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ARTICLE

A Chronological Model for Inca Provincial Expansion: The Case of the Copiapo Valley

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Abstract
This article examines a new dataset of radiocarbon dates that provides insights into the progressive installation of Inca infrastructure in the Copiapo Valley, situated at the southern edge of the Atacama Desert in northern Chile. It shows that the Inca imperial expansion in this region was not a linear process and was likely shaped by local negotiations and conflicts. The findings describe three main stages of Inca expansion. The first is the construction of the North–South Inca Road and the establishment of high-altitude mountain shrines. The next stage consisted of a physical intervention in a local village located in the upper valley, including the construction of administrative buildings and public spaces. The last stage involved indirect intervention in local villages, characterized by the presence of isolated administrative buildings that were potentially used for diplomacy and negotiation. I argue that the Inca imperial expansion, characterized by evolving strategies across regions and time periods, not only demonstrates the state's capacity for learning but also suggests the pivotal role of local actors in positions of power who wielded agency to shape these developments.

Resumen
Este artículo examina un nuevo conjunto de fechados radiocarbónicos que nos permite observar las etapas progresivas de instalación de infraestructura Inca en el valle de Copiapó, ubicado en el límite sur del desierto de Atacama, norte de Chile. La expansión imperial Inca aquí no aconteció como un proceso lineal, sino que fue probablemente modificada por medio de negociaciones locales y conflicto. Los resultados muestran tres etapas principales de expansión. Primero, construcción del camino Inca norte-sur y el establecimiento de los santuarios de altura en las montañas. Segundo, intervención física de una aldea local en la parte alta del valle, incluyendo la construcción de edificios administrativos con espacios públicos. Finalmente, intervención indirecta en aldeas locales y presencia de edificios administrativos aislados posiblemente destinados para diplomacia y negociación. Mi argumento es que la expansión imperial incaica y sus cambios estratégicos a través del tiempo y el espacio no son solo expresión de un proceso de aprendizaje del Estado, sino que también pudieron haber sido influidos por actores locales que estaban bien posicionados para expresar su agencia.

Keywords: Inca; infrastructure; chronology; agency; Atacama Desert

Palabras clave: Incas; infraestructura; cronología; agencia; desierto de Atacama

The construction and use of infrastructure were key features of the expansion of the Inca Empire, providing the means to extend the reach of the state throughout the Andes. The Inca circulatory and static infrastructure (see Wilkinson 2019a), including roads and centers for administration and logistics, was necessary for the expansion of the Inca political economy across the empire: it enabled the command of the labor force, management of local territories, production of prestige goods, and performance of state rituals and religion. Thus, this infrastructural power, or the ability of the state to extend its logistical capabilities into the realm of civil society (Mann 1984, 2008; Soifer 2008; Weiss 2006) was crucial to ensure Inca provincial rule.

Infrastructure, understood as a supra-household built landscape (Wilkinson 2019b), is not exclusive to state societies, although states possess greater capacity for its construction and use. The potential power of infrastructures lies in how they intensify the reach of the state, enable the implementation of political decisions, provide the means to extract revenue, and create relations of dependence (Slater and Fenner 2011). However, infrastructural power can have a dual nature. Although it consolidates state authority, it can also be subverted or reinterpreted by local populations for their own purposes, should they find creative ways to challenge and appropriate such power (Amin 2014; Chu 2014; Harvey and Knox 2015; Larkin 2013).

This article demonstrates how the planning and construction of Inca infrastructure for the imperial expansion in the Copiapo Valley in northern Chile did not adhere to a rigid plan. Instead, it was a dynamic process that necessitated adjustments and modifications. A new and robust set of radiocarbon dates from various sites in the region makes it possible to observe the sequential development of Inca infrastructure and its transformations during the Late Horizon period. I argue that these changes can be partially attributed to the responses of local people to political dominion, which can range from noncooperation and rebellion to active attempts at social integration and collaboration with the new Inca authorities (cf. Stark and Chance 2012).

Inca Provincial Infrastructure and Empire Building

The primary archaeological evidence of the Inca presence in Collasuyu, the southern province of the empire, is their administrative and economic infrastructure, which is closely linked to road networks (e.g., Berenguer 2009; Covey 2015; D'Altroy 2015; Hyslop 1984; Jenkins 2001; Salazar et al. 2022; Stehberg 1995; Uribe and Urbina 2009). Despite the modest nature of these infrastructures in comparison to those found in the central Andes, they played a crucial role in exerting effective dominance over local populations by controlling transportation routes, agricultural and mining activities, the distribution of prestige goods such as metal artifacts, and the performance of political rituals, among other functions (Hyslop 1984, 1990; Niemeyer 1986; Raffino 1982; Uribe and Sánchez 2016). The implementation of new infrastructure aided the Incas in extending their state's influence, allowing them not only to manage and command the local labor force but also to engage with the nonhuman elements of the landscape and incorporate local leaders and communities into their social hierarchy and principles through rituals (Acuto 2022; Alconini and Covey 2018; Chase 2018; Pavlovic et al. 2022; Salazar et al. 2022; Troncoso 2022).

In Chile, the success of Inca control has been largely attributed to the power of ideology and ritual practices (Berenguer 2009; Cornejo 1999; Uribe 2000, 2004). This ideology was manifested through the perception of Inca rulers as powerful and civilized builders; this perception was reinforced by the construction of imposing administrative structures and communal public spaces and by the observance of commensal activities and feasting in state facilities located at sites like Tarapacá Viejo, Yabricoyita, Cerro Colorado, Cerro Verde, El Abra, and Turi (Berenguer 2007; Pavlovic et al. 2012, 2019; Salazar et al. 2013; Uribe and Urbina 2009). Political commensality required the local production of staple finance, which facilitated the development of interdependent relationships among segments of society. In Alto Loa, for instance, the production of staple finance in Toconce, Paniri, and Talikuna necessitated a complex system of interconnection involving the Inca administration, local lords, herders, and agriculturalists. This system financed festivities and rituals associated with copper mining at locations like Cerro Verde, as well as the production of prestige goods that were consumed in larger villages and Inca administrative sites such as Turi (Berenguer and Salazar 2017).

Despite the significant political and symbolic impact of Inca infrastructure on small-scale societies, little attention has been devoted to understanding the degree to which local people truly embraced Inca political symbolism and physical intervention in their daily lives. As pointed out by Covey (2015), our knowledge about the Inca's imperial intentions, as evidenced by their infrastructure and Spanish colonial narratives, surpasses our understanding of the actual social outcomes within the empire's provinces. Although there are numerous studies on the mechanisms used by the Incas to expand their domains, less is known about the role of local populations' agency in shaping the outcomes of such mechanisms in the southern regions of Collasuyu (Uribe and Sánchez 2016).

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This article aims to contribute to the discussion of these infrastructures from a bottom-up perspective, examining the extent of local agents' participation in imperial projects (Chacaltana et al. 2010; Garrido 2016; Garrido and Salazar 2017). I focus on the dynamics of temporal and spatial changes in imperial strategies (see Stark and Chance 2012) as a way to explore potential deviations and modifications provoked by local agents. In examining the nature of these dynamics, I present a new chronology of the Inca occupation in the Copiapo Valley that shows how the sequence of Inca infrastructural deployment demonstrates different modes of interaction with the local population (Figure 1). I propose that the agency of provincial administrators and local people contributed to shaping the diverse forms of Inca administration in the distant provinces, where local communities confronted the challenge of establishing their position or facing exclusion from the new sociopolitical landscape of the Late Horizon.

The Inca Expansion in the Copiapo Valley

Copiapo Valley is situated in northern Chile at approximately 27° latitude south. It extends in a southeast–northwest direction from the Andes Mountains to the Pacific Ocean and marks the southern boundary of the Atacama Desert. As a biogeographical barrier, this desert contributed to the valley's isolation and shaped its unique sociocultural history. During the Late Intermediate period, the local population inhabited a series of small villages characterized by clusters of elliptical stone structures scattered across an area of approximately 1 ha. Notably, there is no evidence of a hierarchical settlement pattern in these communities (Castillo 1998).

Each community had its own independent leaders who possessed the ability to establish regional alliances for the purposes of diplomacy or conflict, as documented in sixteenth-century records (Garrido and González 2020). According to an early Spanish visit and census conducted in 1558, the population of Copiapo Valley was estimated to be around 1,400 individuals (Garrido and González 2020). This figure remained relatively stable until the foundation of Copiapo City in the mid-eighteenth century (Broll 1988). Although the local population might have been somewhat larger before the Spanish conquest, this number likely reflects the valley's carrying capacity, taking into account its self-sufficiency in terms of resources.

The local pottery in Copiapo Valley was characterized by the presence of Copiapo black on red bowls and large Punta Brava storage jars (Garrido 2011). These styles continued to be used during the Late Horizon period, along with Diaguita pottery and a local reinterpretation of Copiapo bowls incorporating Inca-style designs (Garrido 2018). Although the use of Inca-style pottery forms, such as *aryballos*, *aysana* jars, shallow plates, and *kero* cups, was generally limited in domestic contexts, they were more abundant in Inca buildings associated with public spaces. This suggests their role in facilitating commensal activities aimed at politically and symbolically integrating the local population into the social structure of the Inca Empire (Garrido and Morales 2019).

It is worth noting that in Copiapo Valley, the Incas did not establish imperial rule independently. Instead, they formed alliances with Diaguita groups residing in valleys located farther south of Copiapo. Diaguita pottery styles from the Inca period are prevalent in the Copiapo and Huasco Valleys, with no evidence of pre-Inca Diaguita pottery (Ampuero 1978; Castillo 1998; González 2000; Niemeyer et al. 1993). Therefore, earlier interpretations suggested that the Inca conquest in the region began with an alliance with the Diaguita polities residing between the Elqui and Limari Valleys, indicating a south-to-north progression (Berenguer 2009; Cornejo 2001; González 2013; Troncoso and Pavlovic 2013; Uribe and Sánchez 2016). However, the precise role of the Diaguitas in the consolidation of Inca rule in Copiapo and Huasco requires further investigation to understand the specific contributions of intermediate groups and elites within the Inca administration. In addition, the archaeological evidence suggests that Diaguita society was not a monolithic and centralized polity and their engagement and participation with the Inca administrators also likely differed geographically.

Understanding the Chronology and Process of Inca Expansion in Copiapo

To gain insight into the process of Inca expansion in Copiapo Valley—its contingencies, the geographical areas affected, and the infrastructure involved—I present a dataset of radiocarbon dates going from

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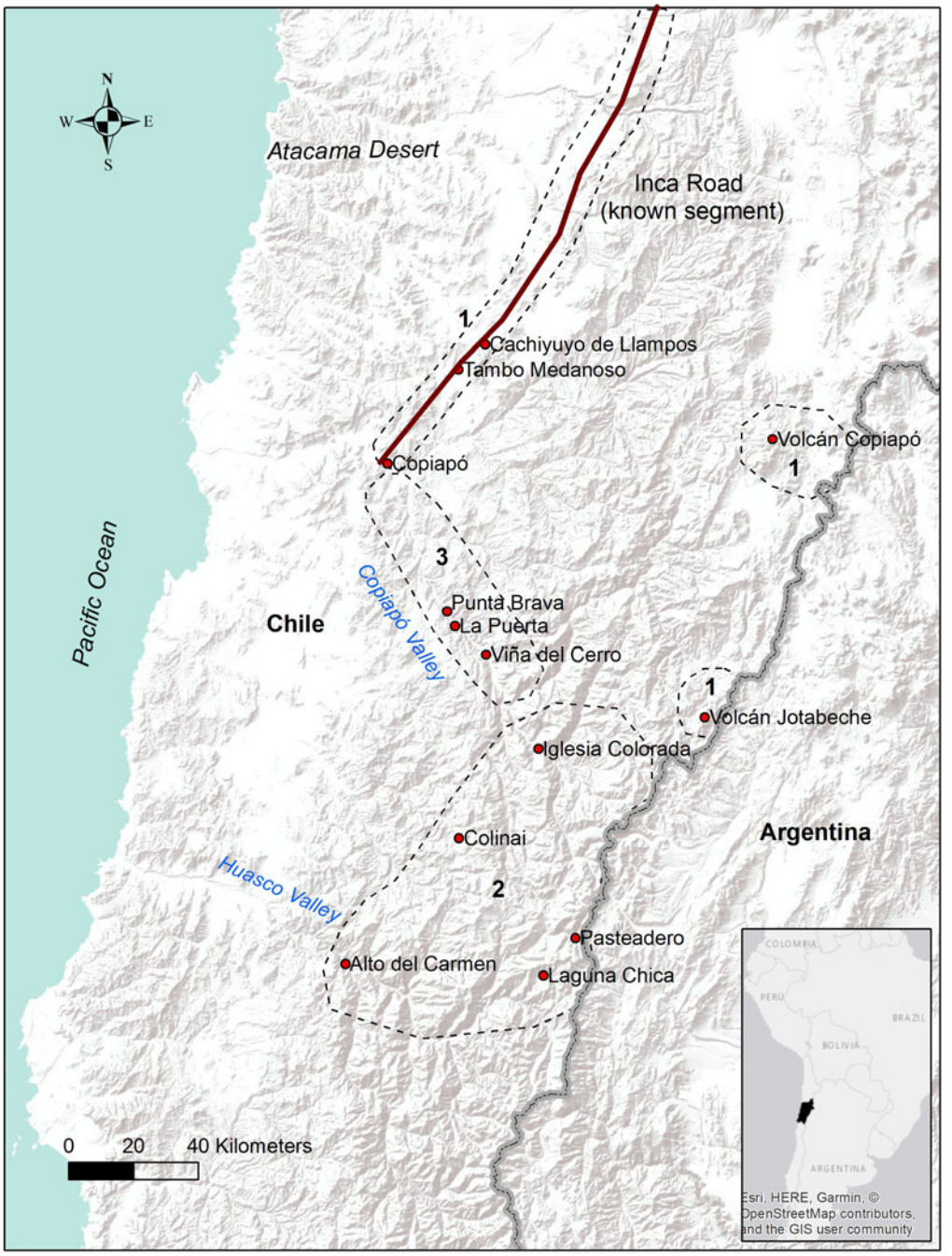

Figure 1. Map of the sites and places mentioned in the article. The Qhapaq Ñan or Inca Road is displayed as a red line, and the dashed polygons represent the expansion stages 1, 2, and 3. (Color online)

the early Inca occupation of the region to the early Spanish colonial period (Table 1). This dataset is supplemented with pre-Inca radiocarbon dates that offer evidence of earlier occupations at specific Late Horizon sites. The radiocarbon dates were processed between 2018 and 2020 at the Center for Applied Isotope Studies (CAIS) of the University of Georgia. They derive from collections held at the Museo Regional de Atacama (Copiapo) and Museo Nacional de Historia Natural (Santiago), as

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Table 1. List of Late Horizon Radiocarbon Dates from the Copiapo and Huasco Valleys.

N	Lab	Number	Site	Context	Material	Date BP	Error	SHCal20 95.4%	Reference
1	GAK	14044	Pasteadero	Structure 5, level 2	Charcoal	710	90	1189–1436	Stehberg 1995
2	AA	104031	Tambo Medanoso	Unit 1, level 2	Charcoal	719	34	1276–1394	Garrido 2016
3	GAK	14046	Laguna Chica	Unit 1, level 2	Charcoal	580	80	1284–1608	Stehberg 1995
4	UGAMS	48884	Copiapo Volcano	Platform A, Sector 2	Charcoal	650	20	1305–1401	Unpublished
5	UGAMS	36065	Iglesia Colorada	Burial 8, individual 1	Human tooth	630	25	1314–1414	Garrido and Morales 2019
6	UGAMS	48883	Jotabeche Volcano	Summit, east wall	Vegetable fibers	620	20	1320–1413	Unpublished
7	AA	104029	Tambo Medanoso	Unit 6, level 2	Charcoal	559	41	1324–1453	Garrido 2016
8	UGAMS	44099	Iglesia Colorada	Unit 2, level 18	Charcoal	590	20	1325–1440	Garrido and Morales 2019
9	UGAMS	44085	Alto del Carmen	Individual 3	Human tooth	580	20	1328–1435	Unpublished
10	UGAMS	44084	Alto del Carmen	Individual 8	Human tooth	560	30	1393–1449	Unpublished
11	GAK	14405	Colinai	West wall, level 3	Charcoal	460	80	1395–1647	Stehberg 1995
12	UGAMS	36071	Iglesia Colorada	Burial 9	Human tooth	560	20	1400–1440	Garrido and Morales 2019
13	UGAMS	36037	Rinconada de San Fernando	Burial	Human bone	560	20	1400–1440	Garrido and Morales 2020
14	AA	104028	Chinchilla 1	Unit 1, level 2	Charcoal	536	33	1401–1453	Garrido 2016
15	UGAMS	48888	Punta Brava	Unit 2, level 3	Charcoal	550	20	1404–1443	Unpublished
16	UGAMS	44091	Rinconada de San Fernando	Burial	Human tooth	520	30	1407–1455	Garrido and Morales 2020
17	UGAMS	36051	Iglesia Colorada	Fundo Bauza	Human bone	530	20	1410–1450	Garrido and Morales 2020
18	UGAMS	36067	Iglesia Colorada	Burial 8, individual 2	Human tooth	530	20	1410–1450	Garrido and Morales 2019
19	UGAMS	36070	Iglesia Colorada	Burial 11, individual 2	Human tooth	500	25	1415–1460	Garrido and Morales 2019
20	UGAMS	48889	Punta Brava	Unit 5, level 1	Charcoal	520	20	1416–1452	Unpublished
21	UGAMS	36075	Iglesia Colorada	Burial 17	Human tooth	490	25	1417–1481	Garrido and Morales 2019; Garrido and others 2022

(*Continued*)

Table 1. List of Late Horizon Radiocarbon Dates from the Copiapo and Huasco Valleys. (*Continued*)

N	Lab	Number	Site	Context	Material	Date BP	Error	SHCal20 95.4%	Reference
22	UGAMS	48876	Punta Brava	Recinto 19, Unit C, level 1	Animal bone	510	20	1418–1455	Unpublished
23	UGAMS	44103	Iglesia Colorada	Unit 4, level 8	Animal bone	500	20	1424–1457	Unpublished
24	UGAMS	36036	Punta Brava	Summit	Human bone	480	20	1427–1481	Garrido and Morales 2020
25	UGAMS	36050	Iglesia Colorada	Fundo Bauzá	Human bone	460	20	1440–1611	Unpublished
26	UGAMS	36066	Iglesia Colorada	Burial 7	Human tooth	460	20	1440–1611	Garrido and Morales 2019
27	UGAMS	48871	La Puerta A	Palacete, Collca 2	Animal bone	460	20	1440–1611	Unpublished
28	AA	104027	Chinchilla 1	Unit 3, level 1	Charcoal	431	36	1441–1626	Garrido 2016
29	UGAMS	44097	Iglesia Colorada	Unit 1, level 15	Wood	450	20	1445–1613	Unpublished
30	UGAMS	36062	Iglesia Colorada	Burial 19, individual 1	Human tooth	450	20	1445–1613	Garrido and Morales 2019; Garrido and others 2022
31	UGAMS	44108	Viña del Cerro	Unit 7 level 4	Charcoal	450	20	1445–1613	Garrido and Plaza 2020
32	UGAMS	36063	Iglesia Colorada	Burial 19, individual 2	Human tooth	420	20	1451–1621	Garrido and Morales 2019; Garrido and others 2022
33	UGAMS	48891	La Puerta A	Unit 1, level 5	Charcoal	400	20	1451–1621	Unpublished
34	UGAMS	44092	Potrero El Chacay	Burial	Human bone	420	20	1451–1621	Unpublished
35	UGAMS	48874	Punta Brava	Platform 13A	Animal bone	420	20	1451–1621	Unpublished
36	UGAMS	48880	El Castaño	Unit 4I, level 40–50	Animal bone	410	20	1453–1623	Unpublished
37	UGAMS	44093	Potrero El Chacay	Burial	Human bone	410	20	1453–1623	Unpublished
38	UGAMS	44106	Iglesia Colorada	Unit 8, level 4	Charcoal	410	20	1454–1623	Unpublished
39	UGAMS	48873	La Puerta A	Collca 3	Wood	410	20	1454–1623	Unpublished
40	UGAMS	44105	Iglesia Colorada	Unit 7, level 3	Animal bone	400	25	1455–1627	Unpublished
41	UGAMS	36064	Iglesia Colorada	Burial 19, individual 3	Human tooth	390	20	1458–1627	Garrido and Morales 2019; Garrido and others 2022
42	UGAMS	48897	La Puerta A	Unit 4, level 2	Charcoal	390	20	1458–1627	Unpublished
43	UGAMS	44089	Viña del Cerro	Trench 9	Fish bone	900	25	1458–1710	Garrido and Plaza 2020

(*Continued*)

Table 1. List of Late Horizon Radiocarbon Dates from the Copiapo and Huasco Valleys. (*Continued*)

N	Lab	Number	Site	Context	Material	Date BP	Error	SHCal20 95.4%	Reference
44	UGAMS	44100	Iglesia Colorada	Unit 3, level 4	Animal bone	380	20	1463–1628	Unpublished
45	UGAMS	48867	La Puerta A	Room 15, level 50–60	Animal bone	380	20	1463–1628	Unpublished
46	UGAMS	44096	Iglesia Colorada	Unit 1, level 7	Charcoal	360	20	1497–1640	Unpublished
47	UGAMS	48886	Caldera	Tumi knife handle	Textile fiber	340	20	1497–1653	Unpublished
48	UGAMS	48898	La Puerta A	Unit 4 level 7	Charcoal	370	20	1502–1643	Unpublished
49	UGAMS	48868	La Puerta A	Room 14	Animal bone	350	20	1502–1643	Unpublished
50	UGAMS	36039	Copiapo downtown	Burial	Human bone	350	20	1502–1643	Garrido and Morales 2020
51	UGAMS	44102	Iglesia Colorada	Unit 4, level 2	Animal bone	320	20	1508–1654	Unpublished
52	UGAMS	48894	La Puerta A	Unit 3 level 2	Charcoal	300	20	1508–1654	Unpublished

well as materials obtained during archaeological excavations that I conducted between 2018 and 2019. I also included previously published radiocarbon dates for the Qhapaq Ñan—the Inca Road—and for nearby mining sites in the region (Garrido 2016) and Huasco Valley sites (Stehberg 1995). These dates were recalibrated using the OxCal software and the 2020 curve for the southern hemisphere (Hogg et al. 2020). In total, the dataset comprises 52 radiocarbon dates related to the Late Horizon, alongside other pre-Inca dates used in the figures to illustrate earlier occupations at specific sites (Figure 2).

First Stage: The Primacy of Logistics and Ritual Symbolism

According to the radiocarbon results, some of the earlier dates associated with Inca material culture and architecture in Copiapo are linked to two places (Figure 3): (1) the north–south branch of the Qhapaq Ñan in the Atacama Desert and (2) the mountain shrines, Copiapo Volcano and Jotabeche Volcano, both located in the Andes Mountains near the border with Argentina. The north–south branch of the Qhapaq Ñan crosses the Atacama Desert, enters the middle course of Copiapo Valley, and includes a series of lodging posts or tambos, spaced approximately 25–30 km apart (Garrido 2016; Hyslop 1984). This main Qhapaq Ñan route connected most of the current Chilean territory with Peru, even though it traversed areas with limited water and resources. There might have been another east–west branch of the Qhapaq Ñan along Copiapo Valley that connected the territory with northwestern Argentina, but there are no remaining traces of that road in the valley bottom. However, the narrowness and linearity of the valley facilitated easy transit from site to site, even without a formal road in the area.

The Tambo Medanoso site, located next to the north–south Qhapaq Ñan route about 40 km north of Copiapo Valley, consists of three compounds with a square layout covering approximately 3,000 m^2 (Garrido 2016). Two radiocarbon dates obtained from the excavation of its main architectural features suggest an early Inca presence in the territory (AD 1276–1392 and AD 1324–1453, SHCal20 95.4%). These dates may indicate the initial efforts to establish terrestrial communication links with the rest of the empire before the actual settlement and political consolidation of the region. Although the Qhapaq Ñan reaches the middle course of the Copiapo Valley, most of the physical Inca occupation developed later in the upper part of the valley.

The mountain shrines Copiapo Volcano and Jotabeche Volcano, which have artificial stone-walled platforms near their summits, are also associated with early Inca activity. Excavations conducted by Johan Reinhard and Miguel Cervellino in 1988 revealed evidence of burned wooden and textile offerings at both sites (Reinhard 1991). At Copiapo Volcano, a female Inca silver figurine dressed in clothes was found alongside two *Spondylus* figurines representing a person and a llama. Although neither of these places had evidence of human remains suggesting the ritual burial of children related to the capacocha ritual, the platforms and offerings bear striking similarities. Charcoal samples were taken from fire pits in Reinhard's excavation, yielding dates of 620 ± 20 BP (AD 1320–1413, SHCal20 95.4%) for Jotabeche Volcano and 650 ± 20 BP for Copiapo Volcano (AD 1305–1401, SHCal20 95.4%). Additionally, Copiapo Volcano produced an earlier date from the Late Intermediate period, suggesting it had local significance before the Inca arrival. Hans Niemeyer and his team identified various Inca sites within the high-altitude valleys of the region, including Los Helados, Tambo del Rio Nevado, Tamberia La Ollita, and Caserones (Castillo 1998). It is important to note that all these sites are situated in areas unsuitable for permanent settlement. They may have served as logistical support not only for the Andean crossing into Argentina but also for ceremonies associated with the mountain shrines. South of Jotabeche Volcano, stone structures, possibly of Inca origin, are also present at the summit of El Potro Mountain (Moyano 2009). However, no diagnostic material culture has been recovered from the site, and radiocarbon dates have not yet been obtained.

These dates from the mountain shrines and the Inca Road indicate that the Inca presence in the region began in the late fourteenth and early fifteenth centuries. This aligns with previous studies placing the start of Inca expansion in northern Chile around the same time range (Cornejo 2014), as well as earlier dates from Mendoza (Marsh et al. 2017) and the Jujuy region, both in Argentina (García et al. 2021). The initial establishment of ritual infrastructure, represented by the mountain shrines,

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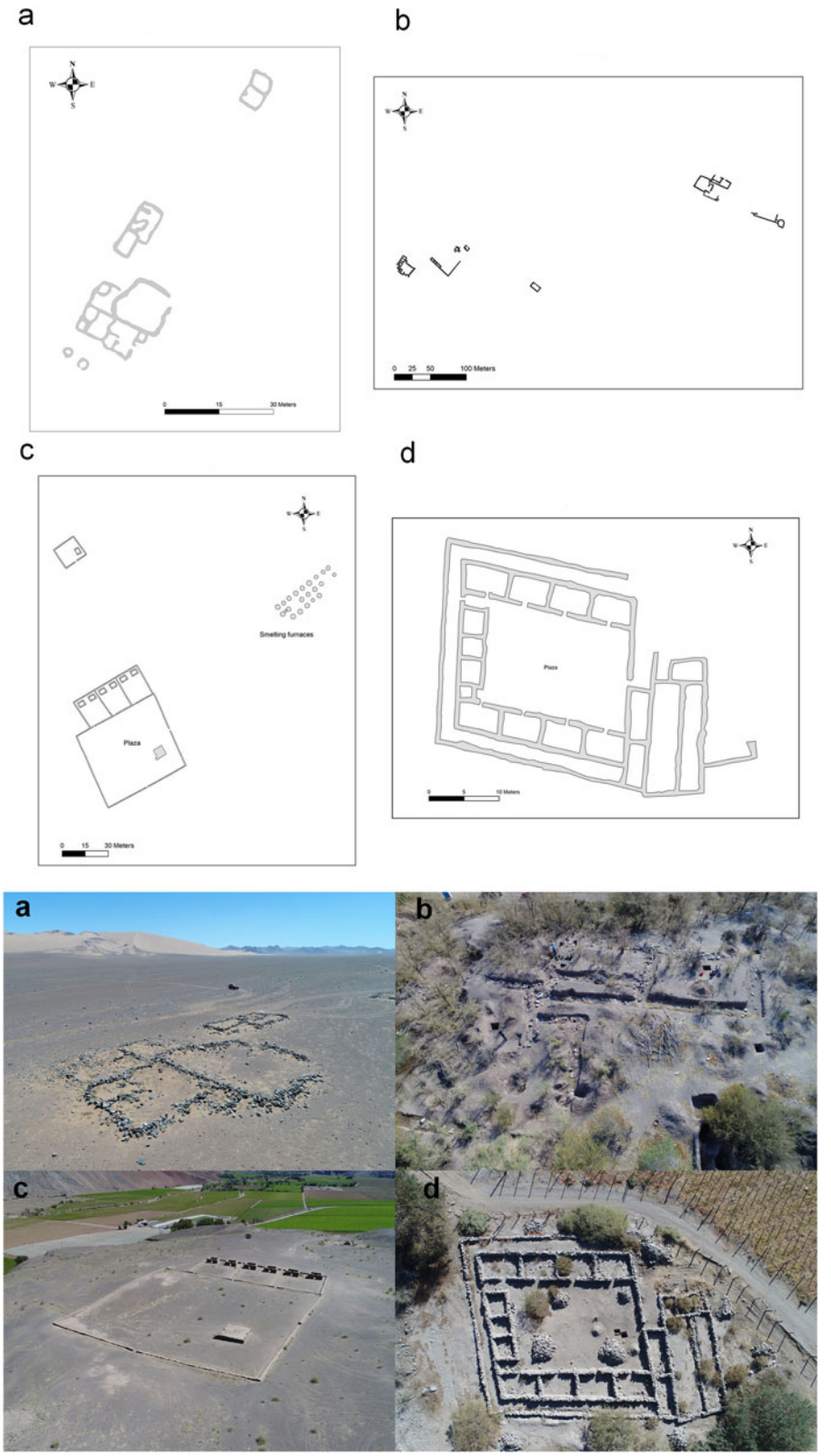

Figure 2. View of some of the Inca-style sites described in the article: (a) Tambo Medanoso, (b) Iglesia Colorada, (c) Viña del Cerro, and (d) La Puerta.

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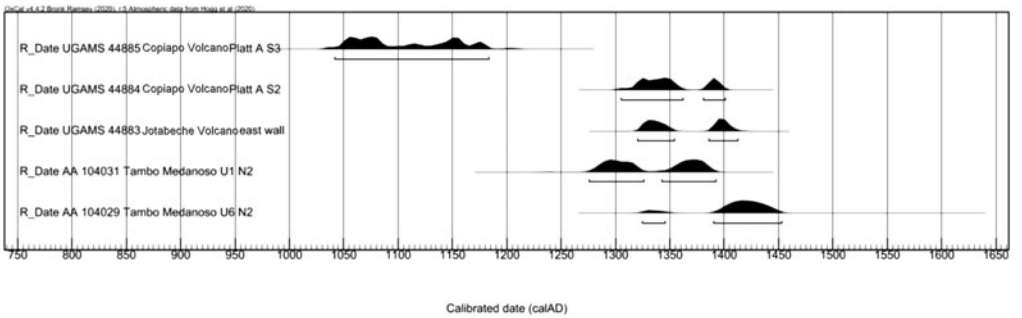

Figure 3. Calibrated radiocarbon dates from Copiapo Volcano, Jotabeche Volcano, and Tambo Medanoso.

and logistical infrastructure, exemplified by the Qhapaq Ñan and its tambos, formed the physical and ideological basis for imperial expansion, preceding actual political and economic intervention in local communities. This situation partly supports Acuto's (2022) argument that one of the Incas' main motivations for expansion was to capture and transform local sacred places, or *wak'as*: they sought to be recognized as supernatural entities capable of reorganizing the landscape and mediating between nonhuman agents and the local people. However, I propose that this interaction with nonhuman entities through the imposition of state cults likely represents only the initial phase of a process that continued to involve more direct intervention in the lives of the local population. This does not contradict the argument that the Inca planning and construction of the high-altitude shrines and its related infrastructure of paths and lodging required a significant degree of local interaction, negotiation, and knowledge (Reinhard and Ceruti 2010; Vitry 2020). However, it appears that this process may have occurred more rapidly than originally anticipated.

Second Stage: Intervention in Local Villages

During this stage, there was active intervention in local settlements. The Late Horizon archaeological sequence continued with the Inca occupation of the upper part of the Copiapo and Huasco Rivers, specifically at the Iglesia Colorada (Figure 4) and Alto del Carmen (Figure 5) sites. At Iglesia Colorada, we find significant evidence of architectural intervention in a local village, characterized by the construction of an enclosed patio area and a series of double-layered mud and stone square buildings. These structures span an area of approximately 13 ha and include residential units, a funerary zone, and rectangular public buildings called *kallankas*.

The *kallankas* are particularly noteworthy because of the high occurrence of sherds representing Inca-style vessel forms such as *aryballos*, shallow plates, and the small jar with a horizontal handle known as *aysana* (Castillo 1998; Garrido and Morales 2019). These findings suggest the performance of communal activities, possibly aimed at integrating a select group of individuals from the local population into the inner circle of Inca politics. However, in the nearby contemporary burial area of the local population, situated in immediate proximity to the main Inca public buildings, there is a deliberate absence of Inca pottery morphologies such as *aryballos*, shallow plates, or *aysanas* in their burial offerings. Instead, the offerings are exclusively composed of Copiapo pottery styles, including also some Diaguita pots. Furthermore, the discovery of caches containing severed heads, a phenomenon unprecedented in the Copiapo region, among domestic waste and devoid of accompanying offerings but exhibiting evidence of perforations for public display, supports a scenario of political and social tension. These practices, foreign to the region, were introduced by the Incas to orchestrate symbolically violent spectacles aimed at instilling fear and ensuring compliance with imperial rule (Garrido and Morales 2019; Garrido et al. 2022).

This evidence of ritual violence and the desecration of specific individuals from the local population contrasts with the Inca's efforts in organizing ceremonies and commensal activities. It is possible that both situations, ideological violence and diplomacy, were two sides of the same coin. The direct approach of intervening in administrative infrastructure and remodeling an existing local village

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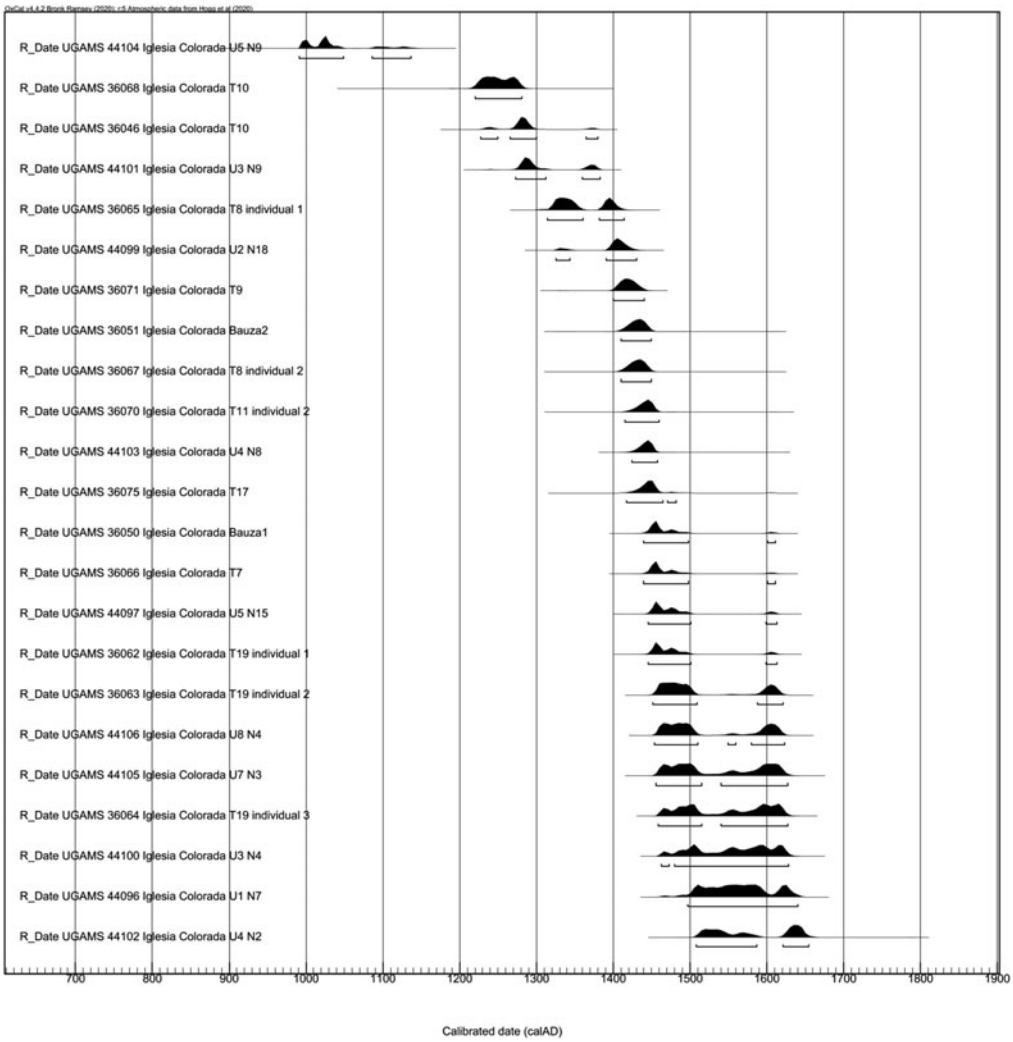

Figure 4. Calibrated radiocarbon dates from Iglesia Colorada from the Late Intermediate period to the Late Horizon. The year AD 1400 roughly marks the beginning of Inca-style material culture in the site.

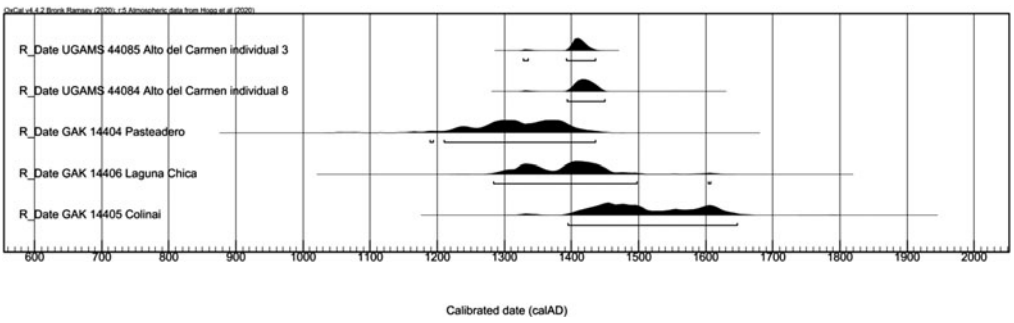

Figure 5. Calibrated radiocarbon dates from Late Horizon sites in the Huasco Valley. The last three were obtained by Rubén Stehberg (1995).

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may have facilitated control over the local labor force. However, at the same time this intervention might have created tensions that led to the use of more violent means of coercion. This lesson likely influenced strategic changes in the expansion to new territories, as further explored in the case of the La Puerta and Punta Brava sites.

Among the 16 radiocarbon dates from the Iglesia Colorada site associated with the Late Horizon, the earliest one is derived from burial 9, which contains Diaguita-Inca pottery bowls and dates to the period of AD 1400–1440, SHCal20 95.4%. These dating samples were obtained from the burials excavated by archaeologist Hans Niemeyer in the 1990s, as well as from my 2018 excavations in domestic areas.

The exclusion of Inca vessels in funerary contexts observed in Iglesia Colorada was not the norm. In fact, contemporary sites exhibit a different local approach to their symbolic integration with the Inca state. Huasco Valley, situated approximately 150 km south of Copiapo, is relatively understudied archaeologically. Although there have been documented findings of Inca burials throughout the valley, comprehensive archaeological excavations and surveys have only been conducted in the upper part. Alto del Carmen is one of the sites within the Huasco Valley that stands out as a Late Horizon cemetery, having undergone excavation twice, first in 1968 and then in 1988, under the guidance of Niemeyer (1971). Its significance is due to its contrast with Iglesia Colorada. In Alto del Carmen, local individuals were buried with both Diaguita and Inca pottery offerings, including locally crafted Inca vessel forms such as ornitomorphic shallow plates and *aryballos*. Unlike Iglesia Colorada, these communities embraced this new material culture, using it as part of their local symbolism for the afterlife, thereby indicating a stronger connection with the Inca Empire.

The two radiocarbon dates from Alto del Carmen, obtained from burial 3 and burial 8, fall within the periods of AD 1328–1445 and AD 1393–1449, respectively (SHCal20 95.4%). These dates correspond to the early association of local groups with Inca prestige goods. They align with previously published dates from sites such as Pasteadero, Laguna Chica, and Colinai (Figure 5), which are in the upper course of the Huasco Valley (Stehberg 1995), although the error range for these dates is slightly higher.

Third Stage: A Softer Approach

In this third stage, a more accommodating approach was adopted. In terms of chronology, the subsequent Inca-occupied site is La Puerta (Figure 6), situated in the middle course of the Copiapo River. This location, positioned at the narrowest segment of the valley, potentially offered logistical advantages by facilitating control over the movement of people and goods. Prior to the Inca presence, this stretch of the valley saw intensive occupation between AD 1000 and 1200, evidenced by numerous collective mound burials that created a monumental landscape. This earlier period was characterized by the use of prestige goods for social differentiation, an increase in labor-related pathologies, greater local mobility as indicated by isotopic studies, and extensive cultural connections with northwestern Argentina (Garrido and Morales 2020, 2022; Niemeyer 1994, 1998).

During the Late Horizon, the Incas built a complex structure at La Puerta, comprising a series of square stone-walled rooms with access to an internal patio. Three of these rooms lack doors and have been interpreted as food storage deposits, or "collcas" (Castillo 1998). The constructed area spans approximately 1,500 m^2, with no other Inca buildings in the vicinity. It is plausible that this site operated as an isolated administrative center focused on controlling and engaging in political negotiations with the local inhabitants. The proximity of the Inca structure to the preexisting burial mounds may also reflect a symbolic strategy of asserting state presence over the sacred landscape that was associated with the local ancestors.

Among the 10 radiocarbon dates that represent the Inca occupation at La Puerta, the earliest falls within the range of AD 1440–1611 (SHCal20 95.4%), indicating a later occupation than of Iglesia Colorada. Recent excavations conducted in 2019 revealed evidence of at least two construction stages at the site; the two stages were deduced from the discovery of a buried stone wall foundation that traversed the plaza in a north–south direction, aligning with one of the square rooms' corners. It is likely that the initial Inca construction did not include the enclosed plaza, with this feature added later to the

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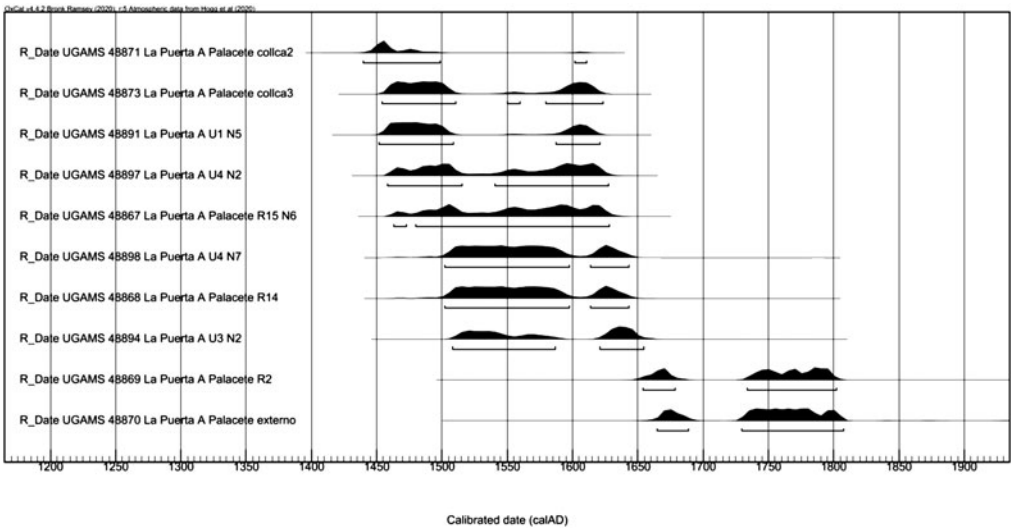

Figure 6. Late Horizon calibrated radiocarbon dates from La Puerta A.

site. Furthermore, the analysis of pottery styles reveals that, excluding monochrome sherds from utilitarian vessels, nearly one-third of the decorated sherds correspond to local Inca types (such as shallow plates and *aryballos*), underscoring the significance of this space for state ceremonial activities. This construction and remodeling of an Inca site resemble the case of Potrero de Payogasta in northwestern Argentina (D'Altroy et al. 2007), where there is also evidence of superimposed architecture, and its occupation began during the first half of the fifteenth century.

Commensal politics and diplomacy may have played vital roles in negotiating and securing the involvement of the local population in meeting Inca labor demands. This scenario suggests that the construction of the plaza might have been a response to a shift in strategy, indicating the need to engage with the local people in a more diplomatic manner. In contrast to Iglesia Colorada, La Puerta stands as an isolated building that potentially aligns with the concept of a "disembedded center" (Alconini 2008): it does not directly intervene in a local settlement nor appears to have generated significant socioeconomic transformations in its immediate vicinity.

The primary Inca economic intervention in the Copiapo Valley took place approximately 13 km upstream from La Puerta. This is where the copper-smelting facility of Viña del Cerro is situated at a former local site repurposed for imperial use. The Inca remodeling of Viña del Cerro involved the construction of 26 wind-driven furnaces, an enclosed plaza, rectangular houses for administrators and artisans, and a potential ceremonial platform. These structures were distributed across an area of around 5.5 ha (Castillo 1998; Niemeyer 1986). Through new excavations, the examination of metal slags, and the first radiocarbon dating for this site (Garrido and Plaza 2020), it was determined that Viña del Cerro had served as a smelting center since at least the Late Intermediate period.

Regarding its metal production, the slags were found only close to the furnaces, and there are no fragments of molds or crucibles indicating the manufacturing of finished artifacts. The compositional analysis of the slags revealed no presence of alloys such as tin bronze; this indicated that the primary product was pure copper ingots to be further processed elsewhere in the empire, possibly in metallurgical workshops located in northwestern Argentina, such as Los Amarillos, Potrero de Payogasta, and Rincon Chico 15 (Garrido and Plaza 2020). Another noteworthy aspect of the site is the relatively scarce material culture associated with its Inca occupation: only 2.8% of sherds were of foreign style, compared to other mining sites in northern Chile and sites like Iglesia Colorada and La Puerta in the Copiapo Valley that exhibit proportions of Inca sherds ranging from 12% to 40% (Berenguer and Cáceres 2008; Garrido and Salazar 2017; Niemeyer 1986; Uribe and Cabello 2005; Uribe and Urbina 2009; Uribe et al. 2007). Notably, even the plaza does not display significant

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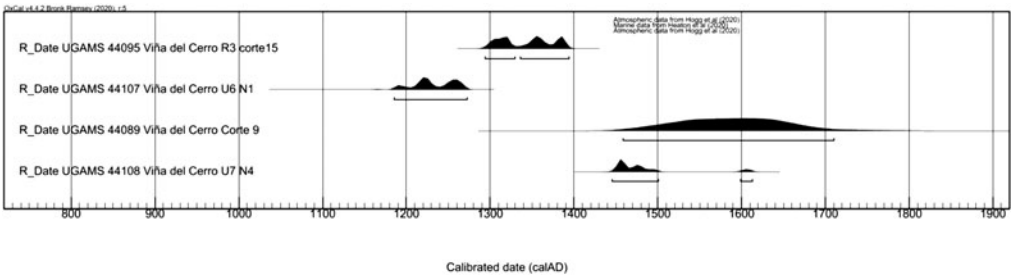

Figure 7. Late Horizon calibrated radiocarbon dates from Viña del Cerro from the Late Intermediate period to the Late Horizon.

evidence of Inca-style sherds associated with *aryballos* or shallow plates that could suggest the occurrence of state rituals and commensal activities.

It is possible that despite its size, Viña del Cerro did not experience intense occupation either because it was only recently used by the Incas before the collapse of the empire or because there was insufficient control over the local labor force to contribute to the mining *mit'a*. Among the five radiocarbon dates obtained from Viña del Cerro (Figure 7), the earliest falls within the range of AD 1445–1613 (SHCal20 95.4%) and corresponds to the same period as the site of La Puerta. Both sites reflect the second stage of Inca expansion into the middle course of the valley, the most densely populated area.

During the same period when state presence was concentrated at Viña del Cerro and La Puerta, other local villages did not come under direct imperial control. Merely 5 km downstream from the Inca center of La Puerta, Punta Brava is a small local village, consisting of multiple co-residential domestic structures located near agricultural fields that remained virtually untouched during the Inca intervention. This is in stark contrast to the previously described case of Iglesia Colorada, where there was direct intervention in terms of architectural patterns, the presence of Inca administrative buildings, and the performance of state rituals and commensal activities.

Punta Brava village is situated at the base of a small hill that may have served as a temporary defensive post. There are three layers of walls before reaching the hilltop, which possibly indicate a certain level of local conflict and political competition among the communities in the valley (Garrido and González 2020). Despite the presence of a small rectangular structure within an elliptical patio in the village, the site lacks evidence of double-faced stone masonry buildings, square plazas, or other Inca architectural features. The local architecture in the Copiapo Valley is characterized by clusters of circular or elliptical stone structures, which remained relatively unchanged from the Formative period to the Late Intermediate period. During the Late Horizon, places like Punta Brava likely continued their economic, political, and social life with minimal interference from the Inca state in their daily affairs. However, it is unknown whether the inhabitants were required to contribute labor tax to the state elsewhere. The small proportion of Inca and Diaguita pottery found at the site (less than 1%) likely indicates the acquisition of special items by the locals during political negotiations with the empire but not for everyday use. Among the six radiocarbon dates obtained from Punta Brava (Figure 8), the earliest one corresponding to a small residential platform ranges from AD 1155 to 1267 (SHCal20 95.4%). The other five dates range from the fifteen to sixteen centuries, encompassing the entirety of the Late Horizon.

It is likely that the people of Punta Brava were the ones who interacted with the Inca administrators in La Puerta because of their proximity. The construction and use of the internal patio in La Puerta may have been a response to the need for a different approach in dealing with the locals, unlike the previous direct occupation observed at Iglesia Colorada that seemed to have caused social tensions (Garrido and Morales 2019). In Punta Brava, the Incas decided to maintain a distance between the local people and the Inca administrative settlement, allowing them to remain in their own village. This change in the Inca expansion strategy suggests that the new advancements into the territory were more challenging and less likely to succeed using a direct intervention model.

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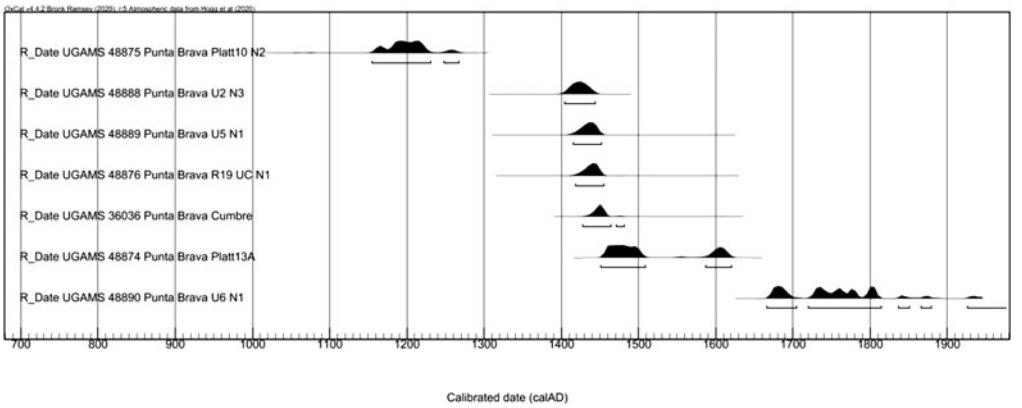

Figure 8. Late Horizon calibrated radiocarbon dates from Punta Brava from the Late Intermediate period to the Late Horizon.

Discussion

Concerning the mechanisms of imperial integration, available data suggest that following the Incas' connection of the Copiapo Valley with the Qhapaq Ñan and the establishment of their mountain shrines, they intensified their efforts of direct intervention in the daily lives of the local population in the upper part of the valley. This increased intervention is exemplified by the Iglesia Colorada site. However, it is important to note that this direct intervention was not without conflict, and it may have resulted in ideological expressions of violence, as evidenced by the display and disposal of local individuals' severed heads (Garrido and Morales 2019).

The occupation and construction of the La Puerta and Viña del Cerro sites mark a new phase in the expansion of Inca rule in the region. However, this expansion did not necessarily entail a greater level of intervention within the local communities. It is possible that La Puerta served as an administrative center for managing the territory and engaging in political negotiations with the locals, albeit on a smaller scale than at Iglesia Colorada. The addition of a plaza to the site indicates a growing need for establishing diplomatic relations through commensality following its initial construction and occupation. This suggests that local groups may have resisted immediate subordination and integration into Inca symbolism and labor requirements.

As a result, nearby places such as the local Punta Brava village did not undergo significant architectural modifications nor experience a major increase in the adoption of Inca material culture. This situation implies that, when the Incas extended their presence to the middle course of the Copiapo Valley, they learned from past experiences and attempted to avoid direct intervention in local villages. This shift exemplifies how the agency of the Copiapo people may have influenced new outcomes and dissuaded direct forms of imperial intervention. Assessing this aspect in other regions of the Inca Empire is crucial for understanding the prevalence of this strategy.

Viña del Cerro is particularly intriguing because it showcases the deployment of a significant productive infrastructure despite a relatively low level of occupation. This is evident through the scarcity of material culture associated with the Late Horizon period, in contrast with other mining sites in northern Chile and even other Inca sites like Iglesia Colorada and La Puerta (Garrido and Plaza 2020). Recent studies examining the isotopic evidence of individuals buried in the Copiapo Valley indicate reduced mobility during the Late Horizon and a lack of evidence for the influx of large numbers of foreigners. This suggests that economic institutions such as *mitmaqkunas*, which involve the resettlement of external workers, were likely not established in this region (Garrido and Morales 2020).

Relying on the local population to engage in labor-intensive tasks such as copper mining, ore transportation, and smelting within an isolated territory characterized by decentralized polities, a low hierarchy, and a sparse population could have generated tensions that complicated political negotiations between the state and local leaders. Furthermore, the region's isolation and distance from the

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Central Andes, coupled with the potential involvement of other groups like the Diaguita, who may have played a role in local management but also hindered the full utilization of Inca state institutions in the territory, may have contributed to limiting the effective control exerted by the Inca state over the region.

Inca logistic infrastructure, such as the Qhapaq Ñan in the Atacama Desert, not only served imperial interests but was also partially adopted by local people for their own economic benefit (Garrido 2016). In addition to official infrastructure like tambos, which provided accommodation for travelers and enhanced route control, the road system facilitated the establishment of multiple local sites that aided in the movement and exchange of locally crafted mining products. The intensification of malachite-turquoise bead and iron oxide red pigment production was made possible by the Inca Road's logistical improvements and the resulting increase in desert traffic, without the imposition of the *mit'a* system for labor mobilization seen in other physically intervened mining sites in northern Chile (Garrido and Salazar 2017).

As demonstrated by the previous examples, the imperial integration of the Copiapo region was far from uniform. Although some local communities underwent significant transformations to fulfill state labor requirements, others likely maintained their previous way of life with minimal disruption, and certain groups even benefited from the presence of Inca state infrastructure. The key is to recognize the contingencies of the Inca state's infrastructural power as a nonlinear process, influenced by the adaptive potential of imperial strategies, local agency, and processes of negotiation between authorities and locals during the establishment of a new empire.

Conclusion

Due to a significant number of new radiocarbon dates from the Late Horizon period, it is now possible to study the process of Inca expansion in the Copiapo Valley and observe the sequence of mechanisms that contributed to building their empire. Understanding the consolidation of the state in the Inca heartland as a gradual and regionally diverse process of the centralization of authority (Bauer 1992, 2004; Bauer and Covey 2002; Covey 2006) is crucial, and this perspective should also be applied to the provinces.

It is widely known that the Incas used various strategies to maintain control over their conquered territories. These strategies included resettlement, kinship alliances, militarism, intervention in local economies, commensal politics, ideological propaganda, and the establishment of ritual spaces (Acuto 2022; Bauer 2004; Bauer and Covey 2002; Covey 2006; D'Altroy 2015; D'Altroy et al. 2007; Julien 2004, 2012; Morris 1998; Ogburn 2004; Stanish 2001). Implementing and enforcing these strategies required not only the development of imperial infrastructure to extend the influence of state policies but also the collaboration of local leaders in a process that was not without conflict and negotiation. Because the Inca mechanisms that aimed to promote social differentiation through social prestige in subjugated populations did not consistently translate to tangible improvements in their material living conditions (Hu and Quave 2020), gaining compliance from groups situated on the periphery of the empire might have been challenging, especially if it affected previous standards of living.

In an isolated and distant region like the Copiapo Valley, situated at the southern end of the Atacama Desert, the construction of the Qhapaq Ñan road and the establishment of high-altitude mountain shrines in the Andes can be seen as the initial steps taken by the Incas to consolidate logistical connectivity and assert their ritual dominance over the area. This initial physical presence in the territory laid the foundation for subsequent political and economic interventions into local communities, with effective social control developing gradually after the establishment of state infrastructure (cf. Soifer and Vom Hau 2008). The site of Iglesia Colorada represents a second stage of expansion characterized by a more pronounced intervention in the lives of local communities. However, this approach resulted in social tensions, possibly leading to a decision to adopt a softer, more indirect, and diplomatic approach toward the locals. The third stage is exemplified by the sites of Viña del Cerro, La Puerta, and Punta Brava, where Inca occupation began approximately 40–50 years after Iglesia Colorada. This three-stage model is contingent on the specific local history of the Copiapo

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Valley. In other places, different factors might alter this sequence. Depending on the degree of assimilation and cooperation with the Incas, the effects of diplomacy and intervention mechanisms could have manifested in various ways, leading to changes in the methods of imperial expansion.

Despite the relatively low level of Inca infrastructure investment in Copiapo, its geopolitical significance as a gateway to the southern territories beyond the Atacama Desert likely necessitated the maintenance of political control over the region. In general, "Infrastructure unites distant strangers into new communities" (Guldi 2012:198) and serves as a tangible manifestation of state power. The Inca expansion fostered the development of provincial communities characterized by asymmetrical power relations that, in turn, could have amplified local processes of social complexity and the pursuit of private political and economic agendas. By highlighting this dual nature of infrastructural power, this article demonstrates that the spatial extent of the Inca Empire could not have been achieved without considering strategic changes over time, which may have been influenced, at least in part, by local actors who were well positioned to express their agency.

In summary, this article illuminates the "infrastructural" factors that contextualized Inca expansion in the Collasuyu region, using the example of the Copiapo Valley. It not only explains the various expressions of Inca rule across the territory but also provides a temporal framework to understand these differences as a process of change and contingency shaped by both Inca administrators and local populations. This approach adds a new dimension to the continuum between hegemonic and territorial Inca expansion strategies (Alconini 2008; D'Altroy 2015), where the success or failure of one strategy could influence the use of another. Similar to the critique of the concept of "Romanization" for its inability to capture the diversity and outcomes of cultural change in the Roman period (Gardner 2013:2), the significance of the debate surrounding imperial expansion lies in understanding how imperial material culture and infrastructure operated dynamically throughout the empire and served the purposes of multiple agents with diverse intentions in new territories and networks (Versluys 2014).

Further research is necessary to explore the specific actions of local populations during the Inca expansion in the region and their interactions with Inca administrators and the newly established state infrastructure. Additionally, it is crucial to compare the local scenario with neighboring territories and other Inca provinces. I hope that this initial approach sheds light on the strategies and challenges of Inca imperialism in a way that seriously considers the role that local people may have played in shaping its outcomes.

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