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PROJECT TAMBO AND ITS SIGNIFICANCE FOR RESEARCH ON PRE-COLUMBIAN SOCIETIES OF THE SOUTHERN PART OF PERU

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Abstract

Since 2008, the Institute of Archaeology of the University of Wrocław, in collaboration with the Catholic University of Santa Maria in Arequipa has been carrying out a research program – Project Tambo – in the southern part of Peru. The project is concentrated on the Tambo River basins, including the border area of Arequipa and Moquegua regions. The research is focused on the issue of settlement changes in the Tambo basin in the context of climate and environmental changes in the period dating back from the end of the Pleistocene to the seventeenth century.

The conducted work has helped to define the chronological sequence of human colonization of the different regions of the valley of Tambo and its tributaries, as well as to explain the importance of this area as an artery of intercultural contacts between the high altitude zone (Altiplano) and the Pacific coastal zone. During the investigation undertaken in this region, previously unknown remains of archaeological cultures and their associated settlement models were documented. Among the registered remains of the prehistoric period, archaeological sites related to the presence of hunter-gatherer societies of the Preceramic era and the earliest agricultural communities were recorded. Remains reflecting expansion in the Tambo Huari basin and Tiwanaku civilization were also documented.

Resumen

A partir del año 2008 el Instituto de Arqueología de la Universidad de Wrocław en la colaboración con la Universidad Católica de Santa María en Arequipa viene llevando a cabo un programa de investigación en el Extremo Sur del Perú denominado Proyecto Tambo. Los trabajos se concentran en la cuenca del Río Tambo que abarca los terrenos situados en la zona fronteriza entre los departamentos Arequipa y Moquegua. El objetivo de la investigación es proporcionar un análisis del asentamiento humano en la cuenca en el contexto de cambios climáticos y medioambientales, a partir del fin del Pleistoceno hasta el siglo XVII.

Los trabajos arqueológicos realizados en la zona permitieron definir la secuencia cronológica de la ocupación humana en diferentes áreas del Valle del Río Tambo y sus afluentes, como también explicar su rol de arteria de intercambio e interacción cultural entre el Altiplano y la faja costera del sur peruano. Asimismo se registró algunas, hasta la fecha desconocidas en la región, evidencias culturales y un patrón de poblamiento específico relacionado con ellas. Entre los descubrimientos más notables se encuentran sitios vinculados con la presencia de las sociedades de los cazadores-recolectores de la Época Precerámica y los primeros agricultores del Período Formativo. Se recuperó también datos que reflejan el proceso de la expansión de las civilizaciones Huari/Wari y Tiahuanaco/Tiwanaku en la cuenca del Río Tambo.

Keywords: excavations, Tambo River valley, stone artefacts, archaeological survey, Tiahuanaco, Incas, Chiribaya, Churajón, Nasca, Chinchorro, Siguan

INTRODUCTION

In the years 2008 – 2012, in southern part of Peru, the Institute of Archaeology of the University of Wrocław conducted an interdisciplinary research project known as Project Tambo. This work focused on the Tambo River basin, covering an extensive zone of border regions of Arequipa and Moquegua, which, together with the Tacna region, located further to the south, are included in the so-called Peruvian southern extreme (*Extremo Sur del Perú* [Figure 1]).

The project was financed by the 7th Framework Programme of the European Union and the Polish Ministry of Science and Higher Education. The Peruvian party was represented by the Catholic University of Santa Maria in Arequipa and the local archaeological conservation services of southern Peru¹.

The aim of the study was to analyse the impact of climate and environmental changes in the Tambo River basin and the adjacent coastal zone from the late Pleistocene to the beginning of the colonial era (16th/17th centuries) on the extent and nature of human settlement. The project was intended to undertake an archaeological survey of the basin area and then – based on results of excavations and laboratory analyses – to define the manner in which prehistoric communities adapted both to global climate change, as well as to periodic climate factors, i.e. to the short-term ones in terms of climatology and of only local or regional range.

It was assumed that, as a result of the undertaken research, a time succession of settlement and depopulation of individual ecological areas of the region would be recorded, and at the same time archaeological cultures existing there would be defined, as well as their chronology and characteristic archaeological material. It was also expected to answer the question concerning the importance of the valley of Rio Tambo itself – the largest watercourse in the region – as a thoroughfare connecting the Andes area, i.e. the Lake Titicaca basin with the coastal zone, as well as the crossing place of far-reaching contacts with communities of areas located both north and south of the valley.

THE GEOGRAPHY OF THE REGION

The region of the study included the Tambo River valley, along with its starting area and the final sections of its tributaries, i.e. the area extending from the river's source to its mouth at the Pacific Ocean near the town Punta de Bombón. The area in question may be divided into three altitude zones of different topography and absolute altitudes, with different climatic conditions and, as it turned out in the course of the study, also different cultural contexts.

The highest mountain zone (zone I) covers the upper part of the Tambo basin, which is located in the altitude zone from 5000 to 3700 m above sea level. Its beginning, on the border of the Moquegua and Puno regions, is marked by the Jucumarini Lake basin (Figure 2), from which flows a small watercourse also called Jucumarini. This river, after changing its name to the Rio Crucero, then to Rio Ichuña, becomes the Rio Tambo slightly above the Yunga village – its confluence with the Rio Paltuture. This confluence of the two rivers near Yunga (3700 m above sea level) marks the border of the highest mountain zone distinguished for the Tambo River basin. A feature of this area is its V-shaped valley with steep slopes, only in certain sections having extensive terraces.

¹ Specialists from different fields of knowledge cooperated in the project. Apart from researchers and students of the University of Wrocław, other participants included scholars from the University of Szczecin, the University of Poznań, the University of Silesia in Katowice and the Archaeological Museum in Głogów. Researchers from the Universidad Católica de Santa Maria in Arequipa, the Universidad Nacional in Ica and the Universidad Central in Bogota (Colombia) as well as students and graduates from Jagiellonian University and the University of Łódź also took part in the field and laboratory work in Peru.



Figure 1. Peru, the Southern Extreme; boundaries of the area covered by the research Project Tambo.

The middle section of the Tambo River basin (zone II) covers the altitude zone situated between the confluence of the Rio Ichuña with the Rio Paltutire (3700 m above sea level) and the mouth of the Quebrada de Huairondo River into the Tambo River (around 1000 m above sea level), hence in the place where the Rio Tambo enters the area of the Arequipa region.

Moreover, in this region both the Tambo River valley and its tributaries cut deeply into the ground forming steep or sometimes vertical slopes (Figure 3). However, within some parts of the valley extensive river terraces mostly of postglacial origin are located high above water level.

The lower section of the Tambo River (zone III) is located in the Arequipa region reaching the northern edge of the Atacama Desert. Here the river valley widens rapidly, and extensive alluvial terraces appear on both of its sides. In its further course the Rio Tambo creates a wide delta (Figure 4). The whole area, on both sides, is sharply limited by steep coastal elevations that extend towards the ocean and then form a chain running parallel to the coastline. The only tributary in this region is the periodic Quebrada de Huairondo River with a deeply cut V-shaped valley.

It should be also noted that characteristic for both the middle and the lower sections of the Tambo River basin is the presence of layers of volcanic ash and pumice with a thickness reaching sometimes up to 2 m. They come from the eruption of the volcano Huainaputina in 1600 (Echevarria y Morales 1600; Thouret *et al.* 1997).



Figure 2. The Jucumarini Lake from which flows a watercourse forming the Rio Tambo.



Figure 3. The middle section of the Tambo River valley near Chojata village.



Figure 4. The El Pino site (sector 4). In the background the Tambo River Delta.

THE COURSE OF THE RESEARCH

A total of 181 archaeological sites were recorded and documented in the area studied during Project Tambo. The analysis of collected material indicated that they came from different periods, starting from the appearance of the earliest hunter and gatherer groups in the late Pleistocene and early Holocene to the beginning of the colonial era. Archaeological excavations were carried out on selected sites of the region in a further stage of the work.

High-mountain zone (zone I)

The research conducted in the high-mountain zone of the Tambo River basin (zone I) was mainly focused on the area above Crucero village and resulted in recording 47 Preceramic archaeological sites². They are located between 4400 and 3860 m a.m.s.l., thus in the Andean puna altitudinal zone (Troll 1943; Pulgar Vidal 1946; Szykulski 2010a: 25). Despite a relatively low population density, a vast majority of the sites are greatly endangered by modern human activity.

Severe weather conditions including high daily temperature amplitudes, which are typical for the Andean puna zone, had an impact on the archaeological research process forcing the division of fieldwork into a few stages related with the changing seasons. Moreover, the elevation of the sites requires adjusting both survey and fieldwork methodology to the Andean climate features.

² In the lower part of the high-mountain Zone I, below Crucero village, 15 other archaeological sites were registered, of which 10 are probably related to the activities of hunter-gatherer groups.

The Tambo River originates from Jucumarini Lake which is located at almost 4400 m a.m.s.l. (cf. Figure 2). It covers an area of around 34 km². The first part of the Tambo River basin down to Crucero village is called Jucumarini River. In this section, due to the fact that the slopes of the valley are mild, numerous Andean *bofedales* are present (Figure 5).

Within the second part, between Crucero and Ichuña villages, the river name changes into Crucero. In this area the valley is a typical V-shaped high mountain valley with high amplitudes of elevation (Figure 6). Its northern slope is characterized by moderate sun exposure which makes it available for small-scale farming.

In general, in Zone I, the river valley is divided into two main types of landscape: puna and valley. The former are the grasslands located on the top of the valley. It is a plain, dry and windy area characterized by severe weather conditions (Figure 7). The latter landscape consists of both mountain slopes and river terraces, which are currently inhabited to some extent.

The archaeological survey conducted near the Jucumarini Lake shores resulted in registering only a few dispersed stone artefacts, thus insufficient data to determine archaeological site limits. It could be related to the activities of minor hunter-gatherer groups, but due to the lack of solid archaeological evidence it is currently impossible to establish precise conclusions.

In Zone I the archaeological sites could be divided into two main concentrations. The first is located just below the Jucumarini Lake (Figure 8), and the second spreads from the massive *quebrada* near Pucara village to Crucero village (Figure 9). The recorded archaeological contexts were identified as Preceramic and strictly related to all kinds of activities of the hunter-gatherer groups.

The sites are located on both the right (28) and left (19) sides of the river. In general no visible tendency was noted and the slight preference for the right side of the river was due to the local terrain features such as slope angle, crossing *quebradas* and river terrace size (Table 1).



Figure 5. The *bofedales* area in the Jucumarini River valley. Photo taken from the Collantane 3 site.



Figure 6. The river valley near Tolapampa village.



Figure 7. High mountain *puna* above the left bank of the valley. In the background Crucero 14 site.

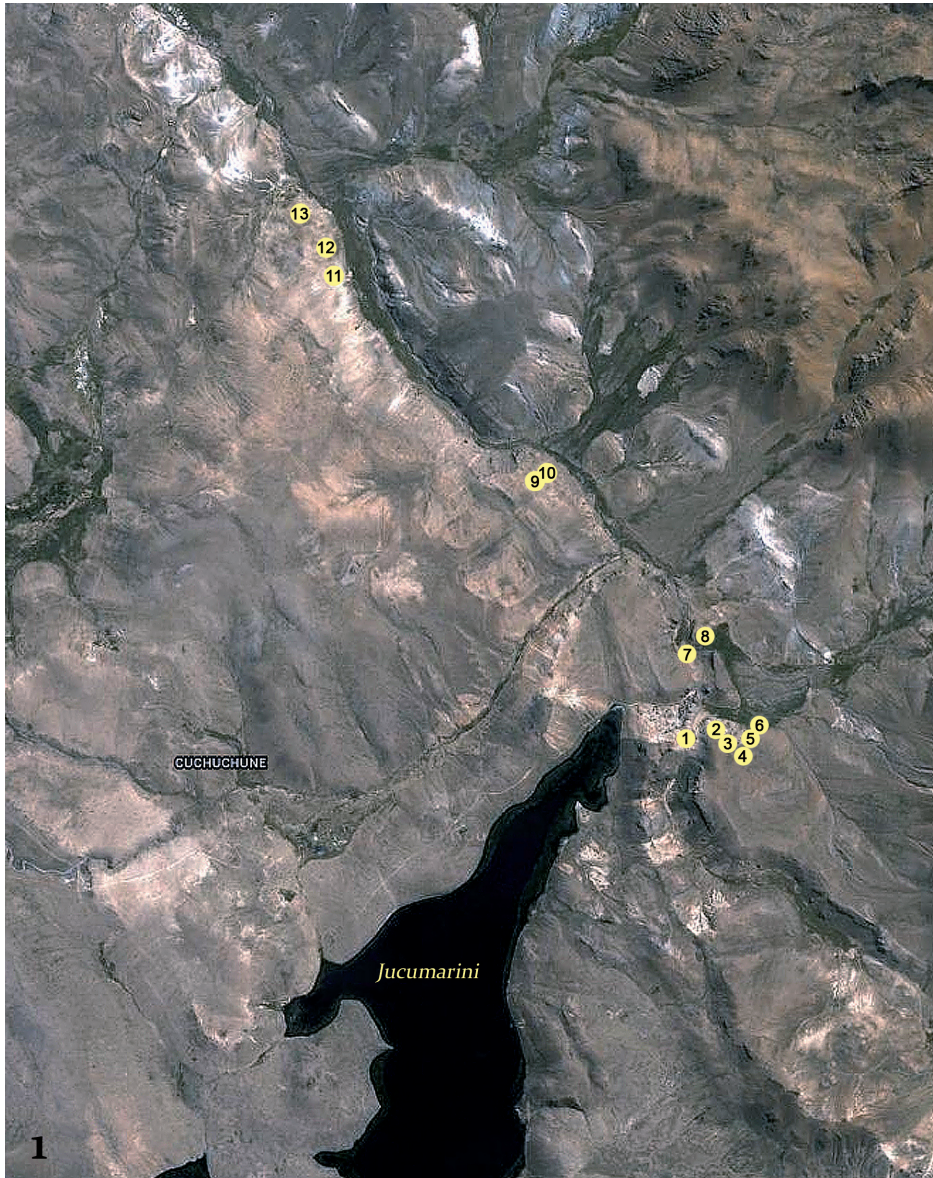


Figure 8. Location of archaeological sites in the Jucumarini region; from: Google Earth; cf. Table 1

During the archaeological surveys two main types of site locations were determined. 70% of the sites are located near or in caves, rock shelters or niches and the other 30% are open sites. Such a significant difference could be caused by the fact that in the research area natural shelters are easily available and provide basic protection with little or no work. However, it should be stated that in the high-mountain area, cave sites are more likely to be registered during this kind of fieldwork.

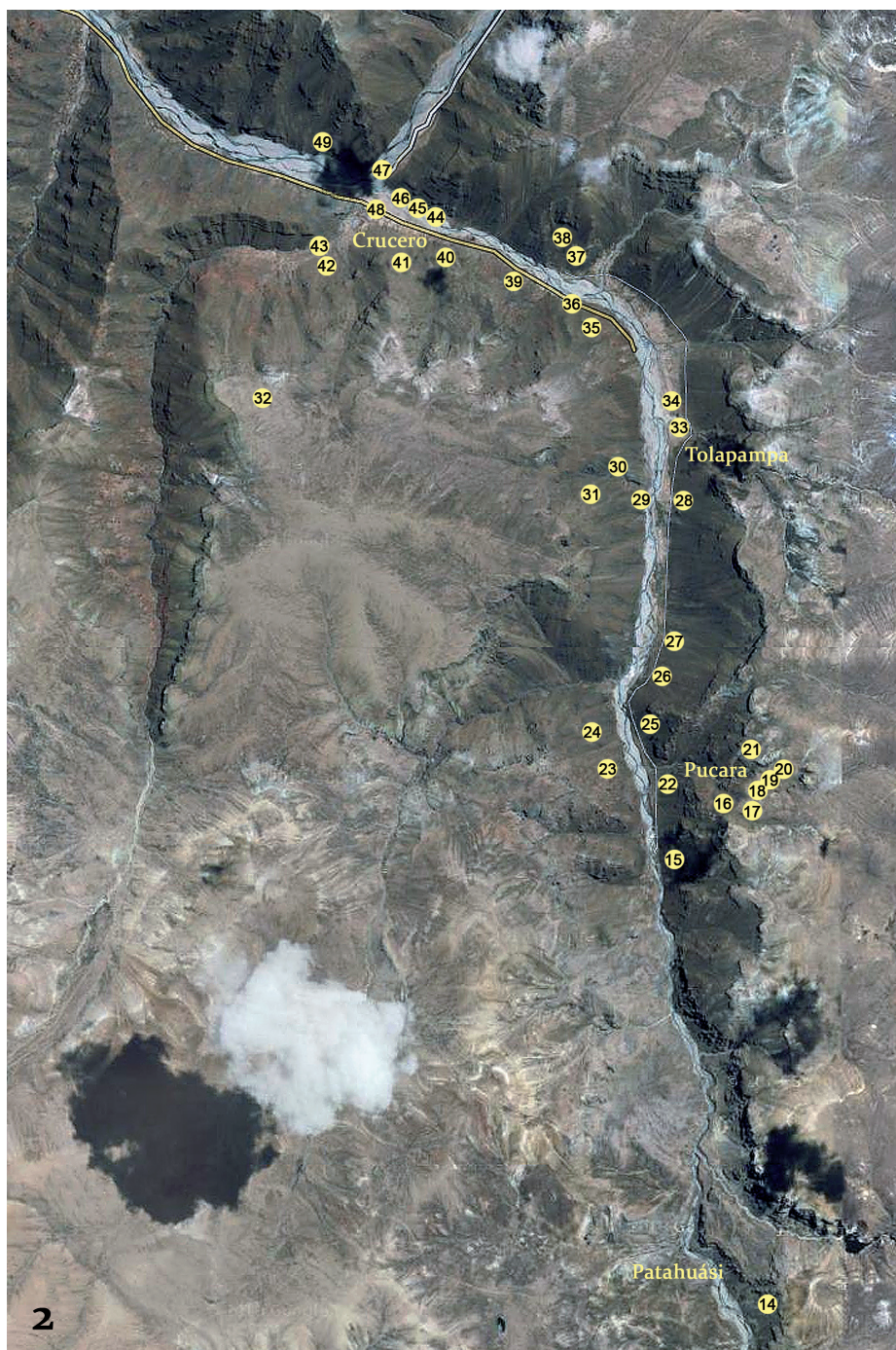


Figure 9. Location of the archaeological sites in the Tolapampa-Crucero region; from: Google Earth; cf. Table 1

Table 1. The archaeological sites in the Jucumarini – Crucero region; cf. Figure 8 and Figure 9.

No Fig. 8, 9	Site name	Site type	Riverbank	Location (mamsl)	No of artifacts	No of tools
11	Bertani 1	cave	left	4336	0	0
13	Bertani 2	cave	left	4322	4	0
12	Bertani 3	cave	left	4308	8	2
5	Collantane 1	cave	right	4317	35	5
4	Collantane 2	cave	right	4349	8	0
6	Collantane 3	cave	right	4327	107	9
3	Collantane 4	cave	right	4387	19	0
2	Collantane 5	cave	right	4307	5	1
1	Collantane 6	cave	right	4400	10	2
48	Crucero 1	open	left	3867	99	9
39	Crucero 2	open	left	3915	28	0
38	Crucero 3	cave	right	3907	211	32
44	Crucero 4	cave	right	3903	89	8
45	Crucero 5	cave	right	3908	13	1
46	Crucero 6	cave	right	3899	114	18
47	Crucero 7	open	right	3875	52	1
49	Crucero 8	cave	right	3879	0	0
43	Crucero 9	open	left	3895	16	4
42	Crucero 11	cave	left	3979	0	0
41	Crucero 12	cave	left	4196	13	3
40	Crucero 13	Spanish edifice	left	3903	4	4
32	Crucero 14	cave	left	4391	46	7
10	Huaychuno 1	cave	left	4366	2	1
9	Huaychuno 2	cave	left	4383	1	1
14	Patahuasi 1	cave	right	4090	43	3
22	Pucara 2	cave	right	4019	15	0
25	Pucara 3	cave	right	3995	181	10
23	Pucara 4	cave	left	4003	29	3
24	Pucara 5	cave	left	4029	8	3
18	Pucara 6	cave	right	4288	217	50
21	Pucara 7	open	right	4305	9	0
26	Pucara 8	Spanish edifice	right	3980	3	3

16	Pucara 9	open	right	4296	36	1
17	Pucara 10	cave	right	4297	37	2
19	Pucara 11	cave	right	4152	24	0
20	Pucara 12	cave	right	4331	23	4
27	Pucara 13	open	right	3956	42	0
15	Pucara 1 Quebrada	open	right	4227	9	1
7	Toclla Laca 1	cave	left	4391	51	9
8	Toclla Laca 2	open	right	4384	12	1
33	Tolapampa 1	open	right	3924	36	4
37	Tolapampa 2	open	right	3896	35	0
36	Tolapampa 3	open	left	3902	0	0
35	Tolapampa 4	cave	left	3905	15	2
29	Tolapampa 5	cave	left	3948	13	1
31	Tolapampa 6	cave	left	4066	3	1
30	Tolapampa 7	cave	left	3933	15	3
28	Tolapampa 8	open	right	3939	132	5
34	Tolapampa 9	open	right	3910	9	2

The group of sites located within rock shelters, niches or caves are in most cases similar in terms of shape and size. The majority of them are currently used to shelter animals, which causes increased devastation of archaeological strata. The remains of cave paintings were identified at Bertani 1 site but due to the lack of other archaeological finds their precise dating could not be established.

There was no visible pattern determined in terms of the distance of cave sites from the bottom of the valley. A few sites are located relatively close to the puna (e.g. Pucara 6), whereas the others are situated near the river (e.g. Crucero 8) (Figure 10). The common feature would be the fact that all of the sites are excellent observation posts.

Among a relatively small group of open sites in Zone I, a location pattern was determined. All sites were situated within large, flat or slightly sloping terrain characterized by a high degree of sun exposure. Particularly worth mentioning is the Crucero 1 site located on the river terrace within the Crucero village borders (Figure 11). The site area is constantly devastated due to both a dirt road running through the middle of the site and illegal clay exploitation. In 2011, in order to document the existing site limits, detailed archeological surveys including total station mapping were conducted. Within the registered lithic assemblage a considerable amount of tools were identified as scrapers. This fact is probably related to hunting activities such as the hide preparation process.

Another example of an open site is Pucara Quebrada, located on a gentle slope near a mountain stream, in the higher part of the valley. In the vicinity of site, 5 niche and cave sites were identified, including Pucara 6 – one of the most abounding with archaeological finds.

During the archaeological surveys a total of 2,021 stone artefacts including 191 tools were registered on the surface of 47 sites. It should be noted that the number of recorded finds at individual sites varies significantly (Figure 12).



Figure 10. The Crucero River valley; Pucara 6 site



Figure 11. The Crucero River valley; Crucero 1 site.

The amount of archaeological material registered at the Crucero 3, Tolapampa 8, Pucara 3 and Pucara 6 sites equals around 37% of the total number. Such a percentage could indicate either longer or more frequent use of the shelters. However, the relatively small number of artefacts recorded at individual sites could be a result of either short-term, incidental use or the poor state of preservation caused by long-lasting erosion or human/animal activity. Moreover, at some of the sites currently being used as shelters for animals a thick layer of animal excrement prevents the determination of the artefact quantity or, in some cases, even their presence.

Almost 70% of stone artefacts were produced from chalcedony. Other frequently used raw materials were flint (11%) and jasper (9%). Due to the volcanic origin of the landscape several types of volcanic rocks were present (Figure 13).

It appears that the examined raw material was of local origin, possibly excluding obsidian. Two main raw material sources were identified in Zone I. The first one was the rocky areas of puna grasslands, where nodules were collected directly from the surface. However, due to the high temperature amplitudes and heavy erosion, this raw material was described as having rather poor quality. The second source was the *quebradas* in which, especially after the rainy season, flowing water exposes large amounts of good quality nodules. It should be emphasized that the research area requires further investigation in terms of raw material sources and origins.

Almost 80% of the surface material was classified as a debitage. The various tool forms (191) are the second largest group of artefacts. The most frequent are points and other bifacial forms in various stages of reduction. Cores and core preparation artefacts comprise almost 2% of assemblage (Figure 14).

Based on the initial results of the survey, the Crucero 3 site was selected for further investigation. In 2011, preliminary excavations of an 8 m² sample area were conducted. More than three weeks of fieldwork allowed to determine the state of preservation, the site's limits and the existing strata.

Crucero 3 is located on the northern slope of the Jucumarini valley at 3900 m a.m.s.l. The site is situated on the right side of the river and relatively close to the bottom of the slope (Figure 15).

The excavations were preceded by an extensive archaeological survey of the site and surrounding terrain. The area was divided into six sectors varying in size and corresponding to topographical features. From a total of almost 2,800 collected stone artefacts, over 170 were tools, including various types of points and scrapers. The majority of scrapers were found within sector 6, which was set on the river terrace.

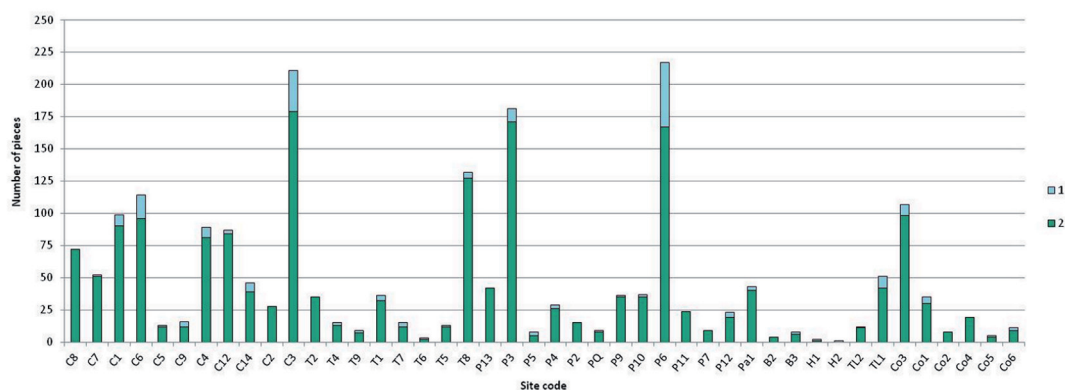


Figure 12. Number of artefacts per site; 1 – tools, 2 – other.

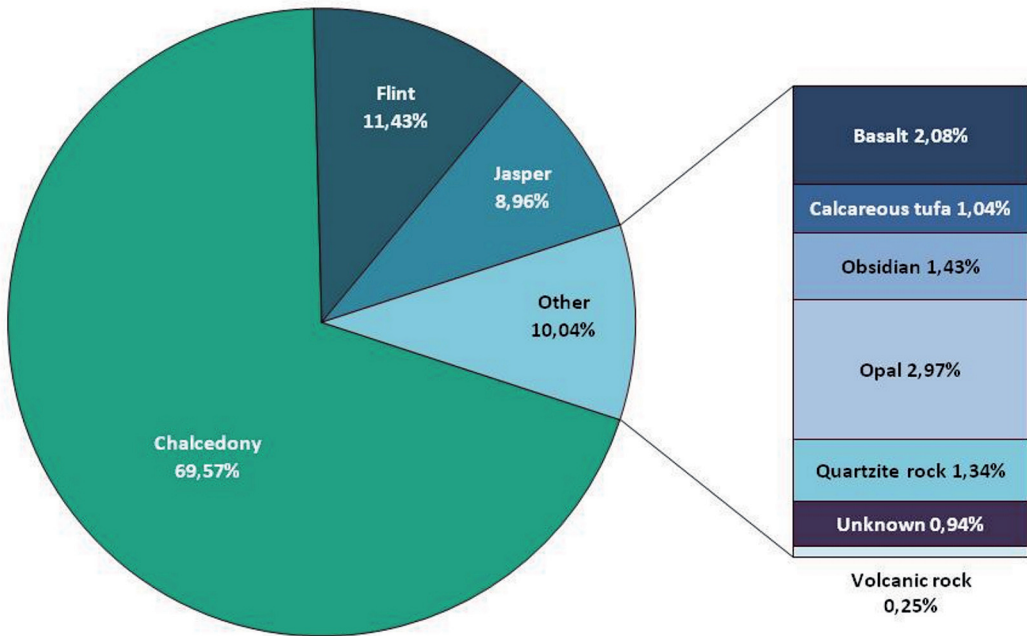


Figure 13. Frequency (%) of artefacts made from various kinds of raw material.

From the excavated 8 square meters, within 5 of them over 39,000 stone artefacts were registered. It allowed to determine the state of preservation of the site's strata. It should be emphasized that the vertical distribution of the lithic assemblage indicates continuous usage of the site.

The large variety of the tools strongly corresponds with the vertical position of the artefacts. More than 80% of the tools were bifacial forms including almost 60% of points in all the reduction stages. Over 90% percent of the lithic assemblage was the chips, which indicates that the biface production process was taking place at the site.

The majority of the stone artefacts were made of chalcedony. However, flint and jasper were also in use, as well as volcanic rocks.

Apart from the lithic assemblage, a large amount of animal bone fragments was registered. Even at the stage of excavation, cut marks and intentional breakage could be identified. Currently the osteological material is being analysed in terms of archaeozoological data and butchery marks.

Additionally, many other types of artefacts were recorded such as bone and antler tools and different types of beads, both finished and in the production stage. Moreover, one piece of red mineral dye was registered, similar to the ones used for cave paintings.

However, the most significant discovery was 5 human burials found in the bottom layers of the excavated area. Two of the skeletons were complete and in an excellent state of preservation. The burials of human 2 and human 3 were covered with a possible stone structure (Figure 16).

It should be noted that the research carried out in the high-mountain zone of the Tambo basin also enabled us to develop the state of knowledge of the early-colonial mining and metallurgical industry in the region. In the course of the conducted surveys, 4 ruins of colonial architectural complexes were identified and verified with historical sources. They are probably the remains of the seventeenth century warehouses and water mills used for grinding stone ore containing gold and copper (Figure 17).

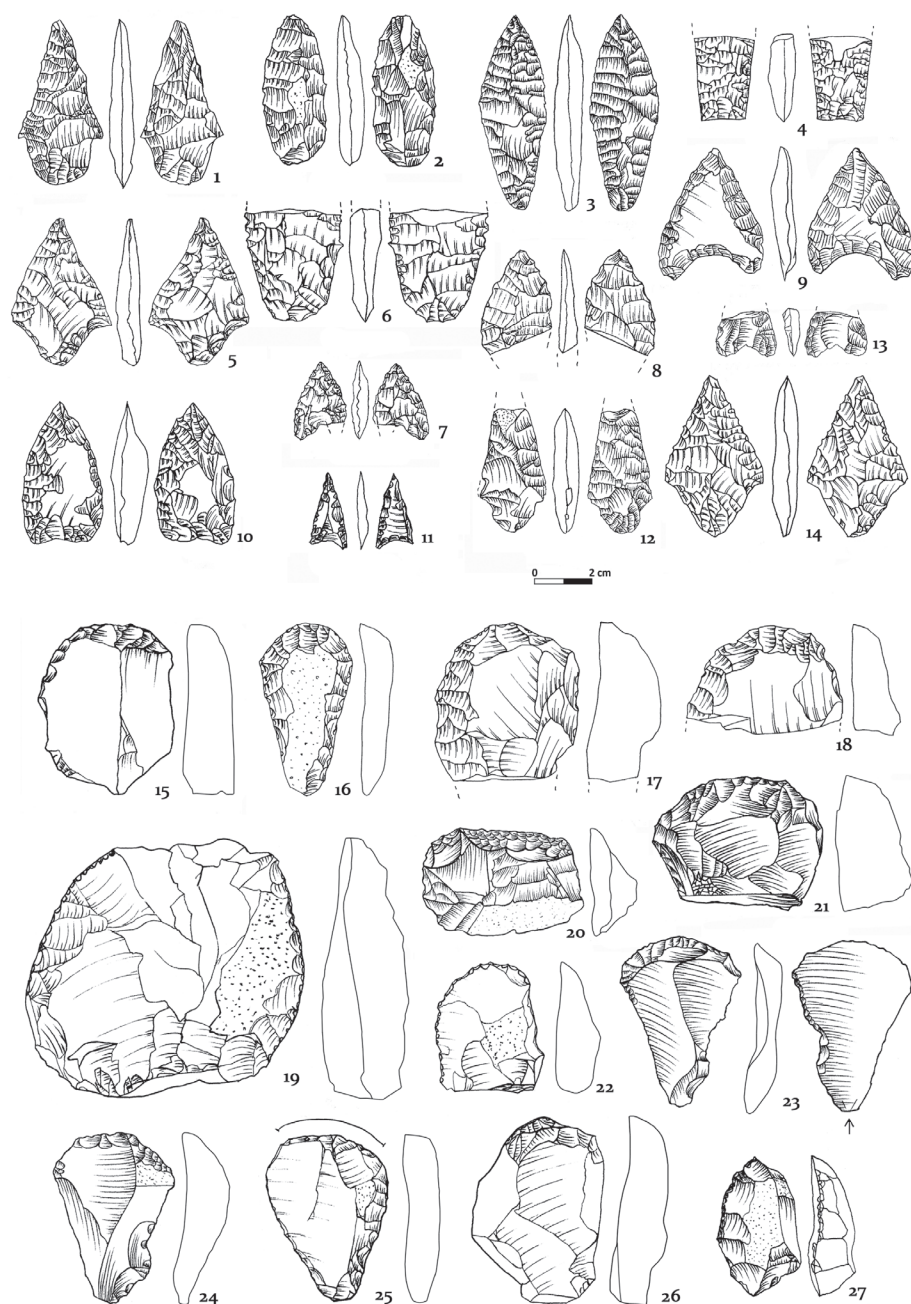


Figure 14. Lithic tools from the archaeological sites in the Jucumarini-Crucero region: (1, 2) – Crucero 3; (3) – Crucero 4; (4) – Crucero 8; (5 - 7) – Crucero 12; (8, 9) – Pucara 6; (10, 11) – Tolapampa 7; (12) – Collantane 3; (13) – Collantane 1; (14) – Bertani 3; (15) – Crucero 1; (16 – 18) – Crucero 3; (19) – Crucero 4; (20, 21) – Crucero 6; (22) – Crucero 9; (23, 24) – Pucara 3; (25) – Pucara 6; (26) – Tolapampa 8; (27) – Collantane 1.



Figure 15. The Crucero River valley; Crucero 3 site.

During the survey carried out on the right riverbank, the archaeologists were also able to locate remains of a previously unknown ore mining site. It is probably connected with the Spanish seventeenth/ eighteenth century gold mine remains.

The middle section of the Tambo River basin (zone II)

Work in the middle section of the Tambo River and the lower parts of its tributaries was conducted gradually during all research seasons of the project. In the course of this investigation, 56 archaeological sites from different historical periods were recorded. They could be dated from the Preceramic period to the expansion of the Inca Tawantinsuyu Empire.

The sites are clustered only in the upper part of the middle section of the river, which is due to the fact that the remaining area, i.e. the lower part of the middle section of the Tambo River – starting from the areas below the Quenestaquillas village – is a desert. The lack of settlement clusters in this part of the valley, even near the watercourse, instead, is due to the fact that the river water is salty from saline water flow and geyser eruptions occurring in the Rio Tambo riverbed itself. Only further on does the river become freshwater again, due to the existence of several mountain tributaries. Hence, we deal in this case with three different river ecosystems; freshwater, saltwater and freshwater with a considerable admixture of salt.

During the research work in the middle section of the Tambo River, the accumulation of ash and pumice from three powerful volcanic eruptions were also recorded. The youngest of these layers is associated with the eruption of Huaynaputina in 1600 (Figure 18). The two older layers, instead, seem



Figure 16. Crucero 3 site; the burials of human 1 and human 2.

to be traces of the activity of the volcano Ubinas. The issue of their chronological order itself requires an additional study.

In the course of Project Tambo both test trenches and extensive excavation work were carried out on sites located within the Tambo River valley: Tambo Poroqueña, Candahua 1, Candahua 2, as well as on the architectural complex Yalaque 3, located in the left bank tributary area, and site Carrizal 1, which is located in the area of one of the right-bank tributaries of the Rio Tambo.

Tambo Poroqueña

The archaeological work in Tambo Poroqueña focused on the identification and documentation of the large architectural complex located on one of the elevations covered by mountain terraces (*andenes*) situated on the right bank of the Rio Tambo, slightly below its tributary called the Rio de Torata and near Torata village.

Within the complex there are two rings of walls made of cut stone. They encircle the portion of elevation which does not face the steep cliff of the river valley (Figure 19). On the north-west part of the hill, the ruins of relatively large buildings with walls made of cut stones with clay and saddle roof construction were found (Figure 20). Hence, we are dealing here with the type of construction used



Figure 17. Ruins of the Spanish mill for grinding stone ore containing gold and copper.

in this part of Peru both in the Late Transitional period, as well as during the Late Horizon (Szykulski 2005, 2010a, 2010b). Yet it should be emphasized that the location of these buildings itself does not have the spatial layout of the building referred to as *kancha*, attributed to the Incas, which consists of buildings around a central square faced by all doors and windows (Gasparini and Margolines 1980).

It is also puzzling that a relatively limited number of buildings – though significant in terms of size – occur in the area of the urban complex Tambo Poroqueña, which visibly contrasts with the number of registered sepulchral structures covering a major part of its area.

The excavations conducted on the site showed a large number of – unfortunately mainly robbed – collective tombs, located in all parts of the hill, in crevices deliberately adopted for this purpose or in small rock niches. Deliberately constructed small burial niches were also found within the walls surrounding the hill as well as within the walls of each terrace inside the complex.

The entrances to crevices and niches serving as burial places were sealed by stone walls, usually carefully covered with clay plaster. Then in the wall a small hole was made, probably through which bodies were placed there subsequently. It is also possible that they allowed the living to make offerings to the dead and to communicate with them (Figure 21).

Apart from this type of sepulchral construction there were also documented dome-shaped tombs made of cut stones and clay mortar and additionally carefully covered with clay plaster. Some of these buildings had two levels separated by slabs or structures of wooden rods and clay. Analyzing numerous remains of mummies left by grave robbers – *huaqueros* – it should be noted that these relatively small structures contained remains of one or possibly two individuals (Figure 22). Most constructions of this type were in clusters located within large rock niches occurring in the wall of the cliff descending towards the bottom of the valley.



Figure 18. Carrizal village. In the background pre-Columbian buildings covered by ashes coming from the eruption of the Huainaputina in 1600 AD.



Figure 19. Tambo Poroqueña site located in the middle section of the Tambo River valley.



Figure 20. Tambo Poroqueña site; pre-Columbian stone structures.



Figure 21. Tambo Poroqueña site; an entrance to a tomb located in rock crevice.

Moreover, within the entire complex, numerous oval shaft tombs were reported, usually cut in the ground or with walls lined with stones. They were located on terraces covering the entire hill and sealed by slabs. In the course of research conducted in Tambo Poroqueña an occasional occurrence of individual burial towers, the so-called *chullpas* made of cut stones and clay, was also noticed. Like other sepulchral structures in this area, they also manifest traces of devastation. It must be stressed that previous studies seem to indicate that this type of burial structure appeared in the southern end of Peru before the expansion of the Inca Empire (Szykulski 2005: 62).

The analysis of pottery found on the surface of the site, as well as of the single vessels found in individual sepulchral constructions, can be classified mostly as the *churajón* type and partly as the *estuquiña* type. Thus, this is the pottery associated with cultures that developed in southern parts of Peru in the Late Transitional period, i.e. before the Inca expansion. It is puzzling, however, that there is only an occasional presence of Inca pottery. Also on the site Cerro Elasco, located in the nearby valley of the Rio de Torata, Inca pottery seems to be merely intrusive.

This fact, however, does not exclude, but only puts a question mark to the function, often attributed to the site Tambo Poroqueña, of the Inca *tambo*, i.e. a regional centre of power. We should rather assume that we are dealing in this case with an architectural complex associated with the Late Transitional period and perhaps also used by the Incas. Yet the rather limited number of relatively large buildings to which a residential function could be attributed, as well as the disproportionately larger number of sepulchral structures, also puts a question mark to the function of this place as a settlement centre. It rather leads to the conclusion that this site could have served as a ritual centre and burial place.



Figure 22. Tambo Poroqueña site; a dome-shaped tomb.

Candahua 2

Archaeological works carried out on the site Candahua 2 covered an elevation located directly below Candahua village on the right bank of the Rio Tambo (Figure 23). In this place there were visible remains of stone structures as well as a significant amount of pottery material, which should be associated with the Late Transitional period and the Late Horizon. In the documentation of the Ministry of Culture of Peru the site is registered as a burial ground, while the local population describes it as a sanctuary.

The results of the excavations did not confirm the existence of a burial ground. Only two stone *chullpas* foundations located at the southern end elevation and containing Inca artifacts were recorded. At the same time, mighty stone walls were recorded at the site. These were more than 1.2 m wide, within which small buildings made of cut stone with clay and covered with clay plaster were situated (Figures 24 and 25). At the edge of the elevation, retaining wall remains were discovered. It should be added that two test trenches, situated on the nearby elevation Candahua 1, confirmed the presence of undetermined remains of architectural structures. Remains of retaining walls surrounding the top part of the elevation were also found.

In the course of the excavations on the Candahua 2 site, inside the buildings a large number of pottery, stone and metal artefacts were recorded. The pottery mostly belongs to the *Inca imperial* type, and thus comes from specialized workshops of the Cusco region or from major administrative centers of the empire (Pardo 1938, 1939; Rowe 1944; Meyers 1975). Inca pottery of the *Inca provincial* type, i.e. vessels made in the Inca style by the local population or in the region, was also found. At the same time, both on Candahua 2 and the nearby Candahua 1 sites, as well as in their vicinity, the presence of pottery in a local style linked with the Late Transitional period was recorded.



Figure 23. The middle section of the Tambo River; Candahua 2 site.



Figure 24. Candahua 2 site; stone wall.



Figure 25. Candahua 2 site; Inca stone buildings.

Intensive settlement in the area dating back to the Late Transitional period is also indicated by the existence of the relics of large settlement centers with characteristic buildings and cultural contexts related to this period.

The nearest of them, registered as Cacaahuara 1, was documented during the research in Project Tambo. It is located on the left bank of the valley, opposite Candahua 2, slightly above the canyon of the Cacaahuara stream (Figure 26).

The results of excavations on the site Candahua 2 suggest rather a residential or ceremonial purpose of structures discovered on the elevation. Perhaps we are dealing here with the remains of a local Inca centre of power, ruling the region. It is also possible that the name of this place (the sanctuary), passed on from generation to generation by the local Indian population, can actually determine its function during the reign of the Incas.³

Yalaque 3, Carrizal 1

The site Yalaque 3 is located between Quebrada Serqueserque and Quebrada Choupilaque watercourses on a steep, terraced elevation, on which high walls with semi-circular watchtowers were situated (Figure 27). On the terraces there still remain canals, tombs made of stone blocks and crevices of probable sepulchral function sealed by walls made of cut stones and clay. During the documentation work conducted on the site there were also located: two small, D-shaped sunken squares (Figure 28). Their sides and bottoms were paved with stone slabs. The form itself seems to be associated with ceremonial constructions of the Huari civilization.



Figure 26. The middle section of the Tambo River; buildings at the Cacaahuara site.

³ The detailed report on the excavations on the Candahua 1 and Candahua 2 sites, as well as on a survey conducted by the Project in this part of the valley of the Tambo River is currently under preparation.



Figure 27. Mountain terraces at the Yalaque 3 site.

The archaeological evidence occurring on the surface is represented by stone grain rubbers and querns, fragments of copper artefacts and pottery. In the case of the pottery, apart from materials commonly referred to as the *tricolor sur* and associated with the Late Transitional period, there were also single Huari pottery fragments. The structure of the entire architectural complex itself and the presence of the Huari pottery indicate that the origin of this centre may be linked with the Middle Horizon and is probably related to the expansion of the Huari empire to the south. Such an assumption is also supported by the presence of the D-shaped sunken squares, which are characteristic for other settlement centres of this civilization (Isbell and McEwan 1991; Williams and Isla 2002: 101).

Research conducted on the Yalaque 3 site, although only in its early stages, is of great importance for further studies on the expansion of the Huari civilization to the south of Peru. The current results indicate that a strongly fortified settlement site of the Huari civilization was found here, which was also used during the reign of the Incas. This sheds new light on the question of the relations of settlement centres of this civilization, clustered in the enclave covering the upper part of the Osmore-Moquegua basin – and therefore also the Cerro Baúl – with the native area of the Huari situated more to the north (Lumbreras *et al.* 1982; Watanabe 1984; Williams and Isla 2002).

The Carrizal 1 site, excavated during Project Tambo, is located on the elevation above Carrizal village and forms the left bank boundary of the valley stream Yalaque, which further flows into the Quebrada de Huairondo, which, in turn, flows into the Rio Tambo. The entire area is covered with a thick layer of white dust and volcanic ash originating from the giant eruption of Huainaputina in 1600 AD. On surface of the hill and nearby elevations there are visible remains of buildings whose walls are



Figure 28. Yalaque 3 site; Sunken D-shaped square.

made of cut stones joined with clay. Outlines of large, adjoined, rectangular squares are visible (Figure 18). Outlines of structures were also observed on adjacent sites Carrizal 2 – Carrizal 4.

On the surface of the Carrizal 1 site there was a large amount of pottery with characteristic decoration allowing it to be linked to the *Churajón* culture, which developed in the region in the Late Transitional period. In addition, the presence of material from the reign of the Incas was noticed. In the course of research on the top of the hill, fragments of anthropomorphic keros were also found (Szykulski 2013: 410). They are characteristic products of the Tiahuanaco civilization. During test trench work in one of buildings on this site, in its foundation, cut stones were discovered – a building material, the use of which has not been confirmed for the Late Transitional period.

Research carried out on the Yalaque 3 and Carrizal 1 sites seems to confirm on both of them the presence of relics of stone structures and sepulchral finds associated with the Middle Horizon (600 - 1000 AD) i.e. with the period of Tiahuanaco and Huari civilizations' expansions to the river valleys of southern Peru. The importance of the valley of Tambo for the Tiahuanaco civilization has also been documented by the results of research conducted in the lower section of the river (Szykulski 2013).

Lower section of the Tambo River (zone III)

Research in this area covered the lower section of the river valley together with its delta and the final sections of its tributaries, as well as the ocean coast adjacent to the mouth of the Tambo River zone along with the *lomas* i.e. fog oases that, besides the estuaries, are the main areas of pre-Columbian settlements in the region.

Just as in the case of the middle section of the Tambo River, the work was carried out successively during all research seasons of the Project. In the course of this research, 32 sites in total from different periods were recorded. Also included in this group were extensive multi-cultural sites whose surfaces – as in the case of the largest El Pino site – measure more than 3 hectares.

In the course of the archaeological work conducted in the coastal zone it was possible to document the damage caused by the periodic occurrence of the El Niño phenomenon.⁴ There were also shell middens registered and recorded. They are traces of the activities of hunter, gatherer and fishermen groups living in the area (Figure 29). In later periods these places were often used as burial grounds, mainly associated with the Chiribaya culture that developed in this area in the late transitional period.

It should be noted that amongst the numerous shell middens registered in the years 2008-2010 by Project Tambo, the majority of them underwent partial or total devastation in 2011 as a result of construction work linked with the extension of the road that connects Punta de Bombón with the port town Ilo in the Moquegua region. Thus, the documentation of the Project is the only one existing on sites associated with the presence of hunter, gatherer and fishermen groups in this part of the coast. Yet on the shell midden PdB2 (Punta de Bombón 2), near the peninsula Punta Jesús y Colotea, several fragments of vessels with characteristics of early (Formative) pottery were found, confirming settlement on certain sites of this kind by people already familiar with pottery.



Figure 29. Pacific coast; The shell midden near the peninsula Punta Jesús y Colotea.

⁴ The presence or absence of burial grounds from the respective periods provides the basis for determining the timing of this phenomenon.

An open question remains as to whether finds of this type should be considered a confirmation of pottery manufacturing or rather evidence of trade with the agricultural population living in river valleys of the region, like the Tambo River and Osmore-Moquegua valleys, where the appearance of pottery manufacturing seems to be earlier than in the coastal zone (Neira 1990; Szykulski 2005, 2010b).

For human settlement history in this region, particularly important was the research conducted in the river's delta on the multicultural site El Pino and adjacent to it from the north site La Pampilla, as well as excavations carried out on burial grounds El Toro 3 and El Toro 4 located at the confluence of the Quebrada de Huairondo with the Tambo River.

The El Pino and La Pampilla sites are located within the Banduría hills, on the left-bank end of the Tambo River delta, near its mouth into the Pacific Ocean (Figure 30). During the research work in this area remains of several phases of settlement were discovered. They contain materials related to the late Preceramic period, activities of the early agricultural *formativum* societies, the period of expansion of the Tiahuanaco/Tiawanaku civilization; they also confirm the development of political entities formed on the tradition of Tiahuanaco in the area. Materials related to the expansion of the Inca Empire and the beginning of the colonial period were also found there.

The majority of documented cultural contexts were of a sepulchral character. Due to extremely dry conditions in the region on the northern edge of the Atacama Desert, in many graves, apart from pottery and stone items, a large number of organic matter artefacts survived.

During the excavations in El Pino, in part defined as sector 7, a burial ground from the Formative period was discovered. Burial contexts occurring here show relatively little trace of devastation by human activity. Recorded damage is the result of denudation processes instead. The accumulation

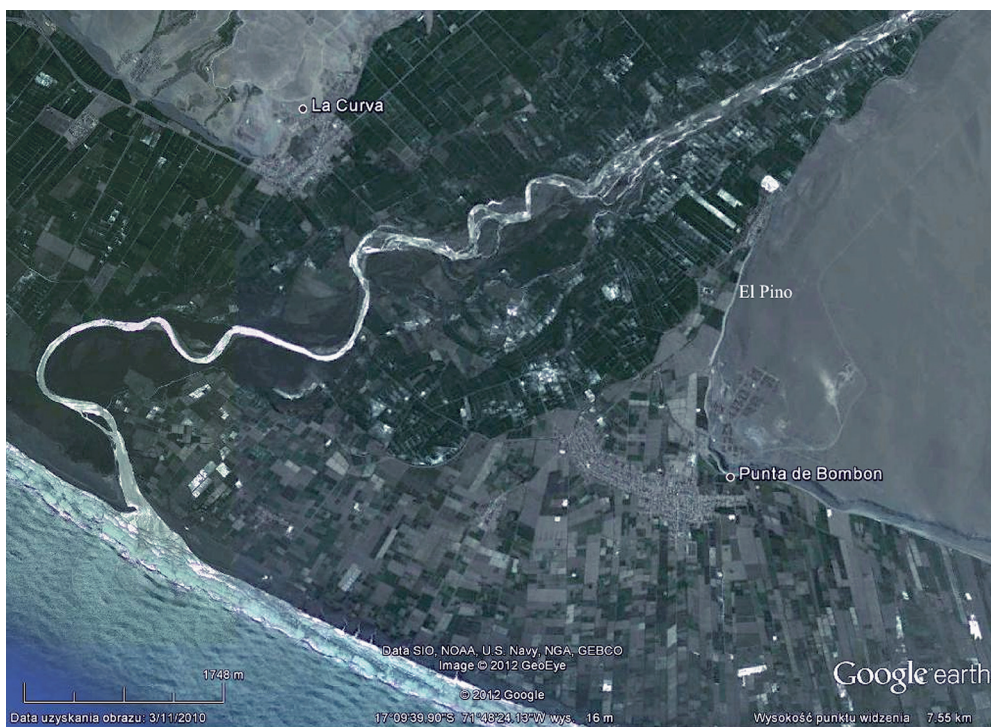


Figure 30. The Tambo River Delta; from: Google Earth.

resulting from them contains a large amount of osteological material, clay and stone spindle whorls, vessels and pottery fragments, as well as beads made of stone and shells, single copper items and their fragments.

Analysis of the burial contexts indicates that in most cases we are dealing with individual burials. The dead, positioned on their side with knees brought up against their chins, were wrapped in burial shrouds, *fardos funerarios*, that are preserved only in fragments (Figure 31). In some cases *fardo*'s outer layer appears to be made of net or cane mats (Figure 32).

A concentration of graves around a central burial is also observed. Its importance is emphasized by the fact that the deceased were buried together with a mace, consisting of a wooden shaft and a stone or copper discoidal head. These items seem to be an attribute of a chieftain's authority (Figure 33).⁵ Some nearby graves contained remains of individuals buried with small bows – grave goods only occasionally present in the cultural contexts of the Peruvian coast (cf. Figure 31). Other graves that seemed to belong to females contained stone or ceramic spindle whorls, pottery and single copper products. The spindle whorls, both in terms of production and decoration, have no counterparts in other archaeological contexts of the Peruvian southern extreme (Figure 34).

In the studied area two clusters of human skulls were also discovered. They might have played the role of offerings. It can be assumed that in this case we are dealing with the custom of the so-called head-trophy offerings. Finds of this kind seem to occur already in grave contexts of the Preceramic Chinchorro culture and are relatively common among the finds from the Nasca culture area.⁶



Figure 31. El Pino site; the burials from sector 7. Elements of weaponry can be observed (bow).

⁵ In the cemetery's fill an unfinished artefact of this type was also found.

⁶ The state of preservation of the skulls does not allow clear determination of whether they have intentional holes for head trophy hanging. It is expected that this problem will be solved in the course of specialist laboratory tests.



Figure 32. El Pino site; *fardo funerario* wrapped by a net.



Figure 33. El Pino site; an individual buried with a mace.



Figure 34. El Pino site (sector 7); stone and pottery artefacts found during the excavations.

During the excavations within the burial ground, single Nasca pottery fragments and very numerous products with characteristics of early pottery, i.e. Formative, were recorded. Only the latter were documented also within the context of intact graves (Figure 35). On vessels of definite Formative features, decoration in the form of engraved lines as well as anthropomorphic and zoomorphic 3D ornamentation occurred (cf. Figure 34). During the excavations a ceramic anthropomorphic figurine was also found, showing a strong resemblance to a find from the Sigwas River valley, which is currently held in the *Colegio Salesiano Don Bosco in Arequipa* (Haeberli 2001: 113).

A vast cemetery, discovered during the research in the sector number 7 of El Pino, containing very diverse and intact tomb inventories, confirm the existence of previously unknown communities from a formative period in the area. Pottery found during the investigations in El Pino, due to the form, ornamentation and composition, presents significant similarities to the La Ramada pot-type and products of the so-called Sigwas 3 culture, whose original area seems to be in the eponymous Sigwas Valley, located further to the North.

Both the La Ramada and Sigwas 3 seem to be dated to the Early Transitional Period and the Middle Horizon within the chronological system of Central Andes (Santos 1980; Haeberli 2001, 2009). Similar chronological position of El Pino materials was also confirmed by the results of radiocarbon dating.⁷



Figure 35. El Pino site, the tomb 40.

⁷ PTBand2/11, 667AD-826AD (probability 91.6%); PTBand3,4/11, 546AD-645AD (probability 95.4%); 583AD-670AD (probability 95.4%); PTBand6/11, 765AD-895AD (probability 84.0%). ElPinoS7H46, 406AD-544AD (probability 95.4%); ElPinoS7H76, 241AD-630AD (probability 95.4%); ElPinoS7H76 BIS 137AD-591-AD (probability 95.4%).

At the same time, it should be noted that the determination of the development phases (or rather stylistic phases) of the Sigwas culture was based on material from private and museum collections coming exclusively from robbery excavations. Yet during the determination of the phases Sigwas I, Sigwas II and Sigwas III, different criteria were adopted. A lack of common elements in the contexts of individual phases of development, as well as a long time-span covering nearly 1,500 years, suggest that in the case of Sigwas I - Sigwas III we are dealing with completely different cultural phenomena (archaeological cultures), probably of different provenance.

It should be noted that the cultural contexts recorded on the El Pino burial ground (sector 7) shed new light on the issue of the development of early agricultural societies in the area, and their relations with areas situated further to the north including the zone of the southern coast, where the Nasca culture developed.

The discovery of a burial ground from the Formative period in El Pino is also of great importance for research on the period preceding the appearance in this region of the high mountain Tiahuanaco civilization. At the same time, due to the fact that in the Sigwas valley itself, i.e. in the native area of this culture, the archaeological contexts that are present there underwent a large devastation, the discoveries in the Tambo River delta are of fundamental importance for further research, both on the La Ramada and Sigwas culture itself as well as on the issue of 'Neolithisation' of the southern end of the Peruvian coast.

In the course of further research work of Project Tambo, conducted on the La Pampilla site, the archaeologists located extensive terraces. Convex forms that seemed to cover relics of buildings were found on their surface. A very extensive and largely devastated cemetery was located below (Figure 36). The excavations conducted here revealed numerous shaft graves of a construction previously unknown in this region. The shafts' walls were lined with pebbles which are widely distributed in the region as remnants of glacial moraine.

Sepulchral structures from La Pampilla – of stone slabs, commonly used in this region – had covers made of wooden poles covered with reed mats. Both the construction and the grave goods clearly indicate that they belong to the Tiahuanaco civilization (Figure 37).

The dead were buried in a sitting position with their knees brought up against their chins (contracted burials). In one of the graves, the corpse was laid on a specially cut stone, surrounded by vessels decorated in the *Tiahuanaco Expansivo* style – distinctive for the phase Tiahuanaco V (Figure 38). Containers made from *Lagenaria* and fragments of textiles were also recorded there. On the surface of the burial ground, as well as within the aforementioned architectural structures, a large amount of Tiahuanaco pottery material was found, including fragments – only sporadically occurring outside of the Altiplano – of ceremonial vessels of this civilization, with 3D decoration of their rims in the form of jaguar or condor heads. It should be emphasized that pottery occurring on the site belongs both to perfectly made products which seem to originate from the Altiplano area, as well as to products that are probably of local origin.

Two other cemeteries containing Tiahuanaco civilization materials were discovered on an elevation surrounding the left-bank side of the Tambo River valley, a few hundred meters upstream from the site La Pampilla.

Due to the relatively short time of excavations on the La Pampilla site and the relatively small extent of the test trenches dug within the architectural structures located above the burial ground, we failed to determine whether we were dealing with dwellings or remains of a temple in this case. There is no doubt, however, that these structures are directly related to the burial ground below. The mere presence of the ceremonial vessels' fragments seems to indicate rather a religious purpose of these structures.

The discovery of remains of a Tiahuanaco settlement at the mouth of the Tambo River is undoubtedly of great importance for further research on the geographical range of its influence. Its importance stems not only from the fact that in this case the presence of the Tiahuanaco civilization



Figure 36. The burial ground of La Pampilla site.



Figure 37. La Pampilla site; interior of a Tiahuanaco tomb.

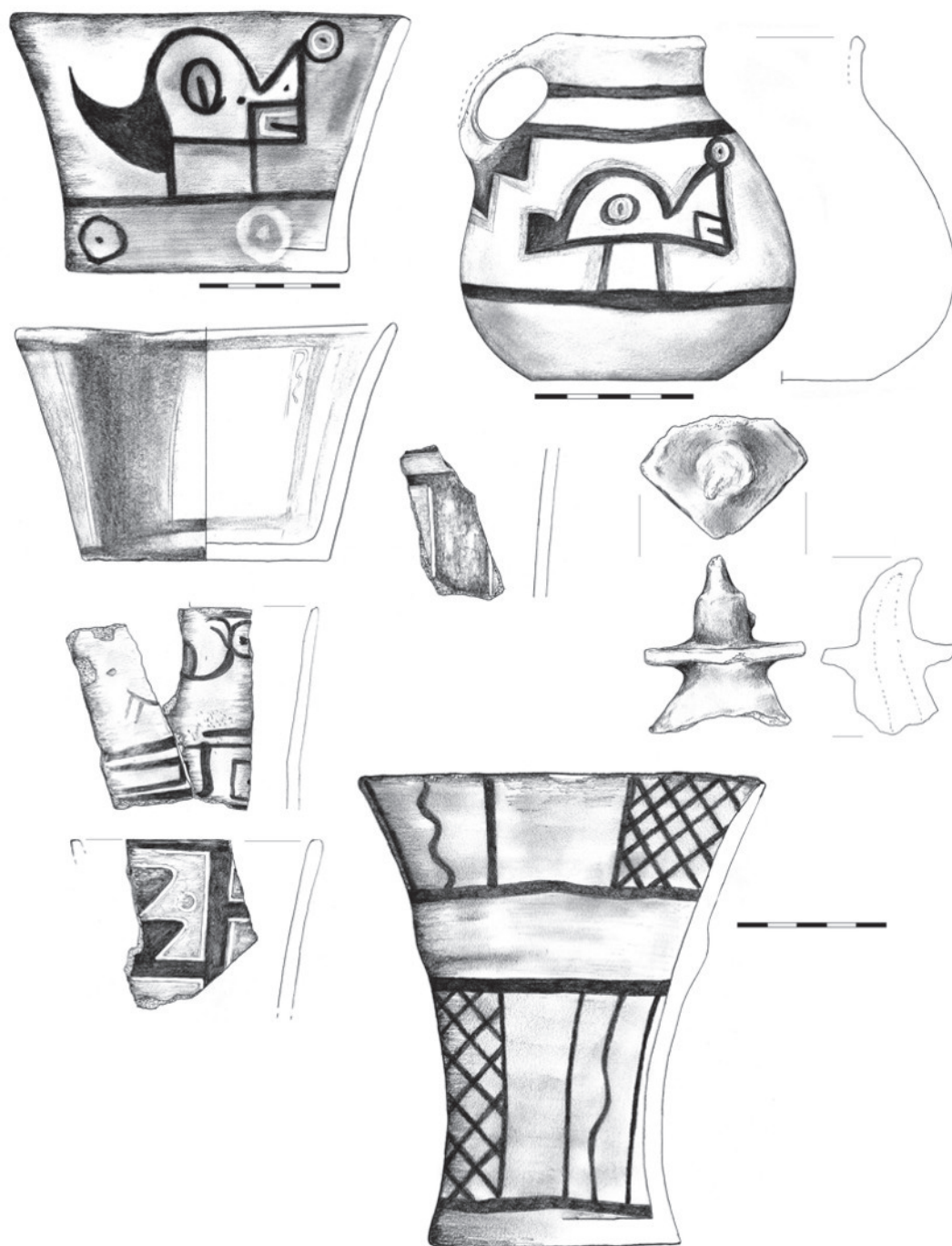


Figure 38. Tiahuanaco pottery from the La Pampilla site.

in the Tambo River valley was confirmed. More important, from a scientific point of view, is that the remains of the Tiahuanaco settlement were found directly on the ocean coast, and therefore beyond the Andes, in a region less than 100 m above sea level.

We should remember that, based on the results of research conducted by North American universities (Project Contisuyo), it was assumed that the part of the coastal zone where people from the Lake Titicaca area settled was the middle section of the Osmore-Moquegua River, located in the Moquegua region. It was believed that this was the only region where, apart from single finds, remains of settlements and burial grounds of this civilization also occur (Bawden 1990; Goldstein 1990, 1993; Pari 1998; Owen 2005). At the same time, all of them are located at a considerable distance from the coast, at an altitude of 1200 m a.m.s.l., i.e. within the Andes.

Therefore, the discoveries made by the archaeologists conducting Project Tambo shed new light not only on the issue of the Tiahuanaco civilization's zone of influence in the Pacific coast area, but also allow for a review of existing assumptions concerning settlement preferences and migrations of mountain communities along watercourses of the southern end of Peru.

During the excavations carried out in the region of the lower section of the Tambo River, remains associated with the late phase of the Middle Horizon, the Late Transitional period and the Late Horizon, i.e. the period from about 800 AD to the Spanish conquest (1532), were also discovered. Most of these materials are assigned to the poorly recognized Chiribaya culture. The results of radiocarbon dating performed on materials from tombs 18 and 26 in sector 4, indicate the time period between 1304 to 1396 AD, which corresponds with the period of the late Chiribaya culture⁸.

Graves had the form of vertical shafts dug in layers of volcanic tuff present in this region. The dead were buried in a sitting position with their knees brought up against their chins (contracted burials). Under desert conditions, burial shrouds, the so-called *fardos funerarios*, were well preserved (Figure 39). The materials found in the graves – apart from products of the Chiribaya culture – also indicate the far-reaching contacts of the inhabitants of this region with parts of the coast located far more to the north and to the south as well as with high mountain areas of the *Altiplano*. At the same time, dried potato tubers found in Chiribaya tombs confirm potato consumption in most of the southern parts of the Peruvian coast before Inca arrival in the area.

Further data regarding the Chiribaya culture and its links with other areas were also provided by excavations conducted in the Quebrada de Huairondo valley, on sites: El Toro 3 and El Toro 4 (Figure 40).

Excavations carried out here allowed the archaeologists to discover vast burial grounds containing circular shaft graves with edges reinforced by a stone ring covered by a slab. The shaft's opening was often surrounded by an additional, larger, stone ring, placed slightly above the slab of the grave pit. All discovered graves showed traces of devastation, but in some of them remaining grave goods were found. Apart from shrouds and utility vessels there were also vessels and their fragments in the Chiribaya style. Burial/offering deposits containing llamas as well as large quantities of wool were also discovered there. Heads of llamas found near and inside some devastated graves indicate that they were grave goods, too.

Based on analysis of the documented burial contexts and surface finds from the El Toro 3 and El Toro 4 sites, it appears that the sites should be associated with the Chiribaya culture, although the construction of the graves seems to be alien to this culture. It is extremely widespread, however, in areas where the Churajón culture developed, and whose remains are one of the primary determinants of the Late Transitional period in the mountains of southern part of the Arequipa region. It should be also remembered that the Quebrada de Huairondo and its tributaries are natural communication

⁸ Tomb 18, Poz-54198 (570 ± 30 BP), 1304-1365 AD; tomb 26, Poz-54199 (635 ± 25 BP), 1341-1396 AD. Probability 95,4%. OxCal v4.1.7.



Figure 39. El Pino site (sector 2); the Chiribaya culture burial (tomb 3).



Figure 40. The Quebrada de Huairondo valley; El Toro 3 and El Toro 4 sites.

routes between the eponymous pre-Columbian architectural complex Churajón and the Pacific coast. Besides, the use of this route also before the Late Transitional period is indicated by a fragment of Tasata pottery found on the El Toro 3 site, which is characteristic for the Early Ceramic (Formative) finds occurring in the Churajón region (Szykulski 2005, 2010b).

It should be noted that on both sites, large rectangular squares surrounded by walls made of massive boulders were present. Test trenches did not allow us to draw conclusions regarding their function. However, their large size and the effort required for their construction indicate a community purpose: temples, or assembly places?

CONCLUSIONS

Project Tambo was one of the pioneering research programmes for the southern part of the Central Andes, designing in the region a future direction and strategy for the development of the interdisciplinary study of the past of humans, their mobility and adaptability, analysed in the context of environmental changes. The procedures developed in the course of the Project will facilitate implementation of other similar research projects in the future, creating also an important element of study on issues of the development of prehistoric societies and global evolution of the environment, as well as human intervention in the process.

Yet the results of the field work conducted in the southern end of Peru as well as the laboratory work cast a new light on the history of the development of pre-Columbian societies living in these areas. They also questioned some of the seemingly irrefutable opinions on the importance of the Tambo River basin and its role in civilization processes as well as opinions on the mobility of human groups living here and their adaptability to different environmental conditions.

It should be emphasized that the documentation of these stages of Project Tambo delivered to the Peruvian party is of great importance for the country's protection of its cultural heritage. It also became the basis of the so-called *Resolución Viceministerial* No. 365-2011-VMPCIC-MC issued by the Ministry of Culture of the Republic of Peru, declaring 36 sites as National Monuments of Culture. Currently, there are ongoing proceedings aiming to declare other sites as National Monuments of Culture.

REFERENCES

BAWDEN, GARTH

1990 Tumulaca: un sitio de las fases Tiawanaku y Estuquina en el valle de Moquegua. *Gaceta Arqueológica Andina* V(18/19): 105–113.

ECHEVARRIA Y MORALES, F. J.

1600 *Memoria de la Santa Iglesia de Arequipa*. Unpublished manuscript. Archivo Municipal de Arequipa, Libro 8 Cabildos, Folio 312 V, Huaynaputina 1 de marzo de 1600.

GASPARINI, GRACIANO AND LUISE MARGOLIES

1980 *Inca Architecture*. Bloomington and London: Indiana University Press.

GOLDSTEIN, PAUL

1990 La ocupación Tiawanaku en Moquegua. *Gaceta Arqueológica Andina* V(18/19): 75–104.

1993 Tiawanaku temples and state expansion: A Tiawanaku sunken – court temple in Moquegua, Peru. *Latin American Antiquity* 4(1): 22–46.

HAEBERLI, JOERG

2001 Tiempo y tradición en Arequipa, Perú, y el surgimiento de la cronología del tema de la Deidad Central. In *Huari y Tiawanaku: modelos vs. evidencias*. *Boletín de Arqueología PUCP* 5 edited by P. Kaulicke,

- W. Isbell, pp. 89-137. Lima: Pontificia Universidad Católica de Lima.
- 2009 Tradiciones del Horizonte Temprano y del Período Intermedio Temprano en los valles de Sihuas, Vitor y Majes, Departamento de Arequipa, Perú. In *Arqueología del Área Centro Sur Andina. Actas del Simposio Internacional 30 de junio-2 de julio de 2005, Arequipa, Perú*. ANDES 7, edited by M.S. Ziolkowski, J. Jennings, L.A. Belan Franco and A. Drusini, pp. 205-227. Varsovia: Centro de Estudios Precolombinos-Universidad de Varsovia-Instituto Frances de Estudios Andinos.
- ISBELL, WILLIAM AND GORDON F. MCEWAN
- 1991 A history of Huari studies and introduction to current interpretations. In *Huari Administrative Structure. Prehistoric Architecture and State Government* edited by W.H. Isbell, G.F. McEwan, pp. 1-17. Washington, D.C.: Dumbarton Oaks.
- LUMBRERAS, LUIS, ELÍAS MUJICA AND RODOLFO VERA
- 1982 Cerro Baúl: un enclave Wari en territorio Tiwanaku. *Gaceta Arqueológica Andina* 1(2): 4-5.
- MEYERS, ALBERT
- 1975 Algunos problemas en la clasificación del estilo incáico. *Pumapunku* 8: 7-25.
- NEIRA AVENDAÑO, MÁXIMO
- 1990 Arequipa prehispánica. In *Historia General de Arequipa* edited by Neira Avendaño Máximo, Galdos Rodríguez Guillermo, Málaga Medina Alejandro, Quiroz Paz Soldan Eusebio, Carpio Muñoz Juan Guillermo, pp. 5-184. Arequipa: Fundación M.J. Buatamente de la Fuente.
- OWEN, BRUCE
- 2005 Distant Colonies and explosive collapse: The two stages of the Tiwanaku diaspora in the Osmore Drainage. *American Antiquity* 16(1): 45-80.
- PARDO, LUÍS A.
- 1938 Hacia una nueva clasificación de la cerámica Cuzqueña del antiguo Imperio de los Incas. *Revista del Instituto Arqueológico del Cusco* III: 4-5.
- 1939 Arte Peruano. Clasificación de la cerámica cuzqueña (época incaica). *Revista del Instituto Arqueológico del Cusco* IV: 6-7.
- PARI FLORES, RÓMULO
- 1998 Chen Chen: un sitio Tiwanaku. *Cronos, la revista de arqueología* 1: 69-74.
- PULGAR VIDAL, JAVIER
- 1946 *Geografía del Perú: las ocho regiones naturales del Perú*. Lima: Universo.
- ROWE, JOHN HOWLAND
- 1944 *An introduction to the archaeology of Cusco*. Papers of the Peabody Museum of American Archaeology vol. XXVII(2). Cambridge, MA: Harvard University.
- SANTOS RAMÍREZ RENÉ
- 1980 Cerámica Temprana. Estilo: "La Ramada". *Arqueos Perú*, año I, No. 1: 3-29.
- SZYKULSKI, JÓZEF
- 2005 *Pradzieje południowego Peru. Rozwój kulturowy Costa Extremo Sur*. Studia Archeologiczne XXXVIII. Wrocław: Wydawnictwo Uniwersytetu Wrocławskiego.
- 2010a *Starożytne Peru*. Wrocław: Wydawnictwo Uniwersytetu Wrocławskiego.
- 2010b *Prehistoria del Perú Sur (Costa Extremo Sur)*. Tambo 2 - Boletín de Arqueología. Arequipa: Universidad de Wrocław - Universidad Católica de Santa María.
- 2013 Tiahuanaco na południowych krańcach Peru. Jego znaczenie dla rozwoju cywilizacyjnego regionu. In *Instytucja „wczesnego państwa” w perspektywie wielości i różnorodności kultur*, edited by Jacek Banaszkiewicz, Kara Michał, Mamzer Henryk, pp. 397-422. Poznań: Ośrodek Badań Pradziejowych i Wczesnośredniowiecznych Instytutu Archeologii i Etnologii Polskiej Akademii Nauk w Poznaniu.
- THOURET, J. C., J. DAVILA, M. RIVERA, J.L. LE PENNEC, J.PH. EISSEN, A. GOURGAUD AND J. COTTEN
- 1997 The Largest explosive eruption (Vei 6) in historical times (1600 AD) in the Central Andes at

Huaynaputina Volcano, Southern Peru. *IX Congreso Peruano de Geología. Resúmenes Extendidos vol. Especial 1*: 505-508. Lima: Sociedad Geológica del Perú.

TROLL, CARL

1943 Die Stellung der Indianer-Hochkulturen im Landschaftsaufbau der tropischen Anden. *Zeitschrift der Gesellschaft für Erdkunde zu Berlin* 3-4: 98-128.

WATANABE, LUÍS

1984 Cerro Baúl: un santuario de filiación Wari en Moquegua. *Boletín de Lima* 32: 40-49.

WILLIAMS, PATRICK AND JOHNY ISLA

2002 Investigaciones arqueológicas en Cerro Baúl, un enclave Wari en el valle de Moquegua. *Gaceta Arqueológica Andina* 26: 87-120.