

The Latin American Studies Book Series

Agustina Scaro
Clarisa Otero
Maria Beatriz Cremonte
Editors

Pre-Inca and Inca Pottery

Quebrada de Humahuaca, Argentina

 Springer

The Latin American Studies Book Series

Series editors

Eustógio Wanderley Correia Dantas, Fortaleza, Brazil

Jorge Rabassa, Ushuaia, Argentina

Andrew Sluyter, Baton Rouge, USA

The Latin American Studies Book Series promotes quality scientific research focusing on Latin American countries. The series accepts disciplinary and interdisciplinary titles related to geographical, environmental, cultural, economic, political and urban research dedicated to Latin America. The series publishes comprehensive monographs, edited volumes and textbooks refereed by a region or country expert specialized in Latin American studies.

The series aims to raise the profile of Latin American studies, showcasing important works developed focusing on the region. It is aimed at researchers, students, and everyone interested in Latin American topics.

More information about this series at <http://www.springer.com/series/15104>

Agustina Scaro · Clarisa Otero
Maria Beatriz Cremonte
Editors

Pre-Inca and Inca Pottery

Quebrada de Humahuaca, Argentina

Editors

Agustina Scaro
Centro Regional de Estudios Arqueológicos,
Facultad de Humanidades y Ciencias
Sociales
Universidad Nacional de Jujuy
San Salvador de Jujuy
Argentina

Maria Beatriz Cremonte
Instituto de Ecorregiones
Andinas-CONICET
Universidad Nacional de Jujuy
San Salvador de Jujuy
Argentina

Clarisa Otero
INECOA
Universidad Nacional de Jujuy, CONICET
San Salvador de Jujuy, Jujuy
Argentina

and

Instituto Interdisciplinario Tilcara, Facultad
de Filosofía y Letras
Universidad de Buenos Aires
Tilcara, Jujuy
Argentina

ISSN 2366-3421 ISSN 2366-343X (electronic)
The Latin American Studies Book Series
ISBN 978-3-319-50573-2 ISBN 978-3-319-50574-9 (eBook)
DOI 10.1007/978-3-319-50574-9

Library of Congress Control Number: 2016959964

© Springer International Publishing Switzerland 2017

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made.

Printed on acid-free paper

This Springer imprint is published by Springer Nature
The registered company is Springer International Publishing AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

Pottery production, as one of the most widespread productive activities in the past, allows us to approach different aspects of people's lives. Therefore, the analysis of archaeological settlement pottery provides information about human behavior and social practices linked to its production, distribution, and consumption, both in everyday and ritual activities.

In the province of Jujuy (the northernmost sector of Argentina) Quebrada de Humahuaca is one of the most widely recognized archaeological zones and one of the most widely studied. An important reason for this is undoubtedly the particular topography of the Quebrada, a semi-arid valley stretching between 1800 and 2800 masl (Fig. 1). This topography has facilitated its functioning as a natural corridor linking nearby desert-like, high-altitude regions in the west (*Puna*) to lower altitude, humid valleys located to the east (*Yungas*) in what is today the Province of Jujuy.

Similarly to what has been found for other Andean regions, permanent settlements occurred over time and those settlements were transformed into highly complex productive societies since the thirteenth century, corresponding to the Regional Developments Period (RDP; Late Intermediate Period in the Andes). During that period, the development of pottery styles reflected the materiality of the *Omaguaca* groups identity. During the fifteenth century Quebrada de Humahuaca was incorporated into the *Tawantinsuyu* (the Inca Empire). The Inca Empire extended over 5000 km in western South America, from Ecuador to Chile, incorporating different environments and ethnicities with varying levels of political complexity. A range of direct or indirect strategies of domination were performed in the provinces as revealed by Spanish chronicles and the study of archaeological records. Relations between the state and subject groups had to be tailored to the existing organizations, capabilities, and interests of both the central powers and the provinces, with different existing scales of control in productive activities, such as pottery production. On the other hand, within the frame of the state political and economic strategies, some foreign pottery styles may be partly attributable to the Inca practice of *mitmaqkuna*, the displacement and relocation of entire subject populations.

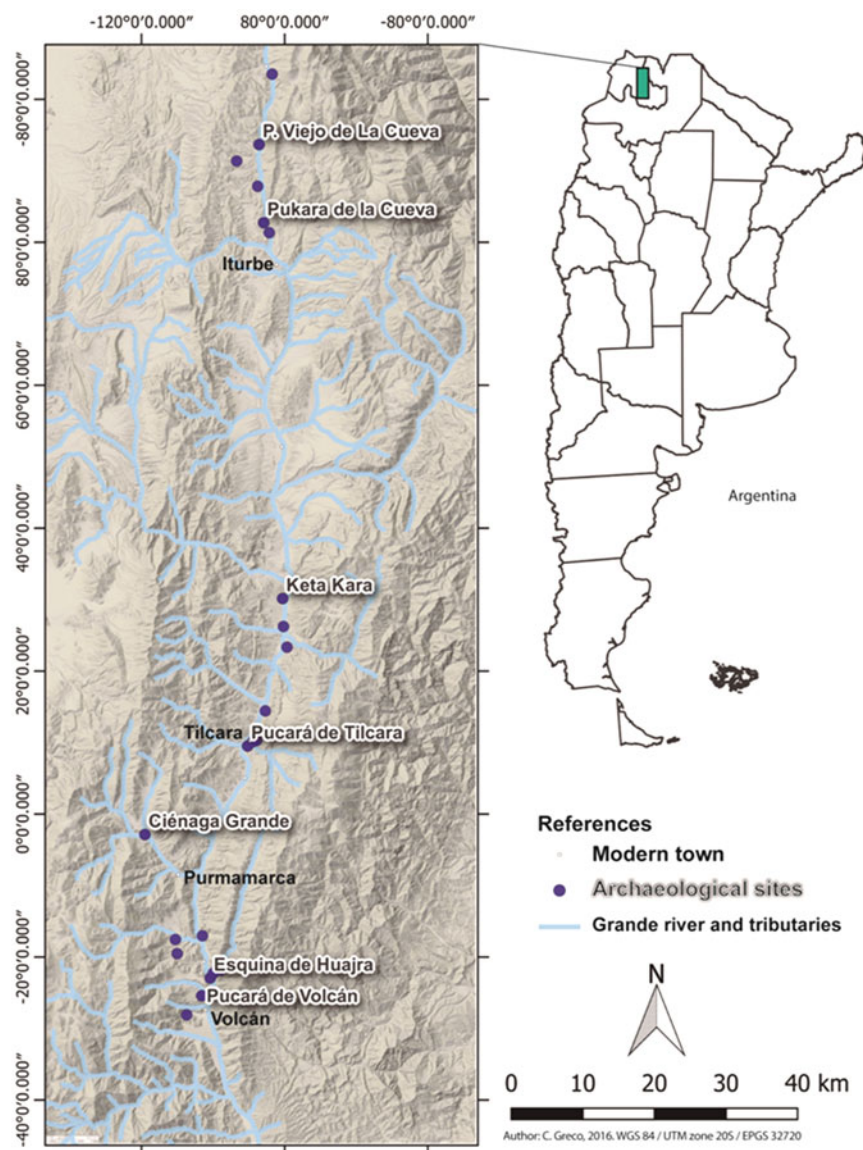


Fig. 1 Map of Quebrada de Humahuaca with the location of the sites mentioned in the text

The richness and abundance of ceramic material evidence in the landscape of the Quebrada awoke the interests of archaeologists very early on, promoting extensive excavations of the most conspicuous settlements. The results of these interventions have served not only to characterize these pre-Hispanic agricultural societies and

construct chronologies of northwestern Argentina, but also to elaborate models of trans-Andean population dynamics.

Since 2003 Quebrada de Humahuaca was made a UNESCO World Heritage Site. Numerous tracks, roads, and settlements testify its history from pre-ceramic to colonial times. Due to its strategic position, Quebrada de Humahuaca has been colonized by both the Inca and the Spaniards. It also has been a stage for many battles during the Argentine War of Independence.

A selection of articles that reflect part of the results obtained within the Project of the Agencia Nacional de Promoción Científica y Tecnológica (ANPCYT) PICT 01538 *Cerámicas arqueológicas de Jujuy (Quebrada de Humahuaca, yungas y valles templados). Prácticas sociales y arqueología aplicada* are included in this book. Through these articles, different perspectives for archaeological pottery studies are presented, regarding the understanding of pre-Hispanic social practices. Moreover, applied archaeology tasks carried out provided experiences linked to contemporary perceptions of local communities about archaeological cultural heritage. As study cases, pottery contexts of different archaeological settlements researched at Quebrada de Humahuaca in northern, central, and the central south sectors are analyzed. Also within the Appendix is included a selected ceramic sample from the site Esquina de Huajra. The aim of this book is to contribute to Quebrada de Humahuaca's archaeological knowledge and promote its inclusion in current discussions about Andean and worldwide past pottery production.

Lucas Pereyra Domingorena and María Beatriz Cremonte analyze the San Francisco pottery tradition, one of the most important and widely distributed Formative cultural expressions in northwestern Argentina. This chapter contributes to the characterization of this pottery tradition by reviewing the information and interpretations reached to date and providing new evidence from two sectors of northwestern Argentina: the San Francisco River Basin and the central south sector of Quebrada de Humahuaca (Jujuy Province). Pottery materials recovered from these areas were analyzed through the application of petrographic techniques and statistical analysis of the quantitative variables. The main goal was to answer two questions: Is the identity of San Francisco, reflected in the forms and iconography of their vessels, also expressed in their pastes as a distinct manufacturing tradition? Can technical and textural characteristics of the pastes set trends that reflect a local production of San Francisco vessels in the central south sector of Quebrada de Humahuaca? These studies corroborate the existence of the four groups of pastes previously defined and propose that vessels of the same ceramic type have different types of fabrics. The same type of fabrics are present both in the San Francisco Basin sites as well as in the central south sector of Quebrada de Humahuaca's sites, therefore we cannot state differences in the manufacturing patterns of these two areas. Nevertheless, a slight tendency towards pastes with a common presence of slate and phyllites was registered in the central south sector of Quebrada de Humahuaca's sites. Finally, the adding of grog, present in most of the San Francisco pastes, is undoubtedly the *hallmark* of this pottery tradition. This trait is shared by other cultural traditions from the eastern slopes of the Andes and it is also an idiosyncratic feature of the pottery assemblages of the Chaco area, establishing a

notable difference with other pottery traditions from the Formative Period of northwestern Argentina.

María Clara Rivolta, Clarisa Otero, and Catriel Greco propose to include new evidence, such as unpublished radiocarbon dating and the analysis of material context elements from sites located in the central sector of Quebrada de Humahuaca, considered in classical proposals as part of the Middle Period (600–900 AD). As a result of these studies radiocarbon datings were obtained, repositioning Isla manifestations in the interval between the twelfth and fourteenth centuries. This implies the proposal for interpretive schemes about the interrelation of small conglomerates such as La Isla de Tilcara with villages in domestic terraces, given that they were contemporaries according to this new evidence. In this sense, the strong contrast between landscape elements and materiality—mainly ceramics—leads to the formulation of hypotheses concerning the possibility that, after the fall of Tiwanaku and during later times, there was a shift of small groups coming from the Altiplano towards Quebrada de Humahuaca, a region that did not have a significant population density at that time.

Paola Ramundo presents the spatial distribution of pottery in Quebrada de La Cueva (Humahuaca, Jujuy, Argentina) as a useful hint to understand consumption relations. In this study, consumption is mainly viewed on a stylistic level, both at an intra- and inter-site scale in the area. Furthermore, the evaluation of this practice through time could contribute to the study of past social practices in the area. Considering this region as part of the northern Quebrada de Humahuaca, it is suggested that the place suffered similar change processes at different levels. The starting point is thus defined by the general hypothesis that consumption of pottery in Quebrada de La Cueva varied through time. From this, a number of minor hypotheses may be derived: (a) during the Late Formative Period, consumption of pottery in the area had a more foreign nature; and (b) during the Regional Developments Period II (RDPII) and Inca Periods, its consumption was more locally based than during previous and probably later occupational events. Hence, this chapter considers pottery at a stylistic level, using the concept of goods consumption being understood as a kind of symbolic action. In order to analyze the consumption of pottery on a style level, a number of analyses are performed: (1) decorative analysis of complete vessels and sherds recovered from past and recent excavations; (2) study of space and time variability in styles at inter- and intra-site scales in the area; and (3) preliminary outline of some of the ways pottery was consumed in Quebrada de La Cueva.

In order to contribute to the knowledge of the RDP of Quebrada de Humahuaca (Período de Desarrollos Regionales), Agustina Scaro and Lautaro López Geronazzo address the study of El Poblado's Enclosure 2 through pottery and zooarchaeological analyses. El Poblado was the only site exclusively occupied during that period in the central south section of Quebrada de Humahuaca. Thus, studying the materiality of this settlement provides an opportunity to understand social dynamic processes prior to Inca domination. The contextual analysis of Enclosure 2 allows recognizing diverse activities as well as understanding its role within settlement functionality. Based on these analyses, the authors consider that different activities

were carried out at Enclosure 2, such as the preparation of food, the storage of food and other goods, and resting. Considering the presence of a high concentration of zooarchaeological remains and fragmented pottery vessels in such a small enclosure (22 m²), and that of “special” elements, rarely recovered in other contexts in Quebrada de Humahuaca, such as a bird skull, a bone trumpet, a group of camelid phalanges, and a probable mollusc ornament, suggests a non-domestic space. It is stated that Enclosure 2 was linked to communal activities developed at the community participation space or “plaza” where it is located.

Clarisa Otero’s chapter aims to present a synthesis of the wide variety of stylistic manifestations registered in the ceramic assemblage of Pucara of Tilcara, established as the capital of a *wamani* on the previous settlement. The pottery of this site allows characterizing styles from other regions of the Andes that circulated during the last late pre-Hispanic period, as well as recognizing morphological and decorative transformations in ceramics manufactured locally. The author mainly focuses on changes resulting from the Inca conquest that led to consideration being given to the fact that the pottery of this region—defined for decades as abstract or geometric—was an important visual resource to express identity messages and to impose new narratives by the State. In this context Otero highlights the use of two rhetoric figures: metaphor and metonymy, also detected in other non-ceramic supports, reflecting the existence of religious beliefs related to the supernatural and to fertility cults.

Agustina Scaro discusses the Humahuaca-Inca site of Esquina de Huajra regarding the morphological and decorative protocols of its pottery, based on a stylistic perspective. This, in order to understand regularities in shape-decoration identified for each style present in the site repertory. However, the protocol also accounts for Esquina de Huajra’s morphological and decorative pottery variability. This variability, as well as the high incidence of foreign vessels, is significantly higher than that observed at the nearby and contemporary settlement of Pucara de Volcán. This situation suggests that Esquina de Huajra would have played a significant role within the new landscape created by the Inca administration, related to the status of its inhabitants and to their participation in interaction networks that extended well beyond northwestern Argentina.

Catriel Greco presents a compilation and review of radiocarbon dates from different archaeological sites in the central south of Quebrada de Humahuaca. These include those made by Beatriz Cremonte and her team in recent years, as well as those previously available for the region. After reviewing each radiocarbon dating and its context, conventional statistics and Bayesian modeling techniques are used to evaluate temporal trends. Temporal lapses determined by Greco allow adjusting pottery styles trajectories during pre-Inca and Inca times.

In their chapter, Mónica Montenegro, Elisa Aparicio, and Nicolás Lamberti share experiences developed in Quebrada de Humahuaca about the use of archaeological ceramic as a device for social memory. In the field of public archaeology the authors provide an extensive and thorough discussion about the role of archaeology in the construction of counter-hegemonic discourses about local past, and the necessity to ponder the pedagogic dimension in relation to the

transference of scientific knowledge in the paths of inter-cultural collaboration. This research, as a link between past and present, encourages the planning of new intervention strategies in contexts of tension and reflexivity where inter-ethnic and inter-cultural relationships are constantly being reconfigured.

Finally, Valeria López and Agustina Scaro made up an Appendix formed by the illustration and brief description of 14 fragmented vessels and 30 selected potsherds from Esquina de Huajra. Almost 7000 potsherds were excavated at this site, a settlement only occupied during Inca times in Tumbaya. As Humahuaca-Inca pottery and related types are little known in the region we decided to show the most conspicuous decorative and morphological attributes present in the ceramic contexts, which are described in the chapter written by Scaro in this book.

Every chapter published in this book was evaluated. We give thanks to those on the evaluation committee, formed by Fabiana Bugliani (IDECU-Universidad de Buenos Aires-CONICET-Museo Etnográfico), Javier Natri (CONICET-Universidad Maimónides), Gustavo Barrientos (CONICET-Universidad Nacional de La Plata), María Amalia Zaburlín (Universidad Nacional de Jujuy), María Clara Rivolta (Universidad Nacional de Salta-Universidad de Buenos Aires), Verónica Puente (CONICET-Universidad Nacional de Mar del Plata), and Paola Bolados (Universidad de Valparaíso). We also thank Catriel Greco for the elaboration of the maps used in this book.

San Salvador de Jujuy, Argentina

Agustina Scaro
Clarisa Otero
Maria Beatriz Cremonete

Contents

| | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| The Same Way of Doing Pottery. San Francisco Ceramic Fabrics from Tumbaya (Quebrada de Humahuaca) and San Pedro (San Francisco River Basin) | 1 |
| Lucas Pereyra Domingorena and María Beatriz Cremonte | |
| Reconsidering Isla Occupation. Pottery, Chronology, and Settlement | 29 |
| María Clara Rivolta, Clarisa Otero and Catriel Greco | |
| Consumption of Pottery in Quebrada de la Cueva, Humahuaca, Jujuy | 51 |
| Paola Silvia Ramundo | |
| Contextual Pottery and Faunal Analysis in the Pre-Inca Site of El Poblado | 81 |
| Agustina Scaro and Lautaro López Geronazzo | |
| Ceramic Styles from the Pucara de Tilcara Settlement During the Inca Domination | 107 |
| Clarisa Otero | |
| Esquina de Huajra Vessels. A Morphological and Decorative Study of Humahuaca-Inca Pottery. | 139 |
| Agustina Scaro | |
| Statistical Analysis of Radiocarbon Datings from the South Central Sector of Quebrada de Humahuaca | 169 |
| Catriel Greco | |
| Pre-hispanic Ceramics as Memory Instruments. Public Archaeology and Inter-cultural Collaboration in the Educative Communities of Quebrada de Humahuaca. | 189 |
| Mónica Montenegro, María Elisa Aparicio and Nicolás Lamberti | |
| Appendix: Esquina de Huajra Pottery Inventory | 209 |

Contributors

María Elisa Aparicio Universidad Católica de Santiago del Estero, DASS, San Salvador de Jujuy, Jujuy, Argentina

María Beatriz Cremonte INECHOA, Universidad Nacional de Jujuy, CONICET, San Salvador de Jujuy, Jujuy, Argentina

Lucas Pereyra Domingorena IDECU, Universidad de Buenos Aires, CONICET, Buenos Aires, Argentina

Lautaro López Geronazzo INECHOA, Universidad Nacional de Jujuy, CONICET, San Salvador de Jujuy, Jujuy, Argentina

Catriel Greco Departamento de Geología, Universidad Nacional de San Luis, CONICET, San Luis, Argentina

Nicolás Lamberti Centro Regional de Estudios Arqueológicos, Universidad Nacional de Jujuy, San Salvador de Jujuy, Jujuy, Argentina

Mónica Montenegro Instituto Interdisciplinario Tilcara, Facultad de Filosofía y Letras, Universidad de Buenos Aires, Tilcara, Jujuy, Argentina; Centro Regional de Estudios Arqueológicos, Universidad Nacional de Jujuy, San Salvador de Jujuy, Jujuy, Argentina

Clarisa Otero Instituto Interdisciplinario Tilcara, Facultad de Filosofía y Letras, Universidad de Buenos Aires, Tilcara, Jujuy, Argentina; INECHOA, Universidad Nacional de Jujuy, CONICET, San Salvador de Jujuy, Jujuy, Argentina

Paola Silvia Ramundo CONICET, Facultad de Ciencias Sociales, Departamento de Historia, Pontificia Universidad Católica Argentina, Buenos Aires, Argentina

María Clara Rivolta Facultad de Humanidades, Universidad Nacional de Salta, Salta, Argentina; Instituto Interdisciplinario Tilcara, Facultad de Filosofía y Letras, Universidad de Buenos Aires, Tilcara, Jujuy, Argentina

Agustina Scaro Centro Regional de Estudios Arqueológicos, Universidad Nacional de Jujuy, San Salvador de Jujuy, Jujuy, Argentina

Reconsidering Isla Occupation. Pottery, Chronology, and Settlement

María Clara Rivolta, Clarisa Otero and Catriel Greco

Abstract This chapter presents new evidence, such as unpublished radiocarbon dating and the analysis of material context elements from sites located in the central sector of Quebrada de Humahuaca, considered in classical proposals as part of the Middle Period (600–900 AD). As a result of these studies, radiocarbon datings were obtained, repositioning Isla manifestations in the interval between the 12th and 14th centuries. This allows the proposal of interpretive schemes about the interrelation of small conglomerates such as La Isla de Tilcara with villages in domestic terraces, given that they were contemporaries according to this new evidence. In this sense, the strong contrast between landscape elements and materiality—mainly ceramics—leads to the formulation of hypotheses concerning the possibility that, after the fall of Tiwanaku and during later times, began the arrival of small groups from the Altiplano towards Quebrada de Humahuaca, a region that did not have a significant population density at that time.

Keywords Isla ceramic · Altiplanic influence · Population dynamic

M.C. Rivolta (✉)
Facultad de Humanidades, Universidad Nacional de Salta,
Av. Bolivia 5450 (4400), Salta, Argentina
e-mail: rivoltaclara@gmail.com

M.C. Rivolta · C. Otero
Instituto Interdisciplinario Tilcara, Facultad de Filosofía y Letras,
Universidad de Buenos Aires, Belgrano 445 (4624), Tilcara, Jujuy, Argentina
e-mail: clarisaotero@yahoo.com.ar

C. Otero
INECOA, Universidad Nacional de Jujuy, CONICET,
Av. Bolivia 1661, (4600), San Salvador de Jujuy, Jujuy, Argentina

C. Greco
Departamento de Geología, Universidad Nacional de San Luis, CONICET (5700),
San Luis, Argentina
e-mail: catrielgreco@gmail.com

Since the beginning of investigations regarding archaeological pottery from Quebrada de Humahuaca, emphasis has been placed on the characterization of different styles used mainly for establishing typological sequences. Beyond the generated contributions in only a few cases has the cause been explained for substantial transformations between the styles from one period to another. This fact inspired us to advance on the analysis of Isla's stylistic assemblage and its repositioning in regional chronology taking new radiocarbon dates as a base. On the other hand, we sought to generate a hypothesis that allowed us to define the specific moments in which these styles developed in order to articulate the social dynamic between the XII and XIV centuries. With this idea in mind we analyze landscape conditions and features as well as the modifications appreciated in the settlements located in the middle sector of Quebrada de Humahuaca, with chronology obtained through Bayesian statistical analyses, and materiality, emphasizing local pottery assemblages. For the purpose of conducting an integrated study, the considered archaeological sites are: La Isla de Tilcara (Debenedetti 1910), Huacalera (Rivolta 2003b), Keta-Kara (Pelissero 1995), Puerta de Juella (Casanova 1937; Raffino 1991), Banda de Perchel (Rivolta 2003b), Puerta de Maidana (Schuel 1930; Aleksandrowicz 1987b; Rivolta 2003b), Alto de La Isla (Rivolta 2000, 2003b), El Manzano (Otero and Mercolli 2008; Otero and Rivolta 2015), and Hotel Las Marías (Otero and Rivolta 2015) (Fig. 1). In order to analyze the problem we will work with key issues such as landscape, materiality, and chronology, dissociating them but at the same time generating a discussion regarding the posed problem (The posed problem is the position of La Isla and its adscription to Middle Period in classical chronology) by the end of this chapter.

1 Regional Chronologies

Several chronological proposals regarding the development of complex societies in the Argentine northwest have been generated, among which we find that elaborated by Bennett et al. (1948). That investigation, based on collection analysis from different sites, outlined regionalized schemes which considered not only periods but also pottery styles. In that paper, Bennett mentions five periods: Early, Middle (in this case represented by Isla Polychrome and Alfarcito Polychrome styles), Late, Inca, and Colonial; dividing the Argentine northwest into sections or areas for their study.

It was not until the 1960s that archaeologists were able to establish more precise sequences thanks to radiocarbon dating (González 1963). Nevertheless, the Quebrada de Humahuaca chronology remained a controversial issue, considering the fact that original proposals were elaborated for the Hualfín Valley (González 1955). Subsequently, and after the revision and adequacy of the master sequence, having considered the now available radiocarbon dates, González and Pérez (1972) developed a wide-ranging scheme in which they defined the following intervals: Early (0–650 AD), Middle (650–850 AD), Late (850–1480 AD), Inca (1480–1536 AD),

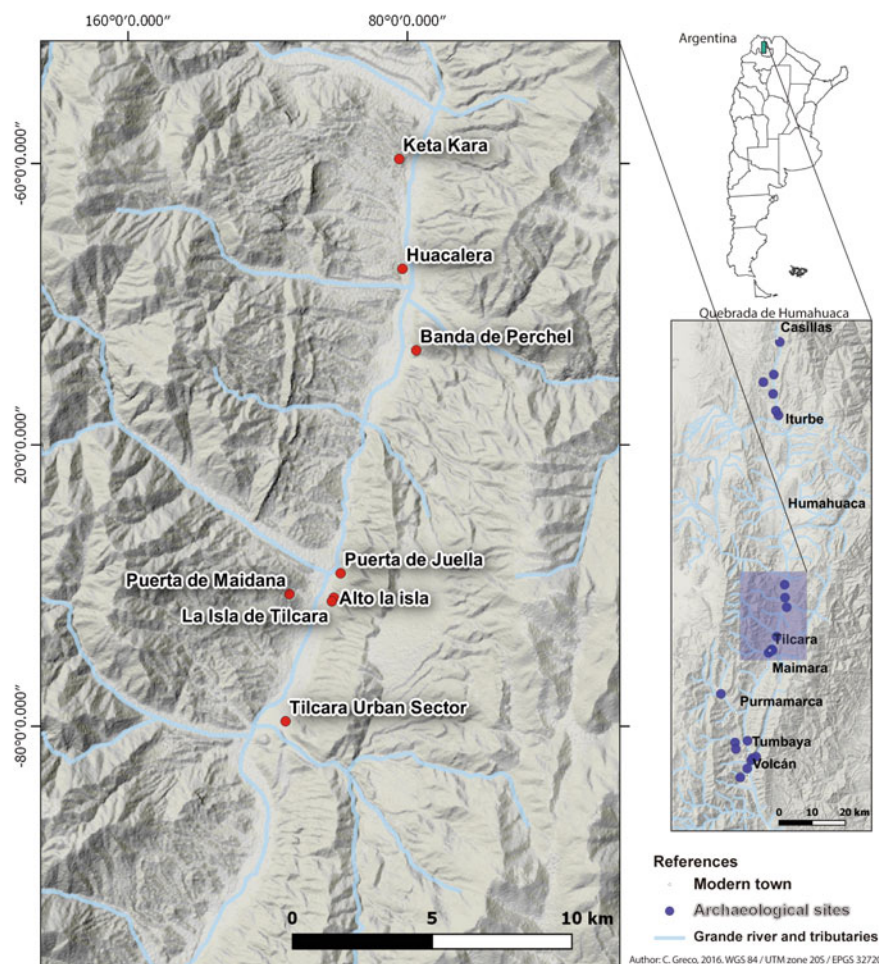


Fig. 1 Location of the archaeological sites in the middle sector of the Quebrada de Humahuaca

Hispanic-indigenous (1536 AD), and Colonial (1640 AD) Periods (González and Pérez 1966, 1972). In Quebrada de Humahuaca, the Early Period was represented by the Estancia Grande site although investigators note that information is scarce due to a lack of research. The final phase of the Middle Period was represented by La Isla de Tilcara and Alfarcito, while several sites such as Pucaras de Tilcara, Yacoraite, and Hornillos y Juella were representative of the Late Period. The Inca Period was particularly identified in sites such as Pucara de Tilcara and La Huerta. This scheme was extensively used since the moment of its enunciation as a general proposal for the Argentinian northwest. Yet, once again, in the case of Quebrada de Humahuaca the application of this scheme was only partial due to inherent difficulties regarding lack

of radiocarbon dates as well as inconsistencies that appeared during the advancement of investigations.

From the 1980s it was possible to progressively increase the number of dates obtained in the Quebrada at the same time that investigations started to incorporate new sites and problems that resulted in the generation of unprecedented information. Since then new schemes have been proposed, some of them emulating the first one as in the case of the work by Raffino (1991: 4) who tried to develop a comprehensive overview taking the Argentinian northwest as the application scale. In that case the proposed periods were Formative, segmented into Lower (500 BC–400 AD) and Upper (400–900 AD); Local Development (900–1471 AD); Inca Horizon (1471–1532 AD), and Hispanic-indigenous (1535–1660 AD).

As regional investigations expanded, some discordance in the application of pre-existent chronology models started to be detected. This is the reason why Nielsen (1997, 2001) proposed a new scheme, using every piece of information produced for Quebrada de Humahuaca, in which he distinguished five periods: Formative, Local Developments I, Local Developments II, Inca, and Hispanic-indigenous (op cit. 2001: 181).

These models were proposed for different analytical scales—González and Pérez (1972) addressed the whole Argentinian northwest while more recent proposals (Nielsen 2001, 2007) focused on a regional and more precise scope. They achieved a correlative organization of pre-Hispanic occupation periods in the Quebrada considering spanning from first village developments to European conquest. Nevertheless, we consider it necessary to re-read these temporal schemes based on information derived from new radiocarbon results as well as other material variables which will be discussed below. The approach developed in this chapter, unlike the ones commented upon so far, presents a narrower analysis scale, since it focuses on a segment of the central sector of Quebrada de Humahuaca, thus allowing us to recognize specific processes that may have had a circumscribed occurrence. That is why our proposal is mainly centered on the discussion of these processes as a main axis and does not strictly speaking constitute a temporal scheme.

For a previously presented contribution (Otero and Rivolta 2015) we analyzed new radiocarbon results from the recognition of the Formative Period initial stages in the urban area of Tilcara. Having considering every piece of evidence recovered from systematic excavations from archaeological rescues, we assigned these sites a temporality between II and XII centuries AD. Scarcity of evidence regarding this timespan could be the result of dynamic processes such as mud flows, common in this sector of the Quebrada, with consequent covering of evidence which of course adds to sampling problems, along with the lack of investigations connected to these first village developments. The next occupation instance would have extended between XII and XIV centuries AD and, considering available information, it presented two clearly distinguishable set of settlements and materialities designated as Early Humahuaca and Isla. This is crucial for the understanding of the problem reflected in the radiocarbon date results which also poses a different view to that commonly offered. Regarding the so called Isla moment, previous investigations have considered the pottery recovered in La Isla de Tilcara, defined as the “type site” (Debenedetti

1910), as representative of the Middle Period in Quebrada de Humahuaca (Bennett et al. 1948; González and Pérez 1972; Pérez 1973), a position maintained through time despite the lack of radiocarbon dates. Nevertheless, and based on more recent research, it is becoming difficult to endorse this point of view considering that Isla's manifestations would be clearly posterior to the signaled lapse. Besides this, from repositioning Isla's moment in local chronologies, this statement forces us to rethink the dynamics after the XII century in the region, since the development initially proposed as belonging to the Upper Formative or Middle Period must currently be discussed as an event occurring later in time and, at the same time, contemporaneous to other local developments. In such a way, the current Isla's interval would be similar to an Early Humahuaca, which in the classic chronology corresponds to the Late and not Middle Period. In the following sections we shall discuss both contexts in order to develop a new hypothesis regarding this new scenario.

2 Landscape

Landscape is considered as a construction defined in time and space by communities with members who create and manipulate culture and material symbols in order to express ethnic or cultural boundaries based on manners or ways of thinking and shared expressions, which may not have other justification than tradition itself. If a living landscape is a relational entity formed by people and their commitment to the world, we can deduce that different peoples can experiment and comprehend the landscape in different ways. Thus, we could say that landscapes are multiple or fragmented. The notion of landscape is not then a synonym of the natural environment but it constitutes a world of cultural products, where communities transform the physical space in meaningful places, representing the stage of every communal activity. These landscapes are basic for the implementation of survival and support mechanisms in populations. They are dynamic constructions in which every community and generation imposes their own cognitive map over a world of meanings (Ansuetz et al. 2001). Therefore, different development moments are uniquely identified in relation with a landscape and that is the reason why we will now present a detailed overview of the Formative, Isla, and Early Humahuaca particularities in this new information context.

2.1 *Formative*

This occupation moment is represented in the region by exiguous archaeological evidence mainly concentrated, at least so far, in the Tilcara urban sector. The conducted investigations were part of rescue activities in the urban area of town, and that is why findings probably spatially correlated do not allow us to approach a definition of a village model, as is the case in other northwest regions. The sites

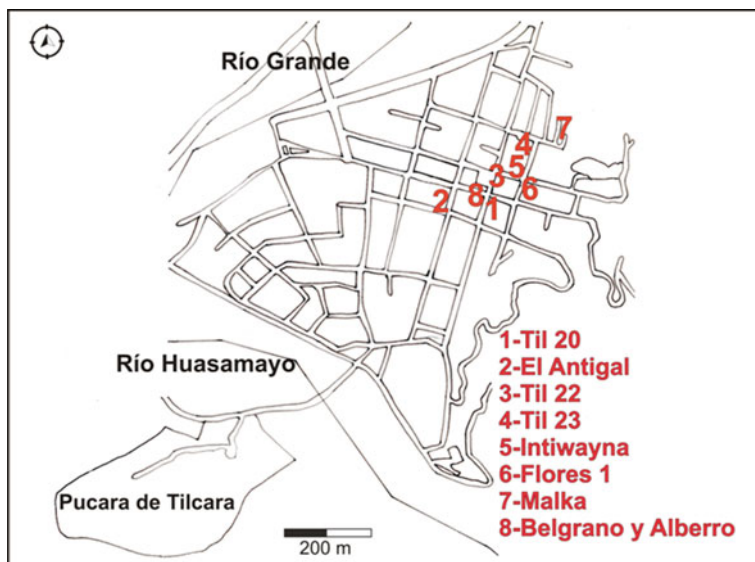


Fig. 2 Layout of Tilcara and location of the sites attributed to Formative Period

occupied between the II and XII centuries, among which we can highlight Til.20 (Mendonça et al. 1991), El Antigal (Madrado 1968), Til.22 (Rivolta and Albeck 1992; Rivolta 1996), Til.23 (Aleksandrowicz 1987a), Intiwayna (Rivolta et al. 2010), Flores 1 (Mecolli et al. 2004; Seldes 2006), Malka (Nielsen 2001), and Belgrano y Alberro (Tarragó and Albeck 1997), account for settlements in the proximity of the Río Grande, all at similar altitudes, but presenting contexts altered by recent urbanization and flood phenomena (Fig. 2). The aforementioned sites exhibit diverse aspects of these kinds of societies, among which we detected domestic and funerary spaces when considering the results obtained through archaeological rescues performed at different moments.

2.2 *Early Humahuaca*

This set of sites constitutes one of the facets in the regional occupation between the XII and XIV centuries. From Early Humahuaca we start to register a clear predominance of occupations in the subsidiary quebradas as well as in the shores of the Río Grande, in terraced sectors slightly elevated, a condition clearly distinctive to Formative tendencies. The set of considered sites includes Banda de Perchel (Rivolta 2003b), Puerta de Maidana (Schuel 1930; Aleksandrowicz 1987b; Rivolta 2003b), and Alto de la Isla (Rivolta 2000, 2003b) among others, arranged on the slopes of low-altitude hills in a stepped way similar to cultivation terraces (Fig. 1). A shared feature between these settlements is the lack of internal organization of

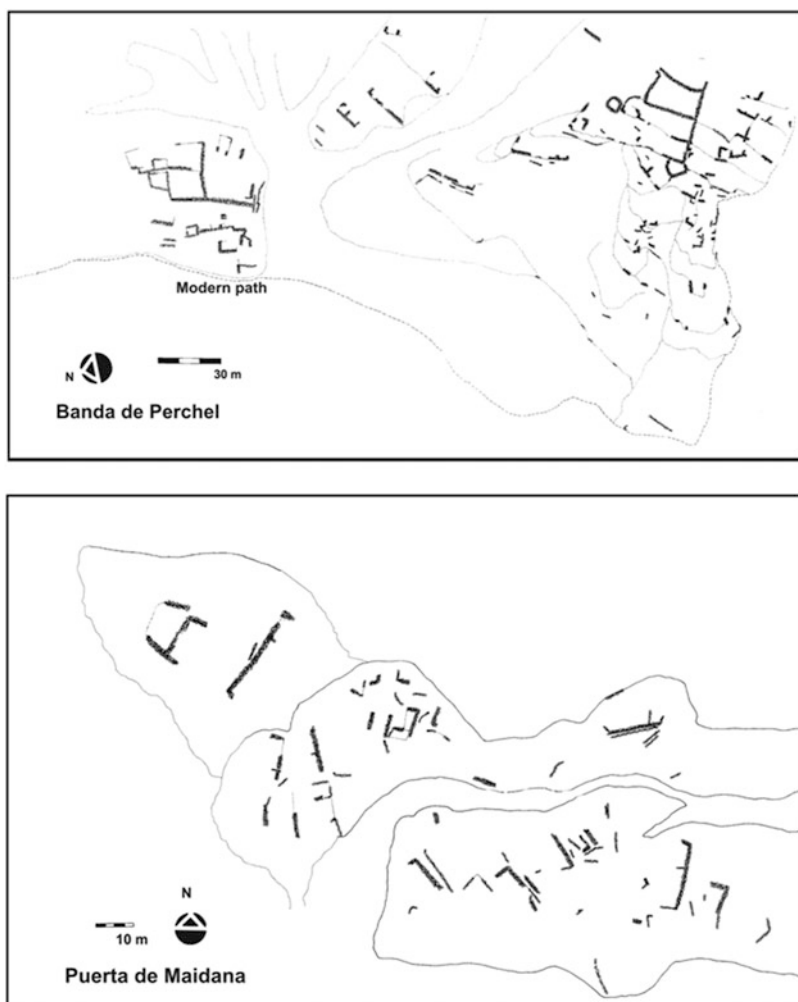


Fig. 3 Banda de Perchel and Puerta de Maidana's planimetry

enclosures, with terraces as their constructive unit and no presentation of *plazas*, secondary discard sectors, corrals, etc. (Fig. 3). This type of articulation with the landscape marks a clear distinction with Formative sites, but also represents a striking contrast with other contemporaneous sites, such as the ones belonging to Isla's occupations.



Fig. 4 Puerta de Juella and Keta-Kara's planimetry, taken from Raffino (1991) and Pelissero (1995) respectively

2.3 *Isla*

Unlike sites on domestic terraces, these settlements, not exceeding 2 acres in area, present a different type of internal organization, at least regarding the layout of their residential sectors. This layout can be described as having enclosures with a high concentration of structures placed on leveled sectors (Fig. 4). We have come to call them small clusters in contrast to big clusters which can reach up to 10–15 acres. These big clusters are called *pucaras*, and they present a dense building pattern and were occupied later in time.

The information obtained comes from excavations performed several decades ago, and that is why it is fragmentary and focused on surveying inhumation sectors, as in the case of La Isla de Tilcara (Debenedetti 1910; Casanova 1937), Keta-Kara (Pelissero 1995), and Puerta de Juella (Casanova 1937; Raffino 1991). For example, in the first of the mentioned sites the investigators did not take into consideration the walls of the enclosures near the burials. In this sense, La Isla is more than a cemetery, as Debenedetti defined it (1910). This site constitutes a town with similar characteristics to the aforementioned (Rivolta 2000). In the case of Keta-Kara it was possible to define secondary discard spaces (Nielsen 1997) and some shallow approximations to occupational floors (Pelissero 1995).

3 Materiality

Here we shall consider the material assemblages recovered from excavations performed in the mentioned sites, particularly emphasizing pottery remains which are equally represented at every site. Other elements of the materiality may or may not be present in the different assemblages, a circumstance hindering comparative studies, although in certain cases they complement the current analysis.

3.1 *Formative*

By Formative pottery we understand, clearly alluding to the Lower Formative (Raffino 1991), the assemblages recovered in the Tilcara urban sector, particularly the ones from archaeological rescues, among which we can mention Til.20 (Mendonça et al. 1991), Til.22 (Rivolta and Albeck 1992; Rivolta 1996), Til.23 (Aleksandrowicz 1987a), Malka (Nielsen 2001), Intiwayna (Rivolta et al. 2010), and Flores 1 (Seldes 2006) as the more relevant ones. Different interventions have allowed us to acknowledge pottery diversity, commonly from mortuary spaces, focusing on two main typological groups: ordinary and painted ceramics. From an iconographic perspective, the presence of decorative attributes refers to a limited percentage of pieces and fragments, as opposed to ordinary pottery. Formal diversity within the assemblage include: tubular pots, straight walled vessels, ovoid pots, pipes, bowls, and scarce modeled zoomorphic pieces (Fig. 5). Regarding



Fig. 5 Different ceramic pieces corresponding to Formative Period, recovered from the Tilcara urban area

iconography, the only decorative motif registered is parallel lines combined with zigzag lines drawn in black over red engobe.

We also recovered non-local pottery fragments, which based on the petrographic analysis of one of the fragments was attributable to the Black Polished San Pedro style from the Atacama area. Likewise, among allochthonous pottery we registered cases of fragments corresponding to the San Francisco Complex, specifically in the findings at Hotel El Antigal (Madrazo 1968) and Malka.

3.2 *Early Humahuaca*

The assemblages representing this occupation were recovered in excavations of domestic terrace sites, among which we can mention Banda de Perchel (Rivolta 2003b), Puerta de Maidana (Schuel 1930; Aleksandrowicz 1987b; Rivolta 2003b), and Alto de la Isla (Rivolta 2000, 2003b). One of the most noteworthy aspects of these assemblages is the preponderance of ordinary fragments, a feature shared by every site with these characteristics. Regarding form determinations, these assemblages are composed of a majority of bowls and pots, and within the former the Black Polished Interior pieces, with different degrees of surface treatment, are the most popular variety (Fig. 6). In the cases of fragments with visible designs, these were identified as reticulated with motifs resembling fingers from a hand in the lower parts.

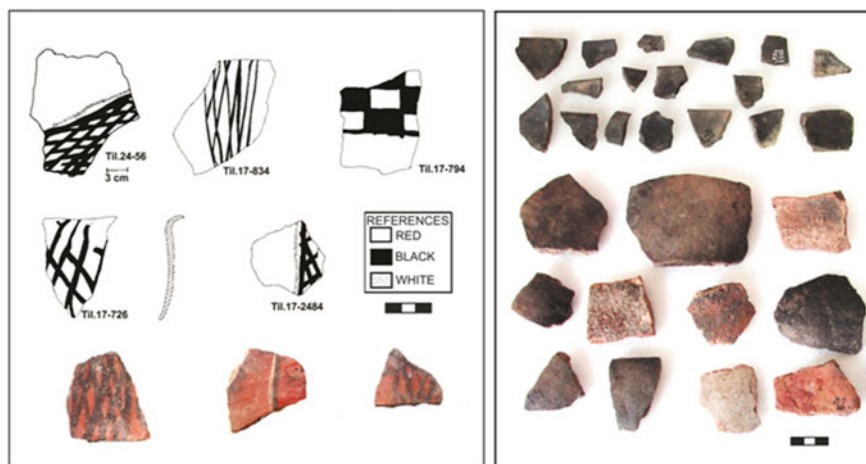


Fig. 6 Assemblage pottery fragments corresponding to Early Humahuaca. *Left* Black over red fragments. *Top, right* Black polished interior. *Bottom, right* Ordinary style

3.3 *Isla*

Ceramic pieces corresponding to collections recovered in La Isla de Tilcara (Debenedetti 1910), Keta-Kara (Pelissero 1995), and the Huacalera Collection (Rivolta 2003b), along with archaeological rescues in Tilcara's urban sector sites such as El Manzano (Otero 2013; Otero and Rivolta 2015), Hotel Las Marías (Otero and Rivolta 2015), Jujuy Street (Rivolta 1994), Tilcara's Train Station (Rivolta 2003a), and Tilcara's Parochial Church and Belgrano Street (Otero and Rivolta 2015) are generically denominated as "La Isla" considering the original findings in the homonymous site. The provenance of these assemblages is different from other cases since some pieces were obtained through archaeological rescue tasks while others where the result of excavations with different degrees of systematization. In the latter, a great majority of pieces were obtained in the excavation of burial sites (Keta-Kara, La Isla de Tilcara, and Huacalera) as part of the grave goods.

The particularities of these assemblages are related to their originality degree, whose pottery presents unprecedented forms and decorative motifs both for Formative moments and fragments and pieces typical of later times. Regarding the forms registered, these assemblages feature a repertoire of vases with waists and ring thickenings, pots, and bowls being among the most outstanding. If we consider iconography alone, Isla's assemblages are highly heterogeneous especially regarding the diversity of combinations of decorative elements. The use of white and black paint over red backgrounds is registered defining motifs such as: stripped and reticulated triangles, staggered motifs, white dots, spiraled triangles, checker-board patterns, jagged lines, spirals, and reticulations, among others (Fig. 7). It is worth mentioning anthropomorphic and zoomorphic representations given their common appearance as modeled or painted figures, reflecting significant diversity in both cases. Anthropomorphic figures present variable ways of depicting faces and headdresses/hats; while zoomorphic includes local fauna, camelids, and different birds.

Within these assemblages we also found non-local pottery represented by pieces from Bolivian Altiplano (Yura) and Yavi styles using purple and buff for engobes; as well as the presence of scarce anthropomorphic pieces that could be from northern Chile (Fig. 8). Moreover, non-local pieces are only associated to these assemblages, except in the case of Yavi styles which can also be found in later times in pieces with different forms and iconographies.



Fig. 7 Isla pottery



Fig. 8 Non-local pottery

4 Radiocarbon Datings

In order to evaluate the chronology of the observed trends in pottery and social landscape, we conducted a Bayesian analysis of all radiocarbon datings available for the region. In total we have 23 radiocarbon datings from several archaeological sites. Formative is represented by Til.22 (Rivolta 1996; Tarragó and Albeck 1997) and Malka (Nielsen 2001). In the Early Humahuaca the dated sites are Puerta de Maidana (Rivolta 2003b), Alto de la Isla (Rivolta 2000, 2003b), and Banda de Perchel (Rivolta 2003b). For Isla, the sites are El Manzano (Otero and Rivolta 2015), Keta-Kara (Rivolta 2013), and Hotel Las Marías (Otero and Rivolta 2015). To evaluate the duration and order of events we used a uniform phase model (Buck et al. 1996), assuming that the whole set of phenomena within a phase has the same probability of occurrence in every moment. The sum of probabilities of the calibrated datings and the boundary parameters were also calculated. These analyses were performed using OxCal v4.2 software (Bronk Ramsey 2009) along with the southern hemisphere calibration curve SHCal13 (Hogg et al. 2013). The type of model used is of three overlapping phases (Bronk Ramsey 2009), allowing the phase boundaries to be independent and unconstrained from each other. These represent the hypothesis that there might be contemporaneity, at a regional level, between them. However, the Formative is only contemporary to the Early Humahuaca and Isla in its final segment.

To discuss calibrated dates and statistical parameters, ranges of 95.4 and 68.2% confidence intervals were used. The overlapping phase model used tends to return relatively scattered distributions (cf. Greco 2016, this volume) and it can be difficult

to interpret in processual terms. For that reason, sometimes we refer to point estimates in order to simplify. Research has shown that there is no way to correctly estimate the true age of a given radiocarbon date with a point estimate (Michczyński 2007), although several authors agree that the median or also the mode—the zone of maximum probability in the density function of the calibrated date—is acceptable (Zeidler et al. 1998; Needham et al. 1997; Michczyński 2007; Alberti 2013).

The Bayesian statistical model showed agreement indexes of $A_{\text{model}} = 90.7$ and $A_{\text{overall}} = 92.5$, meaning that the hypothesis is highly acceptable. The results are summarized in Fig. 9 and Table 1 showing the posterior estimates for the start and end boundaries and also the sum of probabilities of each phase.

For this dataset, Bayesian analysis allowed us to estimate that the start of the Formative fell somewhere between 10 BC–420 AD, with a 95% confidence range.

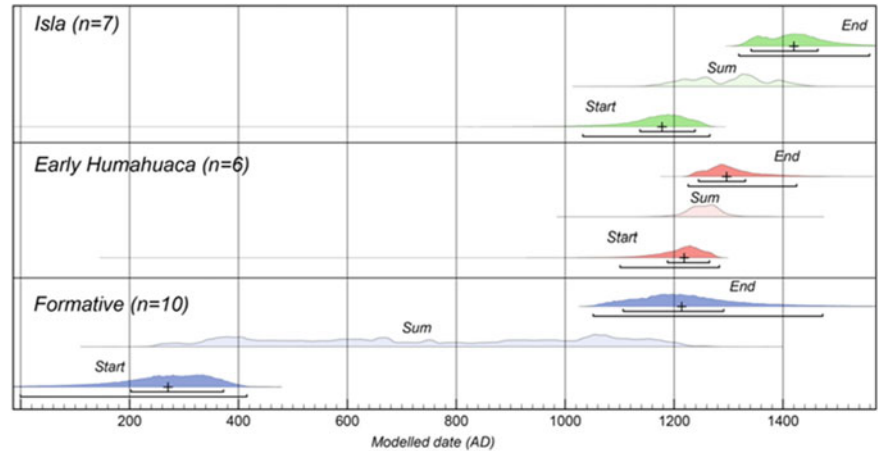


Fig. 9 Probability plots of posterior estimates for the start and end boundaries and the sum of probabilities of Formative, Early Humahuaca, and Isla. The “+” represent the location of the median value

Table 1 Posterior estimates for the start and end boundaries of the Formative, Early Humahuaca, and Isla Periods

| | Boundaries | Modeled dates AD 68.2% probability | Modeled dates AD 95.4% probability | Median | Mode |
|-----------------|------------|---------------------------------------|---------------------------------------|--------|------|
| Formative | Start | 200–380 | 10 BC–420 | 270 | 340 |
| | End | 1110–1300 | 1050–1480 | 1210 | 1200 |
| Early Humahuaca | Start | 1180–1270 | 1100–1290 | 1220 | 1230 |
| | End | 1240–1340 | 1220–1430 | 1300 | 1280 |
| Isla | Start | 1130–1240 | 1030–1270 | 1180 | 1190 |
| | End | 1340–1470 | 1310–1560 | 1420 | 1420 |

However, with a mode at 340 AD and a median at 270 AD we think that the beginning occurred during 3rd or 4th century onward. This moment is related with the consolidation of village life, with evidence focusing mostly on the Tilcara urban area. Possibly, the absence of other records for this interval is due to post-depositional processes or sampling bias.

The end of the Formative coincides with the start of the Early Humahuaca, with medians and modes between 1200 and 1230 AD. Early Humahuaca would have lasted until 1220–1430 AD (95% confidence range) with a median of 1300 AD and a mode of 1280 AD. Those average dates strongly coincide with the time indicated by other authors as the limit between Early and Late Regional Developments Period (RDP) (Nielsen 2007).

Isla is somehow chronologically independent and parallel to the Early Humahuaca. It may have started a few decades before, between 1030 and 1270 AD (95% confidence range) with a median of 1180 AD and a mode of 1190 AD. Instead, the end of Isla was quite a bit later between 1310 and 1560 AD (95% confidence range) with a median and a mode of 1420 AD, meaning that the use of Isla pottery could have occurred in contemporaneity with the regional Late Humahuaca (Nielsen 2007; Greco and Otero 2016).

We think that the chronological position of the Isla is the main result of this analysis, showing that it is a process contemporaneous with other local developments.

5 Some Working Hypotheses

Some issues raised here are based on the discussion of recently obtained radio-carbon datings from several sites in the region, covering a range between the II and XIV centuries. These results constituted the starting point for proposing a shifting paradigm regarding the Isla moment and its classic chronological positioning. While these datings serve to consolidate the proposal, this was previously observed through comprehensive analyses of materiality, especially pottery, in which we detected discrepancies while comparing pieces from collections from the different sites. This fact, and the chronological repositioning, led us to question the reasons why two populations with so different materialities were living in the central sector of Quebrada de Humahuaca.

There is no doubt that spatial perception through time implies acknowledging that Formative groups, particularly the ones located in the Tilcara urban area, signaled the start of the so-called village occupations, although available information is insufficient to support this argument. Nevertheless, it is clear that these groups were located as near to the hydric resource of the Río Grande as they could, and at the same height above sea level. Approaching the XII century new and different manifestations appeared in relation to the Isla and Early Humahuaca moments, which undoubtedly implied a drastic change in location and construction of the surrounding space. Disparity between settlements is powerful evidence;

while Isla sites have an average size of no more than 2 acres presenting a complex and compressed layout with a significant density of enclosures (Fig. 4), Early Humahuaca sites (Fig. 3), on the contrary, have an average size of 6 acres with an uncompressed and extended organization in the landscape, and residential units located on terraced slopes. In this sense, it is worth mentioning that Isla sites were not re-used; they present a single occupation and were abandoned after the XIV century. On the other hand, some terraced sites were abandoned while others were reconditioned, giving origin to big conglomerates identified in the classic literature as *pucarás*.

In the same way, the differences in pottery assemblages are given between formal and decorative attributes. Thus, Early Humahuaca is mainly represented by ordinary fragments, with presence of Black Polished Interior bowls and decoration referring to hands and reticulations, although the two last are low in percentages. On the other hand, Isla's characteristic ceramic forms like vases with waists and pots (Fig. 7) which define this assemblage's identity, resemble some pieces found in the Altiplanic zone, like for example that of the Mollo Culture (Arellano López 1978, 1985; Faldín 1985: 91—Form A and variants. Proposals about the emergence of the “Tricolor Southern Horizon” (Lumbreas 1960), related to the consolidation of post Tiwanaku kingdoms, which possibly had some importance in the definition of local processes in Quebrada de Humahuaca (Lafón 1965; González 1963), can also be considered. Along with local pottery production, Isla collections include clearly allochthonous objects like Yura pieces and fragments from the Altiplano, as well as the presence of a spouted vase of similar origin, an anthropomorphic figure associated with the Valle de Azapa region (Lecoq 1999; Uribe 1999; Daulsberg 1982), and several Yavi pieces.

Another aspect that must be considered is related to the presence of two craniums with deformations typical of the Altiplano (Blom et al. 1998; Bloom 2005; Janusek 2002, 2009) found in Enclosure V, Burial 2 at the Keta-Kara site, as well as a second cranium exhumed at La Isla de Tilcara (N° 3876) mentioned by Dillenius (1913) and Imbelloni (1932) as an example of exceptional cranial deformation among the set of individuals exhumed from these sites (Fig. 10).

The presence of allochthonous objects is likely related to trade circuits with dynamics registered in Quebrada de Humahuaca since the Archaic. These circuits are evidenced during Formative times through scarce fragments corresponding to the San Francisco style, linking the Atacama area with the Yungas. Unlike this context, during Isla's development the pieces and fragments identified as non-local are mainly from the Altiplano, an unprecedented situation in these settlements. Tarragó's investigations (1977) in the Atacama registered La Isla pottery in the cemeteries of this oasis, which implies a circuit likely functioning since early moments, a circumstance that has not been registered yet for the Altiplano. We argue that the events which took place in the central Altiplano since the XII century, related to Tiwanaku's fall, had an impact in Quebrada de Humahuaca, based on the landscape reconfiguration which originated with the arrival of individuals to the region and their installment on an area with scarce evidence of local population concentration. These facts led us to hypothesize that the appearance of small

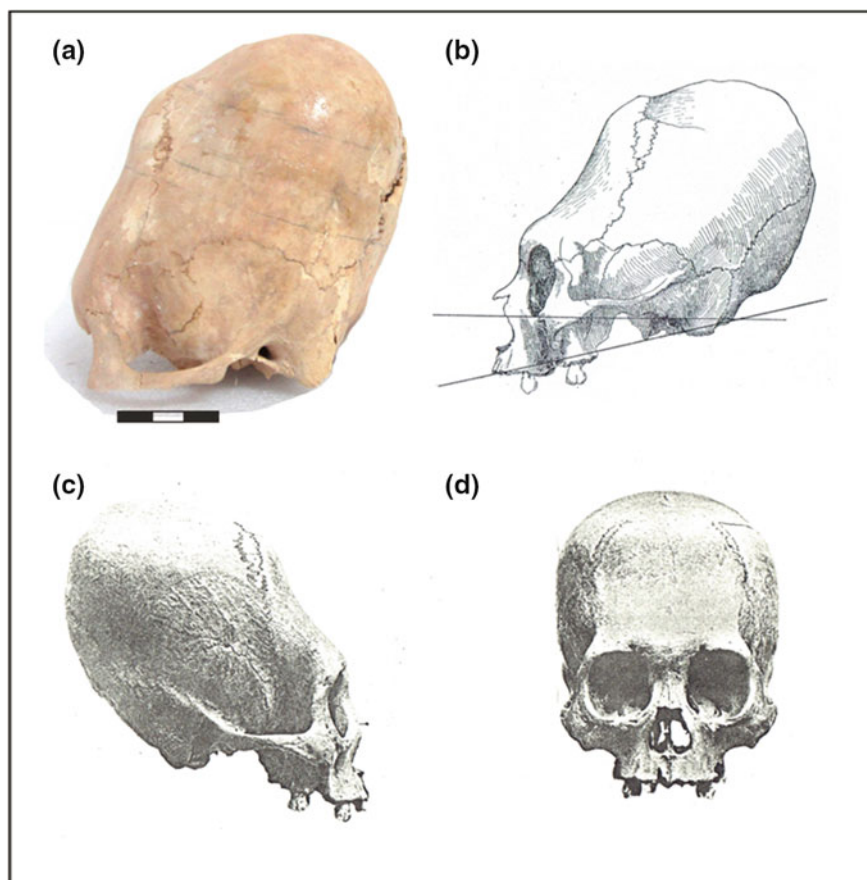


Fig. 10 Crania with Altiplanic deformation. **a** Cranium from Keta-Kara site, **b** cranium from La Isla de Tilcara (N°3876), picture slide taken by Imbelloni (1932), **c** and **d** the same cranium from La Isla de Tilcara (N° 3876), picture slide taken by Dillenius (1913)

conglomerated settlements, in reference to the ones defined for the Isla moment, could be related to the presence of individuals from the Altiplano, while domestic terraced sites would represent an occupational continuity or the identity of local Formative inhabitants.

In this regard, the central sector of Quebrada de Humahuaca showed a differential behavior in relation to its surrounding areas, particularly the oasis in San Pedro de Atacama and the Valle de Azapa, since we have not registered evidence related to Tiwanaku's filiation objects, with the exception of a wooden tablet recovered from Angosto Chico site (Montenegro 2002) and possibly the metal pieces, especially those elaborated in gold, found in Pueblo Viejo de la Cueva and La Isla de Tilcara (Tarragó et al. 2010). This contrasts with the aforementioned cases because in San Pedro de Atacama the burials present several objects as grave

goods (Le Paige 1961; Tarragó 1989; Berenguer and Dauelsberg 1989; Stovel 2001; Uribe and Agüero 2004; Uribe et al. 2016), and in the Valle de Azapa this association was proposed in relation to the Cabuza style (Dauelsberg 1973; Focacci 1982; Goldstein 1996). Nevertheless, based on the strontium isotope analysis from San Pedro de Atacama there is not evidence of population movement from Tiwanaku to the *salar* (salt flat) (Knudson 2008), although adoption of an Altiplanic style for the manufacture of objects was noticed. A later date than that classically considered is proposed for Cabuza style (Korpisaari et al. 2014) based on the Altiplanic influence over this ceramic type. Furthermore, the authors argue that considering radiocarbon dates which are available, Tiwanaku's influence over Cabuza pottery would have been related to processes originated from the collapse of the State and not by the installation of colonies or direct control (op. cit. 422). In this regard, the recreation of Altiplanic styles with local additions could evidence the irruption of this new pottery type in the region, produced by Isla residents.

We have known from decades that the Tiwanaku fall was marked by several factors (Binford et al. 1997; Kolata and Ortloff 2003). Among them, climatic changes linked to aridity and low-temperature events between the XII and XV centuries (Engel et al. 2014) is regarded as one of the causes associated to other socio-political aspects that forced the Altiplanic population to focus on the diversification of resources, particularly pastoralism (Stanish 2003). These and other reasons produced a population movement (Owen and Goldstein 2001; Pärssinen 2003; Janusek 2005; Owen 2005; Smith and Janusek 2014; Sharratt 2016) from the Titicaca area to new and disperse communities and settlement networks, with a starting point near 1100 AD (Janusek 2005). In this sense, Owen (2005) proposes a first-stage defined as a colonizing diaspora in Moquegua and perhaps Cochabamba, while the second stage, which was longer and named by him as victim/refugee, occurred around 1000 AD and was coincident with Tiwanaku's disintegration. The latter stage manifested itself through the settlement of groups in sparsely populated areas recurring to the installation of small, disperse, and defendable villages. Regarding population movements, the material record is clear since in these cases materials appeared abruptly in different settlements without previous antecedents of their presence at a local level (Owen 2005). This situation could be reflecting the issues regarding the Isla moment and its material context.

6 Concluding Remarks

Quebrada de Humahuaca, as part of the Andean region, has had an active role in general processes through the centuries. The starting point of this contribution was centered in the presentation of new evidence, from the application of radiocarbon techniques to material contexts from several sites. Based on this information and complementing it with pottery assemblages and settlement pattern analysis we argue, on the one hand, for the repositioning of the Isla moment between the XII and XIV centuries, unlike classical chronologies which placed it between the VII

and X centuries of the Era. This new temporal organization made itself clear to us in two specific instances: explaining the contemporaneity of sites which were previously considered as part of a consecutive development through time, and providing explanatory proposals enabling the clarification of the reason why both populations showed divergences regarding landscape construction and materiality. Thereby, we suggest as a hypothesis that Isla groups were part of a whole with Altiplanic influences arising in Quebrada de Humahuaca, perhaps originated during the Tiwanaku moments and after its fall, assuming that unlike other regions of the Andes, the one we are studying has not provided any evidence regarding the presence of objects with Tiwanaku's filiation. Nevertheless, we believe that Quebrada de Humahuaca did not remained unaffected by the dynamic of these events and the movement of populations which generated a great dynamism in life conditions between the XII and XIII centuries, although it is probable that these events also propitiated the appearance of unique material manifestations and social practices. It is certainly essential to incorporate new evidence lines to further contrast the hypotheses presented in this paper.

Acknowledgements We particularly thank to Armando Mendoza, Presentación Aramayo, Daniel Aramayo, and the staff of the Archeological Deposit of the Museo Arqueológico "Dr. E. Casanova" (FFyL-UBA) for their collaboration during the revision of the Tilcara urban area, André, Huacalera, Keta-Kara, and La Isla collections.

References

- Alberti G (2013) Issues in the absolute chronology of the Early-Middle Bronze Age transition in Sicily and southern Italy: a Bayesian radiocarbon view. *J Quat Sci* 28(6):630–640
- Aleksandrowicz S (1987a) Informe del rescate arqueológico en la Calle Sorpresa (Flia. Arroyo). Informe inédito Instituto Interdisciplinario Tilcara. Unpublished report
- Aleksandrowicz S (1987b) Informe de los trabajos realizados en el antigal que suponemos debe ser Puerta de Maidana. Informe Conicet, 1987. Unpublished report
- Anschuetz KF, Wilshusen RH, Scheick CL (2001) An archaeology of landscapes: perspectives and directions. *J Archaeol Res* 9(2):157–211
- Arellano López J (1978) La Cultura Mollo: ensayo de síntesis arqueológica. *Pumapunku* 12: 87–113
- Arellano López J (1985) Mollo. Investigaciones arqueológicas. Imprenta Nacional, La Paz
- Bennett WC, Bleiler E, Sommer F (1948) Northwest Argentine archaeology. Yale University Publications in Anthropology N° 38, New Haven
- Berenguer J, Dauelsberg P (1989) El norte grande en la órbita de Tiwanaku. In: Hidalgo J, Schiappacasse V, Niemeyer H, Aldunate C, Solimano I (eds) *Culturas de Chile. Prehistoria*. Editorial Andrés Bello, Santiago, pp 129–180
- Binford MW, Kolata A, Brenner M, Janusek J, Seddon M, Abbott M, Curtis J (1997) Climate variation and the rise and fall of Andean civilization. *Quatern Res* 47:235–248
- Bloom DE (2005) Embodying borders: human body modification and diversity in Tiwanaku society. *J Anthropol Archaeol* 24:1–34
- Blom DE, Hallgrímsson B, Keng L, Lozada MC, Buikstra JE (1998) Tiwanaku 'colonization': Bioarchaeological implications for migration in the Moquegua Valley, Peru. *World Archaeol* 30(2):238–261

- Bronk Ramsey CH (2009) Bayesian analysis of radiocarbon dates. *Radiocarbon* 51(1):337–360
- Buck CE, Cavanagh WG, Litton CD (1996) Bayesian approach to interpreting archaeological data. *Statistics in practice*. Wiley, Chichester
- Casanova E (1937) Contribución al estudio de la Arqueología de La Isla. *Relaciones* 1:65–70
- Dauelsberg HP (1973) La cerámica de Arica y su situación cronológica. *Chungara* 1(2):17–24
- Dauelsberg HP (1982) Prehistoria de Arica. *Revista Diálogo Andino* 1:33–82
- Debenedetti S (1910) Exploración Arqueológica de los Cementerios Prehistóricos de La Isla de Tilcara (Quebrada de Humahuaca, Provincia de Jujuy). *Publicaciones de la Sección Antropológica* N° 6, Facultad de Filosofía y Letras, Buenos Aires
- Dillenius JA (1913) Craneometría comparativa de los antiguos habitantes de La Isla y del Pukará de Tilcara (Provincia de Jujuy). *Publicaciones de la Sección Antropología* N° 12, Facultad de Filosofía y Letras, Universidad de Buenos Aires
- Engel Z, Skrzypek G, Chuman T, Šefrna L, Mihaljevič M (2014) Climate in the Western Cordillera of the Central Andes over the last 4300 years. *Quatern Sci Rev* 99:60–77
- Faldín AJD (1985) La ceramografía de Villa General Peñaranda y sus connotaciones arqueológicas (segunda parte). *Arqueología Boliviana* 2:75–98
- Focacci G (1982) Nuevos fechados para la época del Tiahuanaco en la arqueología del norte de Chile. *Chungara* 8:63–77
- Goldstein PS (1996) Tiwanaku Settlement Patterns of the Azapa Valley, Chile: New Data, and the Legacy of Percy Dauelsberg. *Diálogo Andino* 14(15):57–73
- González AR (1955) Contextos culturales y cronología en el Área Central del N.O. argentino. *Anales de Arqueología y Etnología*, vol XI, Mendoza
- González AR (1963) Cultural development in North Western Argentine. *Smithsonian Institute*, 146, 1, Washington
- González AR, Pérez JA (1966) El Área Meridional Andina. *Actas y Memorias del XXXVI Congreso Internacional de Americanistas*, vol. 1, Sevilla, pp 241–265
- González AR, Pérez JA (1972) Argentina indígena, vísperas de la conquista. *Paidós*, Buenos Aires
- Greco C (2016) Statistical analysis of radiocarbon datings from the Center-South sector of Quebrada de Humahuaca. In: Scaro A, Otero C, Cremonte MB (eds) *Pre-Inca and Inca pottery. Quebrada de Humahuaca, Argentina* (in press)
- Greco C, Otero C (2016) Chronology of settlements with pre-Incan and Incan occupations superimposed. The case of Pucará de Tilcara (Humahuaca gorge, Argentina). *Archaeometry* 58 (5):848–862
- Hogg AG, Hua Q, Blackwell PG, Niu M, Buck CE, Guilderson TP, Heaton TJ, Palmer JG, Reimer PJ, Reimer RW, Turney CSM, Zimmerman SRH (2013) SHCal13 Southern Hemisphere Calibration, 0–50,000 years cal BP. *Radiocarbon* 55(4):1889–1903
- Imbelloni J (1932) Sobre un ejemplar mimético de deformación craneana: el cráneo 3876 de La Isla de Tilcara (Jujuy, Argentina). *Anales del Museo Nacional de Historia Natural* 37:193–208
- Janusek JW (2002) Out of many, one: style and social boundaries in Tiwanaku. *Latin Am Antiq* 13(1):35–61
- Janusek JW (2005) Collapse as Cultural Revolution: power and identity in the Tiwanaku to Pacajes transition. *Archaeol Papers Am Anthropol Assoc* 14:175–209
- Janusek JW (2009) Residence and ritual in Tiwanaku. In: Manzanilla L, Chapdelaine C (eds) *Domestic life in prehispanic capitals: a study of specialization, hierarchy, and ethnicity*. *Memoirs* 46, Ann Arbor, pp 149–169
- Knudson KJ (2008) Tiwanaku influence in the South Central Andes: strontium isotope analysis and Middle Horizon migration. *Latin Am Antiq* 19(1):3–23
- Kolata AL, Ortloff CR (2003) Agroecological perspectives on the decline of the Tiwanaku State. In: Kolata AK (ed) *Tiwanaku and its hinterland: archaeology and paleoecology of an Andean civilization*. *Smithsonian Institution Press*, Washintong, pp 181–202
- Korpisaari A, Oinonen M, Chacama J (2014) A reevaluation of the absolute chronology of Cabuza and related ceramic styles of the Azapa Valley, Northern Chile. *Latin Am Antiq* 25(4):409–426
- Lafón CR (1965) Tiempo y cultura en la provincia de Jujuy. *Etnia* 2:1–5

- Lecoq P (1999) Uyuni Préhispanique. Archéologie de la Cordillire Intersalar (Sud-Ouest Bolivien). BAR International Series 798. Archaeopress, Publishers of British Archaeological Reports, Oxford
- Le Paige G (1961) Cultura de Tiahuanaco en San Pedro de Atacama. *Anales de la Universidad del Norte* 1:19–23
- Lumbreras LG (1960) Espacio y cultura en los Andes. *Revista del Museo Nacional (Lima)* 29:222–246
- Madrazo G (1968) Alfarería prehumahuaca en Tilcara (Quebrada de Humahuaca, Prov. de Jujuy). *Etnia* 8:16–18
- Mendonça O, Bordach A, Ruiz M, Cremonte MB (1991) Nuevas evidencias del Período Agroalfarero Temprano en Quebrada de Humahuaca: Los hallazgos del sitio Til. 20 (Tilcara, Jujuy). *Comechingonia* 7:29–48
- Mercolli P, Zaburlin MA, Seldes V (2004) Reflexiones sobre los últimos rescates arqueológicos en Tilcara. *Actas del XV Congreso Nacional de Arqueología Argentina, Río Cuarto, Córdoba*
- Michczyński A (2007) Is it possible to find a good point estimate of a calibrated radiocarbon date? *Radiocarbon* 49(2):393–401
- Montenegro M (2002) Análisis preliminar de las tabletas para inhalación de sustancias psicoactivas de la provincia de Jujuy, Argentina. *Pacarina* 2:103–109
- Needham S, Bronk Ramsey C, Coombs D, Cartwright C, Pettitt P (1997) An independent chronology for British Bronze Age metalwork: the results of the Oxford Radiocarbon Accelerator Programme. *Archaeol J* 154:55–107
- Nielsen A (2001) Evolución social en Quebrada de Humahuaca (AD 700–1536). In: Berberian EE, Nielsen AE (eds) *Historia Argentina Prehispánica*. Editorial Brujas, Córdoba, pp 171–264
- Nielsen A (2007) El Período de Desarrollos Regionales en la Quebrada de Humahuaca: aspectos cronológicos. In: Williams VI, Ventura BN, Callegari ABM, Yacobaccio HD (eds) *Sociedades precolombinas surandinas: temporalidad, interacción y dinámica cultural del NOA en el ámbito de los Andes Centro-Sur*. Editorial Buschi, Buenos Aires, pp 235–247
- Nielsen AE (1997) Tiempo y Cultura Material en la Quebrada de Humahuaca 700–1650 d.C. Serie Monografías, Instituto Interdisciplinario Tilcara, Facultad de Filosofía y Letras, UBA
- Otero C (2013) Producción, usos y circulación de bienes en el Pucará de Tilcara (Quebrada de Humahuaca, Jujuy). PhD dissertation, Universidad de Buenos Aires
- Otero C, Mercolli P (2008) Consumo y circulación de objetos cerámicos de Tilcara. Tres ejemplos de distintos contextos funerarios. Resúmenes de las IX Jornadas Regionales de Investigación en Humanidades y Ciencias Sociales, en Suplemento de Cuadernos 34: 227–228. Jujuy
- Otero C, Rivolta MC (2015) Nuevas interpretaciones para la secuencia de ocupación de Tilcara (Quebrada de Humahuaca, Jujuy). *Intersecciones en Antropología* 16:145–159
- Owen BD (2005) Distant colonies and explosive collapse: the two stages of the Tiwanaku diáspora in the Osmore drainage. *Latin Am Antiq* 16(1):45–80
- Owen BD, Goldstein P (2001) Huari y Tiwanaku: Modelos vs. Evidencias. *Boletín de Arqueología UCP* 5:169–188
- Pärssinen M (2003) Copacabana ¿el nuevo Tiwanaku? Hacia una comprensión multidisciplinaria sobre las secuencias culturales post-tiwanacotas de Pacasa, Bolivia. *Los Andes: cincuenta años después (1953–2003)*. Homenaje a John Murra AM, Lorandi C, Salazar Soler y Nathan Wachtel (eds), pp 229–280. Pontificia Universidad Católica del Perú, Lima
- Pelissero N (1995) El sitio arqueológico de Keta-Kara en el sistema cultural de la ceja de Puna, Dpto. de Tilcara, Pcia. de Jujuy. Colección Mankacén, CAEA, Buenos Aires
- Pérez JA (1973) Arqueología de las culturas agroalfareras de la Quebrada de Humahuaca (Provincia de Jujuy, República Argentina). *América Indígena* 33(3):667–678
- Raffino R (1991) Poblaciones Indígenas en Argentina. Urbanismo y Proceso Social Precolombino. Tipográfica Editora Argentina, Buenos Aires
- Rivolta MC (1994) Calle Jujuy: nuevos hallazgos arqueológicos en la planta urbana de Tilcara. Unpublished report

- Rivolta MC (1996) Calle Lavalle y Sorpresa: Aportes a la Investigación Arqueológica de la Quebrada de Humahuaca. XXV Aniversario Museo Arqueológico Dr. Eduardo Casanova, pp. 129–135. Instituto Interdisciplinario Tilcara, Facultad de Filosofía y Letras, UBA
- Rivolta MC (2000) 90 años de investigación en la Quebrada de Humahuaca: un estudio reflexivo. Serie Monográfica 5, Instituto Interdisciplinario Tilcara, Facultad de Filosofía y Letras, UBA
- Rivolta MC (2003a) Aportes a la arqueología de Tilcara (pcia. de Jujuy) en relación a observaciones efectuadas por Eric Boman. *Pacarina* 3:287–295
- Rivolta MC (2003b) Los Sitios en Terrazas Domésticas como parte de la Dinámica Social en la Quebrada de Humahuaca (Provincia de Jujuy). PhD dissertation, Universidad de Buenos Aires
- Rivolta MC (2013) Movilidad e Interacción en la Quebrada de Humahuaca: el caso de Keta-Kara (Jujuy-Argentina). Unpublished report
- Rivolta MC, Albeck ME (1992) Los asentamientos tempranos en la Localidad de Tilcara: S.Juj. Til.22, Provincia de Jujuy. *Cuadernos* 3:86–93
- Rivolta MC, Seldes S, Mercolli P (2010) Ocupaciones Tempranas en sectores Urbanos de la localidad de Tilcara (Jujuy, Argentina). *Actas del XVII Congreso Nacional de Arqueología Chilena*, Actas 1:155–163. Valdivia
- Schuel K (1930) Ruinas de las poblaciones indígenas de la provincia de Jujuy. V Reunión Sociedad Argentina de Patología Regional del Norte Argentino: 1430–1451. Buenos Aires
- Seldes V (2006) Bioarqueología de poblaciones prehistóricas de la Quebrada de Humahuaca (Jujuy, Argentina). *Estudios Atacameños* 31:47–61
- Sharratt N (2016) Collapse and cohesion: building community in the aftermath of Tiwanaku state breakdown. *World Archaeol* 48(1):144–163. doi:[10.1080/00438243.2015.1110043](https://doi.org/10.1080/00438243.2015.1110043)
- Smith SC, Janusek JW (2014) Political mosaics and networks: Tiwanaku expansion into the upper Desaguadero Valley, Bolivia. *World Archaeol* 46(5):681–704
- Stanish C (2003) *Ancient Titicaca. The Evolution of Complex Society in Southern Peru and Northern Bolivia*. University of California Press
- Stovel E (2001) Patrones funerarios de San Pedro de Atacama y el problema de la presencia de los contextos Tiwanaku. *Boletín de Arqueología PUCP* 5:375–395
- Tarragó MN (1977) Relaciones Prehispánicas entre San Pedro de Atacama (Norte de Chile) y regiones aledañas: la Quebrada de Humahuaca. *Estudios Atacameños* 5:50–63
- Tarragó MN (1989) Contribuciones al conocimiento arqueológico de los oasis de San Pedro de Atacama en relación con los otros pueblos puneños, en especial, el sector septentrional del valle calchaquí. PhD dissertation Universidad Nacional de Rosario
- Tarragó MN, Albeck ME (1997) Fechados Radiocarbónicos para el Sector Medio de la Quebrada de Humahuaca. *Avances en Arqueología* 3:101–116
- Tarragó MN, González LR, Avalos G, Lamami M (2010) Oro de los Señores. La tumba 11 de La Isla de Tilcara (Jujuy, Noroeste Argentino). *Boletín del Museo Chileno de Arte Precolombino* 15(2):47–63
- Uribe M (1999) La cerámica de Arica 40 años después de Dauelseberg. *Chungara* 31(2):189–228
- Uribe M, Agüero C (2004) Iconografía, alfarería y textilería Tiwanaku: elementos para una revisión del período Medio en el Norte Grande de Chile. *Chungara* 36(2):1055–1068
- Uribe M, Santana-Sagredo F, Maturana A F, Flores C, Agüero P C (2016) San Pedro de Atacama y la cuestión Tiwanaku en el Norte de Chile: Impresiones a partir de un clásico estudio cerámico y la evidencia bioarqueológica actual (400-1000 d.C.). *Chungara* 48(2):173–198
- Zeidler J, Buck C, Litton C (1998) Integration of archaeological phase information and radiocarbon results from the Jama River Valley, Ecuador: a Bayesian approach. *Latin Am Antiq* 9(2):160–179