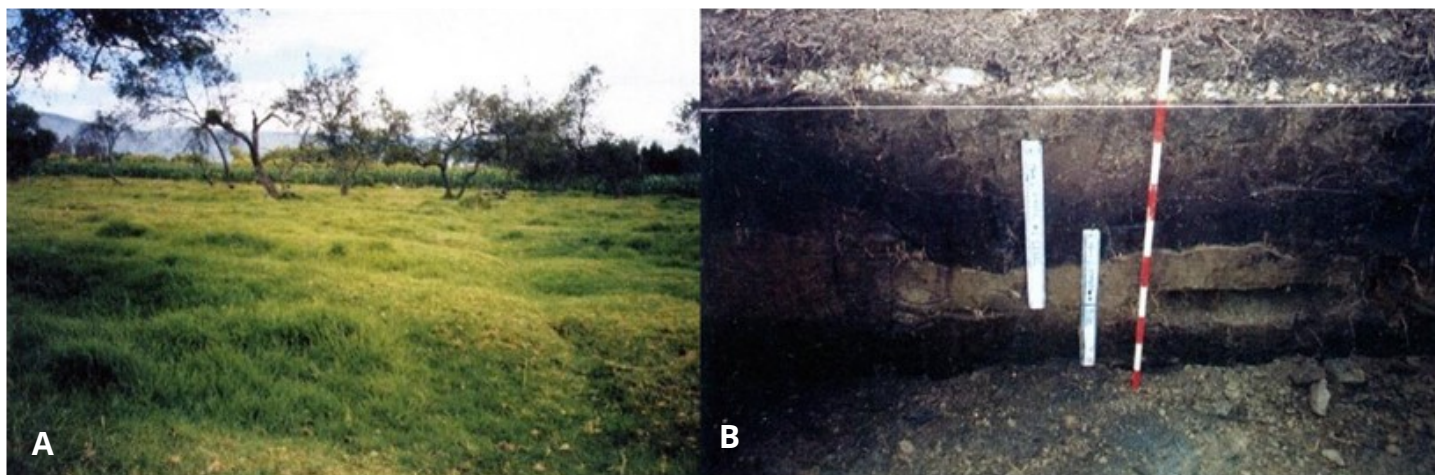


Figure 10. Raised fields agricultural system used by the Late Herrera farmers. A) Raised fields in La Filomena 2. B) Southern profile of Guaymaral Cut 1 (Boada, 2006: 104, 106).

these neighborhoods. Also of great interest, in relation to the differential access to meat resources in this village, were the higher proportions of the best cuts, and the greater variety of species found in domestic units LH5 and LH6, located in the northwest of the La Esmeralda neighborhood. These units are considered the richest and most high-status of the entire El Venado village (Boada, 2006: 102-104).

The increase of craft production

As in the Early Herrera period, the communities of the hierarchical-chieftdom Late Herrera society, mainly engaged in two productive activities: the production of food goods and the production of non-food goods, or handicrafts, including ceramic manufacture. These two social activities were involved in the economic cycle of production-distribution-consumption-exchange (barter). In this new stage of development of the Herrera communities, a greater amount of surplus was generated, which came from agriculture and the different handicrafts.

Pottery production

Pottery is one of the most important craft activities of ancient societies. The study of the technological, formal, and stylistic properties of pottery allows us to obtain information on a great variety of social and cultural aspects: cultural identity, cultural interaction, levels of development of pottery production, chronology, and political and ideological social hierarchies. It represents, then, one of the main archaeological sources for the study of pre-Hispanic socio-cultural processes in time and space (Duistermaat, 2017; Berdnikov & Lojov, 2014).

According to the classification proposed by Boada & Cardale de Schimpff (2017), the Late Herrera pottery complex basically consists of seven ceramic types, three of them corresponding to the so-called Intermediate

Herrera Period (AD 200-700), and four to the Late Herrera period (AD 700-1000). The intermediate period corresponds to the beginnings and consolidation of the Late Herrera society, while the late period refers to the last three hundred years of its existence.

Late Herrera pottery in the south of the Cundiboyacense Altiplano: The Bogotá Savannah

As stated by Boada & Cardale de Schimpff (2017), the main types of the Late Herrera pottery complex in the Bogotá Sabana, are the following: Funza Fine Quartz (FFQ) from the Intermediate Herrera and Late Herrera periods, Tunjuelo Laminar (TL) from the Intermediate Herrera and Late Herrera periods, Funza Abundant Quartz (FAQ), Guatavita Grey Tempered (GGT) and Tempered Sherds Salt (TSS).

The Funza Fine Quartz (FFC) type of the Intermediate Herrera Period

The paste of this ceramic is dark brown or gray or has a gray core. It is soft with a homogeneous and laminar structure. Its temper is ground sherds (chamotte) and medium-sized particles (1-3 mm) of gray, white, and red rock. The surface is well-smoothed. The techniques used for its decoration are orange or brown paint applied on both surfaces of the vessels, incision and sgraffito. Usually, the designs are geometric (points, triangles, rectangles, arranged in a lanceolate or oblique parallel form). Likewise, zigzag designs appear on the lip of the vessels and parallel painted stripes. Some bowls have anthropomorphic decoration, applied on the rim.

The most common forms are simple hemispherical bowls and composite silhouette (aquillados), open, closed, globular vessels, everted neck vessels, pots, pitchers, basket-shaped vessels. Anthropomorphic figures were also elaborated (Boada & Cardale de Schimpff, 2017a: 44-57) (Figures 11, 12).

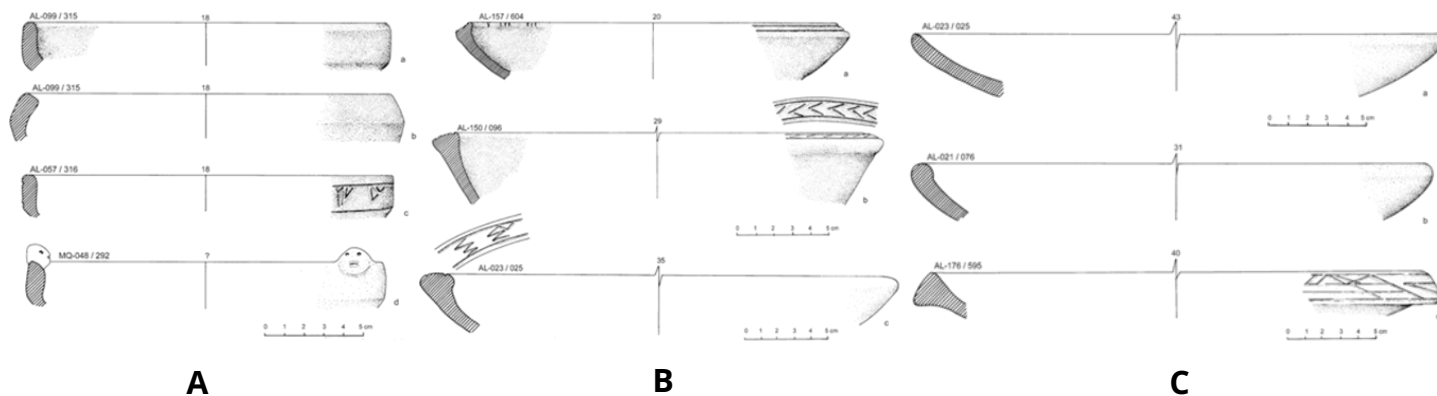


Figure 11. Forms of vessels of the FFQ type of the Intermediate Herrera. A) Hemispherical bowls. B) vessels with everted neck. C) Dishes (Boada & Cardale de Schrimppff, 2017a: 45-46, 56.)

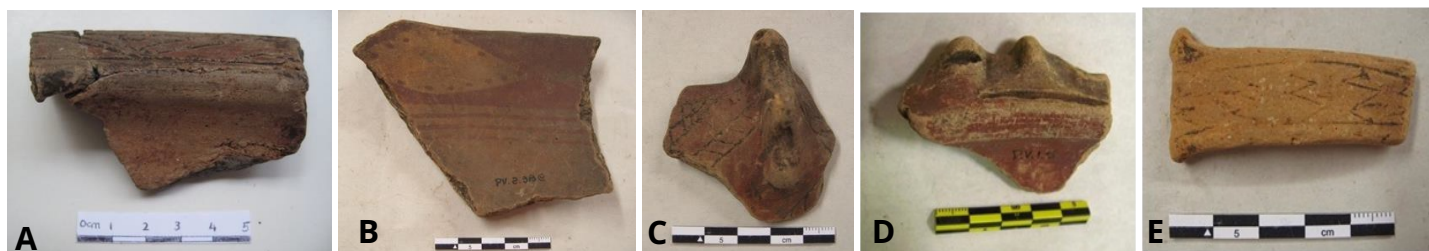


Figure 12. Decorated fragments of vessels of the FCF type from the Intermediate Herrera. A and B) Fragment of a bowl with positive painting and geometric designs. Site Pueblo Viejo, Facatativa PV-2-3BC. C) Stylized face with representation of nose and nose ring in a bowl. Pueblo Viejo site. D) Anthropomorphic face, Pueblo Viejo site. E) Fragment of a bridge handle of a basket-type vessel. Site, Facatativá 2 (Boada & Cardale de Schrimppff, 2017a: 50, 53, 57).

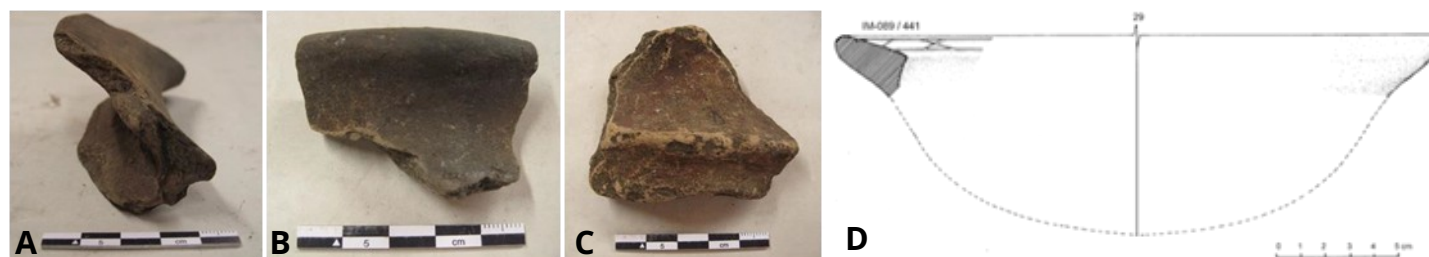


Figure 13. TL-type vessels. A) Fragment of the upper part of a pot, Pueblo Viejo site. B) Pot rim. C) Fragment of pitcher, Pueblo Viejo site. D) Single bowl with everted rim (Boada & Cardale de Schrimppff, 2017a: 58, 59).

The Tunjuelo Laminate type (TL) of the Intermediate Herrera Period

The TL is a type that appears during the Intermediate Herrera period (AD 200-700) but becomes popular in the Late Herrera period (AD 700-1000). The technological and decorative attributes of this type are similar for both the Intermediate and Late Herrera periods and will be described at length later when we discuss the TL of the Late Herrera period. The forms identified are open bowls with everted rims, pots with short necks and everted rims, and pitchers (Boada & Cardale de Schrimppff, 2017a: 50, 53, 57) (Figure 13).

The Funza Fine Quartz (FFQ) type of the Late Herrera Period

The technological and decorative attributes of this type, which appeared in the Early Herrera period, are the same for the Late Herrera period when it had its greatest development. The bowl forms of this type exhibit the greatest variety of shapes, which include

simple hemispherical, open, and closed compound silhouettes. The other forms included dishes, some of which were provided with handles and others with spouts; pitcher; and pots with both vertical and everted necks. The decorations are practically the same as the type already described for Early Herrera (Boada & Cardale de Schrimppff, 2017a: 61-69) (Figure 14).

The Funza Abundant Quartz type (FAQ)

The paste of this type has a granular, compact, and hard structure, with abundant quartz sand and occasionally ground potsherds. The particle size is fine (up to 1mm). The most commonly used decoration was red paint, while incisions are less frequent. Among the most characteristic forms, are simple hemispherical bowls with reinforced rims, keeled bowls, vessels with everted necks and rims, dishes, and basket-shaped vessels (Boada & Cardale de Schrimppff, 2017a: 69-74) (Figure 15).

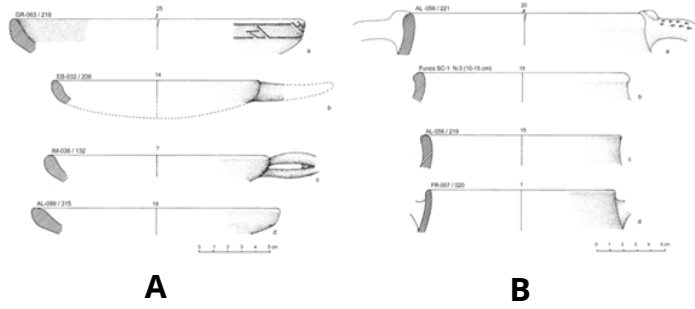


Figure 14. Type FFQ vessels from the Late Herrera period. A) Bowls with and without handles. B) Vertical neck pots (Boada & Cardale de Schrimppff, 2017a: 67-68).

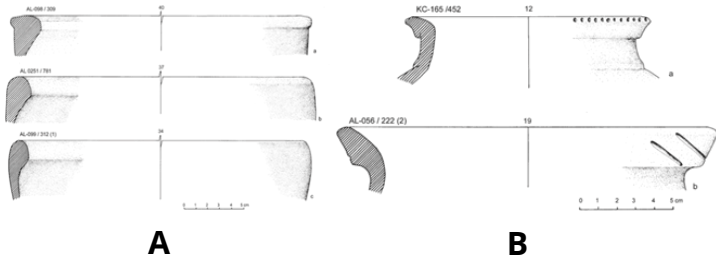


Figure 15. Vessels of type FAQ type. A) Hemispherical bowls with reinforced rims; B) Vessels with an everted neck (Boada & Cardale de Schrimppff, 2017a: 71, 74).

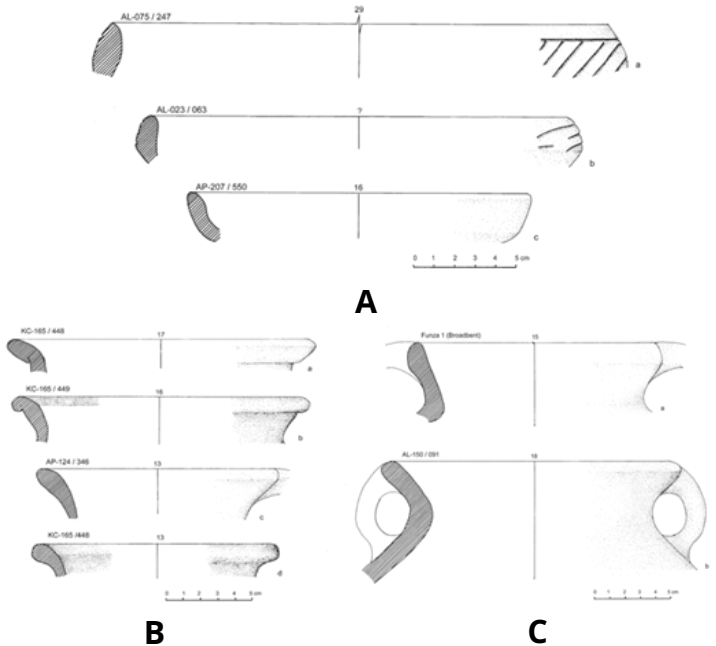


Figure 16. Vessels of the TL type of the Late Herrera period. A) Composite silhouette bowls. B) Vessels with neck and everted rim. C) Pots with handles (Boada & Cardale de Schrimppff, 2017a: 77, 82, 86).

The Tunjuelo Laminate (TL) type of the Late Herrera Period

This type has a coarse laminate paste structure with irregular fracture. It has a tan and dark brown, gray, and orange colors. The moderately abundant temper is made up of particles of black, gray, red, cream, and ground potsherd (0.2-1.6 mm). Decoration includes incising and red paint. The designs include rows of incised dots. Common forms are simple hemispherical, compound silhouette bowls, globular vessels, pitchers,



Figure 17. A ceramic miscellany of the TL type of the Late Herrera period. A) Simple hemispherical bowl with red paint. Museo del Oro, C-12614. B) Pitcher, Museo del Oro, CM-771. C) Dish, Tocancipá Site. Gold Museum, No. 13486. D) Moccasin-type vessel. Museo del Oro, CM-3471. E) Small cylindrical vessel with a lid, for making offerings. Gold Museum, CM-10993. F) Medium cylindrical vase, with anthropomorphic representation. Museo del Oro, CM-2353 (Boada & Cardale de Schrimppff, 2017a: 78, 83, 87).

vessels with various neck shapes, pots with and without handles, dishes, moccasin-type vessels, and cylindrical offering vessels (Boada & Cardale de Schrimppff, 2017a: 74-88) (Figures 16, 17).

The Guatavita Grey Tempered type (GGT) of the Late Herrera Period

According to Boada & Cardale de Schrimppff de Schrimppff (2017a: 88), this ceramic type appears during the Late Herrera period but becomes popular during the first phase of Muisca society (Early Muisca). The paste is of compact structure, hard, and of pink, gray, or carmelite colors. Usually, the temper is river sand with

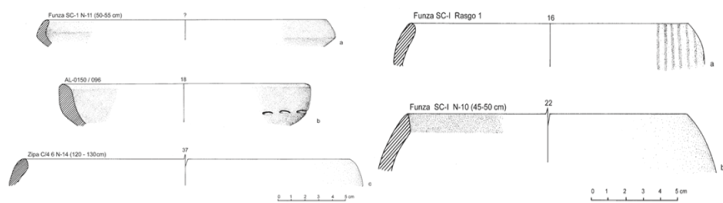


Figure 18. Vessels of the GGT type from the Late Herrera period. Closed hemispherical bowls (Boada & Cardale de Schrimppf, 2017a: 77, 88).

lenticular particles (.5-1mm) of gray, white, or crushed rock. The surface of the vessels is smoothed. The decoration includes stripes of positive red paint on the vessels and white on the anthropomorphic figures, used as rattles, and also the use of incision and geometric designs (Figure 18).

The type of Tempered Sherds Salt (TSS)

This type corresponds to bell-shaped vessels, used for salt evaporation. It has a compact and hard paste of gray or pinkish color. As a temper, it presents ground sherds in abundance (Boada & Cardale de Schrimppf, 2017a: 89).

Late Herrera ceramics in the pre-Hispanic village of Nueva Esperanza

As in other archaeological sites of the southern Cundiboyacense Altiplano, in the village of Nueva Esperanza, during the Late Herrera period (AD 200-1000), there was a higher population density, which was evidenced by the great increase in ceramic production in comparison to the previous Early Herrera period. Of the seven ceramic types related to the pottery complex of the Late Herrera society in general, three are represented in the two excavated sectors of the village of Nueva Esperanza (Argüello, *et al.* 2019; Rivas, 2020b: 70-71; Calderón, 2020: 141-142, Tabla 4). In the first sector the greatest number of sherds were identified as FQA, with a total of 69,542 fragments recorded, and FFQ, with 55,380 fragments; a smaller amount of ceramic fragments from the site were of the TL type (Argüello, *et al.* 2019: 47, Table 8). According to the radiocarbon dates obtained from the site, these types are roughly pertinent to the period between AD 670 and 1160, i.e., the terminal phase of the Late Herrera society. As for the forms, these included pitchers (jugs) with one handle, pots with two handles, bowls, and cups (Calderón, 2016b: 26) (Figure 19).

Based on the results of thin sections of sherds of the different ceramic types, Calderón (2016b), has recently suggested that the presence of the FCA type in the Nueva Esperanza village, may be due to two reasons: either the procurement of foreign raw material, by the potters of the village, or the exchange of manufactured vessels with villages in other areas.



Figure 19. Pitchers and pots of the Late Herrera period found in the Nueva Esperanza village: A) Simple pitcher, without handle, a form that is common in the TL type. B, C) Pitchers with one handle. D) Pot with two handles, characteristic of the TL and FFQ types (Romano, 2018a, 93-94, 97). E, F) Simple silhouette bowls, decorated with paint. H) Simple bowl decorated with a row of dots and zoomorphic appliqués (?) on the rim, possibly of type GGT. I) Basket-shaped vessel, which corresponds to a simple bowl with a bridge handle. This form seems to be characteristic of ceramics of type FFQ (Romano, 2018a: 94-96, 97).

Anthropomorphic figurines

The pottery artisans of the Late Herrera society also elaborated hollow, rattle-type anthropomorphic figures (men and women) (Boada & Cardale de Schrimppf, 2017a: 88-89). Some of them correspond to the GGT ceramic type, and their style, surely of local origin, presents some similarities with the Middle Magdalena figures but differs substantially from the later Muisca style, which could suggest their belonging to two different archaeological cultures. According to the authors, this type of human representation could have been first manufactured during the Intermediate Herrera period (Boada & Cardale de Schrimppf, 2017a: 89) (Figure 20).

Some of these hollow figures are very similar formally and stylistically to those manufactured by the pottery artists of the Late Quimbaya 1 society (AD 500-1300). Specifically, with those found in tomb 3 of the pre-Hispanic cemetery of Guabas, in the Cauca Valley, which was dated to AD 1120±110, and was part of the

grave goods of an elite individual (Rodríguez, *et al.* 2006: 21 Fig. 4, 142, Fig. 62). It is very likely that these anthropomorphic figures were not of local manufacture, but obtained by exchange with chiefdom societies of the Middle Cauca region. The hollow form, the position of the hands on the chest, the semi-triangular head, and the applied "coffee bean" eyes are very typical of figurines from the Middle Cauca Geohistoric Region (Figure 21).

Zoomorphic figures

With the Late Herrera period of the village of Nueva Esperanza, we can also associate the production of hollow zoomorphic figures, whose body is decorated with stripes of red paint. It is likely that these representations of quadrupedal animals, would have been used in certain rituals of religious type (Romano, 2018a: 97).

Late Herrera pottery in the northern Cundiboyacense Altiplano: The village of El Venado, Samacá Valley, Boyacá

In the pre-Hispanic village of El Venado there were three occupations of tribal societies: one corresponding to the egalitarian tribal society Early Herrera and two of hierarchical tribal societies of chiefdom type Late Herrera and Muisca. With the Late Herrera society, we could associate the types GGT and Polished Orange (NP) (Boada, 2007a, 232-236). Both types are associated with simple and tapered bowls, which present positive red paint as decoration. In some bowls, the paint covers the upper external part of the body, while in others, it appears in thin and thick vertical bands (Boada, 2007a: 231, Figure A.6). Similar bowls with vertical bands of red paint have occurred in the Bogota Savannah, related to FFQ and GGT types (Boada & Cardale de Schrimppff, 2017a: 73, Figure 6,23: c; 88, Figure 6,58: a). Other typical form is jars with everted necks without handles (Boada, 2007a: 68).

Textile production

The study of textile production is of great importance to understanding the development of the economic complexity of ancient societies. The intensification and emergence of workshops as spaces of artisanal production, as well as new forms and weights of spindle whorls in this instance, announce new social relations and unprecedented forms of social complexity (Marín-Aguilera, 2019).

Textile production in the village of Nueva Esperanza

Textiles, especially blankets, were objects of great value that were not only used by the community but were also exchanged. During the Late Herrera period, in



Figure 20. A hollow anthropomorphic figure, with white paint. San Francisco Site. Colombian Institute of Anthropology and History- C-DF-T7-1 (Boada & Cardale de Schrimppff, 2017a: 89).



Figure 21. Anthropomorphic figures decorated with red paint, from the Nueva Esperanza village. A) Is likely a copy of local manufacture, while B and C, due to their stylistic characteristics, come from the Middle Cauca and were obtained by exchange (Romano, 2018a: 132)

the Nueva Esperanza village, textile production reached a high level of development and was practiced by women, probably on a part-time basis. If we analyze the technological change that occurred in the spindle whorls, then we can infer a certain specialization in the spinning activity, reaching even a high degree of standardization of production.

In general, during the archaeological excavations at Nueva Esperanza, several types of objects associated with textile activities, made on vertical looms, were found: needles, spatulas and awls made of bone, and stone spindle whorls. (Rivas, 2020c: 276). In the first phase of the excavations, 656 spindle whorls were recovered, of which 29 corresponded to the Early Herrera society, 140 (the majority) to the Late Herrera society, and 41 to the Muisca society (Jaramillo, 2016: 36 -37). In the second phase of the excavations, 483 spindle whorls were recovered, belonging to the three periods already mentioned (Rivas, 2020c: 276). [6]

The most common shapes of spindle whorls from the Late Herrera period, which were made of stone, are 1) discoidal (the highest percentage), with diameters from 2.95cm - 6.20cm and weights between 6-11 grams,

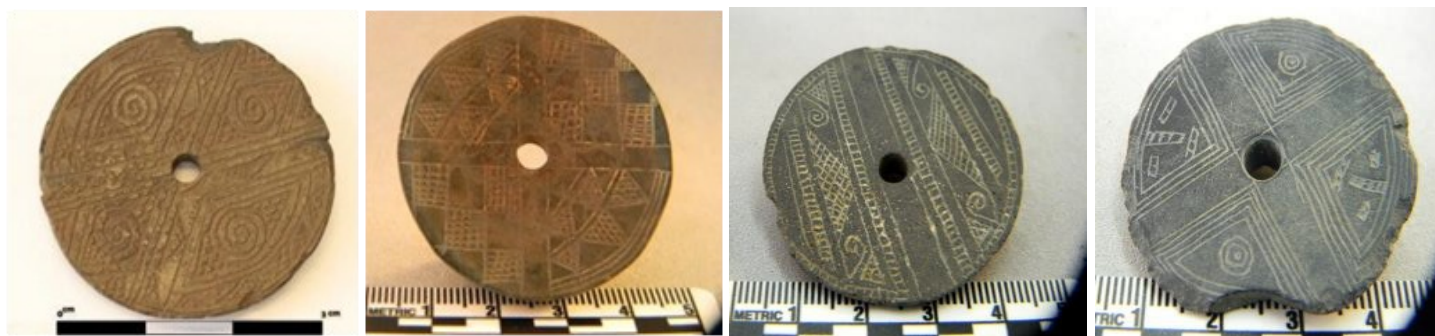


Figure 22. Stone spindle whorls of the discoidal body with geometric decoration, from various Late Herrera tombs from Nueva Esperanza (Jaramillo, 2016, 37; Marulanda, 2015: 21).

that exhibit incised decoration consisting of geometric (triangles, circles, spirals, rhombuses, and squares), zoomorphic and anthropomorphic motifs; 2) flattened cylindrical, with an average diameter and weight of 3.4 cm and 12 grams, that are decorated with geometric designs; 3) sub-globular, with an approximate diameter of 2.5 cm and weight of 13.5 grams primarily decorated with geometric designs; and 4) truncated conical whorls, with an approximate diameter of 2.5 cm and weighing 13.5 grams. This last shape exhibits incisions forming triangles, rectangles, spirals, and rhombuses (Jaramillo, 2016: 39; Marulanda, 2015: 21) (Figure 22).

Of notable interest are the zoomorphic and anthropomorphic decorations on some spindle whorls, which could be considered power icons of the ideological (animals) and political (humans) elites that were used by the village elites to sustain and promote power. Specifically, the anthropomorphic decoration is noted on the body of the discoidal shaped spindle whorls. In figure 23a, the head of an individual, possibly a shaman, represented by a quadrilateral, where the eyes, nose, and mouth can be seen. On top of the head, four incised triangles could symbolize the radial crown, characteristic of individuals with great ideological-religious power (shamans). Likewise, in figure 23b, the head of an individual was represented with a radial headdress, which is inside a triangular figure, a design that was possibly repeated four times.

Some of the spindle whorls found in Nueva Esperanza appeared in tombs with oval-shaped shaft and niche, and were part of the grave goods placed on the buried individuals, especially children, youths and adults (women?). For example, a spindle whorl of globular shape, with incisions forming triangles and squares was the only grave good associated with a 5-year-old child buried in grave 3 of Cut E51 (Romano, 2018b. Anexo. Base de Datos sobre Volantes. N° 468.). A young individual (female?) found in an extended dorsal position, buried in a grave excavated in the same cut, had two spindle whorls placed on the pelvis, which could indicate that when alive, this person could have been engaged in textile activities (Romano, 2018b. Anexo. Base de Datos sobre Volantes. N° 466 y 467).



Figure 23. Spindle whorls with discoidal body, which have anthropomorphic decoration, from several Late Herrera tombs from Nueva Esperanza (Jaramillo, 2016: 38, 52).

Another individual (female?), who was between 18 and 25 years old when she died, and who was buried in tomb 8 of the same cut, was given a necklace made of quartz and green stone beads, as well as a spindle wheel with triangle and spiral designs (Romano, 2018b. Anexo. Base de Datos sobre Volantes. N° 56).

It seems that textile activities, with which standardized production and the spindle whorls are associated, were concentrated in the northeastern sector of the village, where seven production sites existed (Romano, 2018a: 88-89). This area is associated with identified as domestic spaces used by the dominant lineages of the community. In other words, elites were likely the ones who controlled textile production and accumulated material wealth, exchanging objects made of cotton, with communities, both from the Cundiboyacense Altiplano, as well as from the Middle Magdalena and Middle Cauca Medio regions (Jaramillo, 2016: 49).

In summary, the archaeological data from the pre-Hispanic village of Nueva Esperanza suggest an intensification of textile production during the Late Herrera period, associated with the standardization of production. It is likely that the use, preferably of medium-sized spindle whorls of discoidal shape, with homogeneous diameters and weight, is indicating the production of medium-sized yarns. That is a kind of economic reorganization (political economy), tending to the production of surpluses for exchange, which was controlled by the dominant lineages of the village (Jaramillo, 2016: 41, 46, 57).

Textile production in the village of El Venado

Another important example that should be mentioned with respect to textile production is that of the village of El Venado, in Boyacá (northern sector of the Cundiboyacense Altiplano), where stone spindle whorls and bone needles were found. Although the archaeological sample obtained is minimal (only seven spindle whorls, six elaborated in stone and one in ceramic, and one bone needle), the context of these finds presents an interesting comparison with Nueva Esperanza. Most of these objects were found in the La Esmeralda neighborhood, where textile production was concentrated in the village and where the elites who concentrated economic power also resided. However, in other neighborhoods of the site, such as San Antonio and El Recuerdo, textiles also appear to have been produced, though in a more modest way possibly aimed at satisfying the needs of the village.

It appears that spindle whorls were very precious possessions during life and accompanied the dead on their journey to the "afterlife". At least, this was the case of an adult who was about 48 years old at death, who lived in the La Esmeralda neighborhood and was buried in a simple, oval-shaped shaft tomb (Tomb 17). His grave goods consisted of a spindle whorl placed on the thorax, an armadillo shell, and a necklace composed of six agouti paca teeth (Boada, 2007b: 62).

Concerning the textile production of several household units in the La Esmeralda neighborhood, Boada (2007a, 148) suggests that: "In La Esmeralda, however, households may have engaged in a more intensive production of cotton yarn that far exceeded the needs of the household unit." (emphasis added). Such production may have been for the weaving of blankets, which were exchanged for social benefits such as those documented by ethnohistoric sources. It was precisely the La Esmeralda neighborhood, the sector where the richest residential units of El Venado village were located, that also produced archaeological evidence suggesting the development of exotic ceramic exchange with other villages (Boada, 2007a: 146).

Thus, textile production was one of the substantial artisanal productive activities implemented and developed by the Late Herrera communities. As we have already noted, its intensification and the production of surplus blankets and other cotton garments may have played a crucial role in the emergence and establishment of the social hierarchies that appeared during the Late Herrera period (Jaramillo, 2016: 30). In this sense, I think that Boada (2009: 273-73) is correct in considering that pre-Hispanic textile production in the Cundiboyacense Altiplano created and maintained prestige and power among the caciques, fostering the hierarchization of society.

Conclusions

The three cultural variables analyzed holistically above provide clear evidence of the level of complexity reached by the Late Herrera populations of the Cundiboyacense Altiplano during the different periods of their social and cultural development. This level or degree of complexity was very different from that achieved by the preceding level 3 of Early Herrera society. In table 1, I present a comparative analysis of some of the variables studied that allows us to observe the qualitative differences between the four societies compared. If we analyze the variable of settlement patterns, we observe that the complexity increases as the type of society changes. For example, while level 1 societies were characterized by a domestic sedentary lifestyle, level 2 societies implemented a slightly more complex sedentary lifestyle, combining both domestic and funerary sedentary lifestyles. Meanwhile, level 3 societies were organized in permanent villages, that were expanded during level 4, due to higher population density.

A new important turning point occurred in the architectural structures variable. From natural shelters such as rock shelters (level 1), we moved to circular, semi-oval, and beehive-shaped dwellings, built outdoors (level 2) and circular bohios for living, and half-shaped moon structures, used for craft activities (level 3). In level 4, large bohios were built, as well as large architectural dwellings of the maloca type, all associated with the emerging social inequalities.

However, if we analyze the primary production activities variable, we can also observe important qualitative changes related to the emergence of new "emerging" properties. Level 1 populations had an appropriating mode of production (hunting, fishing, gathering), while the characteristic of level 2 society was the early mode of food production (horticulture), and of level 3 society, the regular mode of food production (agriculture), which began to generate surpluses. At level 4 we can observe the intensification of primary food production, thanks to the development of agriculture driven by the construction of raised fields, canals, and the use of fertilizers. Similarly, we can observe important changes in relation to the variable of craft activities. The lithic industry of hunter-gatherers was very simple, in accordance with hunting, fishing, and gathering activities, while level 2 populations developed new lithic production tools, in accordance with the new needs of producing and processing plant species. On the other hand, the handicraft activities of the level 3 populations became more complex as they introduced, in addition to regular agriculture, productive branches such as pottery and textiles, which generated a good amount of surplus products. Meanwhile, during

Table 1. Comparative analysis of some variables of sociocultural complexity that were present in the prehispanic societies of the Cundiboyacense Altiplano.

LEVELS OF INCREASING COMPLEXITY	SETTLEMENT PATTERNS	ARCHITECTURAL STRUCTURES	PRIMARY PRODUCTION ACTIVITIES	CRAFT ACTIVITIES
Fourth level - Late Herrera	<ul style="list-style-type: none"> - Increase in population density. - Dwelling in permanent villages. 	<ul style="list-style-type: none"> - Circular Bohio-type dwellings. - Half-moon shaped spaces for craft activities. - Large rectangular dwellings of maloca type. - Bahareque as a construction technique. - Use of pozzolans. - Structures associated with hydraulic water management. 	<ul style="list-style-type: none"> - Intensification of primary food production. - Agricultural intensification (raised fields, hondonadas, fertilizers, channels). - Permanent polyculture agriculture. - Improvement of hunting, and fishing. 	<ul style="list-style-type: none"> - Increase and standardization of the craft production. - Lithic workshops. - Pottery production. - Textile production. - Rise of the goldsmith's craft.
Third level - Early Herrera	<ul style="list-style-type: none"> - Increase in population density. - Circular Bohio-type dwellings. - Half-moon shaped spaces for craft activities. - Bahareque as a construction technique. - Use of pozzolans. 	<ul style="list-style-type: none"> - Increase in population density. - Dwelling in permanent villages. - Semi-permanent in farms. - Stone floors. 	<ul style="list-style-type: none"> - Regular mode of food production. - Household economy. - Permanent polyculture agriculture. - Hunting, fishing, gathering. 	<ul style="list-style-type: none"> - Lithic workshops. - Pottery production. - Textile production. - Production of bone objects.
Second level - Early hunter-producers	<ul style="list-style-type: none"> - Mixed inclusive sedentism: domestic and funerary. 	<ul style="list-style-type: none"> - Mixed inclusive sedentism: domestic and funerary. - Semioval, circular and beehive-shaped dwellings. - Stone floors. 	<ul style="list-style-type: none"> - Early mode of food production. - Economy of reproduction. - Polyculture horticulture. 	<ul style="list-style-type: none"> - New lithic industry for vegetable processing. - Hoes, boulders with worn edges, anvils, tappers, grinding plates.
First level - Hunter gatherers	<ul style="list-style-type: none"> - Housing in rocky shelters. 	<ul style="list-style-type: none"> - Sedentary domestic type. - Housing camps. 	<ul style="list-style-type: none"> - Appropriating mode of production - Hunting, fishing, gathering of plants and animals. 	<ul style="list-style-type: none"> - Lithic workshops.

level 4, craft production was developed and standardized, and in addition to lithic, ceramic and textile production, goldsmith emerged.

Notes

[1] Regarding Spier's approach, it is necessary to clarify two aspects. First, his theoretical proposal includes, in addition to the concept of complexity, those of matter and energy. Since all the forms of complexity present in Big History have consisted of matter, all of them have needed energy flows for their emergence (Spier, 2011: 146-47). The second aspect is related to the existing levels of complexity and the differences between them. Grosso modo Spier considers that there have been three levels of complexity: the first level is the inanimate physical nature, the second is life and the third is culture (Spier, 2011: 151).

[2] During archaeological excavations conducted in large areas in the village of Nueva Esperanza, it was possible to identify 20 structures of different sizes: twelve circular plan dwellings, four rectangular constructions, and three half-moon shaped ones (Calderón, *et al.* 2015).

[3] If we take into account both the relative chronological data and the calibrated absolute dates (about 60 radiocarbon dates) that currently exist, we can chronologically place the Late Herrera society between the 2nd century AD and 10th century AD (Rodríguez, 2022a: 185-189).

[4] These rectangular structures were found in the cuts TCE04 (one structure), TCE06 (three structures), TCE17 (one structure) (Rivas, 2020a: 97-98, 101, 120).

[5] I think that the date of 12th century BC (1100±40 BC) from the Guaymaral camellón (Boada, 2006: 104) is very early for the beginning of permanent agricultural activities in the Cundiboyacense Altiplano. And it is unlikely that at this time the primary food producers of Early Herrera society would have implemented these highly productive agricultural systems.

[6] We do not know how many spindle whorls correspond to Late Herrera. Unfortunately, in his report on the textile activities carried out in Nueva Esperanza, Sebastián Rivas presents general data, not information on the spindle whorls by chronological periods.

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