PSYCHOACTIVE SUBSTANCES IN THE ARCHAEOLOGY OF NORTHERN CHILE AND NW ARGENTINA

A COMPARATIVE REVIEW OF THE EVIDENCE

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ABSTRACT

A comparative analysis of the use of psychoactive plants in northern Chile, specifically San Pedro de Atacama and the Middle Loa and its tributaries (Caspana, Toconce, Lasana, Chiu-Chiu), with NW Argentina, as a probable diagnostic tool of shifting patterns of interaction. This work presents a review of the evidence for the ingestion of psychoactive plants in northern Chile and NW Argentina with particular emphasis on chronology, iconography and modes of ingestion. The iconographic and stylistic differences, as well as the divergence in chronology, suggest shifts in patterns of interaction between northern Chile and NW Argentina.

Key words: *Vilca, snuff, psychoactive plants, rapé.*

RESUMEN

Un análisis comparativo del uso de plantas sicoactivas en el norte de Chile, especialmente San Pedro de Atacama y Loa medio y sus tributarios (Caspana, Toconce, Lasana, Chiu-Chiu) en relación al noroeste argentino, se presenta como una posible herramienta de diagnóstico de cambios de los patrones de interacción entre ambas regiones. Este trabajo es una revisión de las evidencias de ingestión de plantas sicoactivas en el norte de Chile y noroeste argentino con énfasis en la cronología, iconografía y modos de ingestión. Las diferencias iconográficas y estilísticas, así como la divergencia cronológica, sugieren cambios en los patrones de interacción entre el norte de Chile y el noroeste argentino.

Palabras claves: *Vilca, inhalación, plantas sicoactivas, rapé.*

This work presents a comparative analysis of the evidence provided by the use of psychoactive plants in San Pedro de Atacama, the Middle Loa and its tributaries, and NW Argentina (Figure 1), as a probable diagnostic tool of shifting patterns of interaction. The criteria used include modes of ingestion, iconographic variables, and chronology. The modes of ingestion easily identified in an archaeological context are snuffing and smoking. The paraphernalia employed in these activities is specific to the task. However, the probable use of liquid preparations is not easily distinguishable, since its paraphernalia cannot be separated with any certainty from the wide array of vessels present in these areas.

Chemical analysis of archaeological snuffs and of smoking preparations in northern Chile and NW Argentina have detected the presence of several psychoactive alkaloids, most notably bufotenine (5-hydroxy-dimethyltryptamine). The finding of bufotenine in the Atacama snuff suggests that the plant source of this material was a species of the genus *Anadenanthera* (formerly *Piptadenia* Benth.; see Reis Altschul 1964; 1972). This is the only genus implicated in the snuffing complex that contains bufotenine (Torres *et al.* 1991).

The species of *Anadenanthera* present in the South Central Andes is *A. colubrina* var. *Cebil* (Figure 2). Small pouches containing *Anadenanthera* seeds have been found in several burials at the site of Solcor 3, San Pedro de Atacama. *Anadenanthera* seeds in association with smoking pipes have been found at the preceramic site of Inca Cueva in the Puna de Jujuy (Fernández Distel 1980), and at the late period site of Cusi-Cusi (after 950 A.D.?).

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Recibido: mayo 1998
Aceptado: septiembre 1999

Luis Alberto Lucas and Alicia Fernández Distel pers. com.), in the Puna de Jujuy. This is the tree known as *Vilca* in some areas of Peru and Bolivia, and it is known as *Cebil* in NW Argentina. *A. colubrina* is not present today in the San Pedro de Atacama area, or in other areas of northern Chile. A similar tree, referred to as *Vilca*, is present throughout northern Chile. Chemical analysis of the seeds of several specimens of this tree, probably *Acacia visco* Lorentz ex Griseb., have yielded negative results for alkaloids. This confusion has probably arisen from the fact that the foliage and the flowers of the different genera that compose the *Mimosoideae* are so similar. The pods of *A. colubrina* have a woody reticulated texture, and are considerably larger than those of *Acacia visco*, the so-called *Vilca* from northern Chile. The most obvious trait is that the pod of the *Acacia* opens along both sutures, while that of *A. colubrina* opens only along one suture. While *A. colubrina* is absent from northern Chile, it is a dominant tree in western Salta, Jujuy and Tucuman. Given the high incidence of snuffing paraphernalia in San Pedro de Atacama, the trade in *Cebil* seeds with NW Argentina must have been of considerable importance (see also Núñez 1994: 11).

Figura 1. Map of the South Central Andes showing locations of some of the sites mentioned in the text.

Figura 2. *Anadenanthera colubrina* var. *Cebil* seeds and pods, Salta prov., Argentina.

The connection of San Pedro de Atacama with the Puna de Jujuy, the Quebrada de Humahuaca and other areas of the Argentine northwest is documented by the presence of artifacts of a presumed Argentinean origin (Tarragó 1977). Notable among these are wood carvings (Berenguer 1984; González 1964: Figure 35) and a tie-dye tunic of a presumed Aguada (c. 400-900 A.D.) provenience. Llagostera (1995: 11, Figuras 1, 2-4) mentions the presence of 17 baskets with polychrome wool decoration that he attributes to the Aguada culture. On two occasions Le Paige (1964: 249; 1974: 69, 72) notes the presence of Aguada ceramics in San Pedro de Atacama. In this context, it should be noted that snuffing utensils have not been found in Aguada archaeological sites in NW Argentina, and ceramic pipes are not a frequent occurrence.

In the site of Tulor, Llagostera and co-workers have recuperated fragments of San Francisco (c. 600 B.C.- 300 A.D.) and Vaquerías pottery (200 B.C.-400 A.D.), two early polychrome ceramic styles of the Argentine northwest (Llagostera *et al.* 1984: Lám 7, Figuras 1, 2). Several San Francisco pottery fragments have been collected in the southern sector of the San Pedro de Atacama oasis (Agustín Llagostera y Francisco Tellez pers. com.). Several ceramic pipes very similar to San Francisco style pipes have also been found in San Pedro (see MChAP 1994: 54, foto 3; Pérez Gollán y Gordillo 1994: 123). Condorhuasi ceramics (c. 200 B.C.-600 A.D) have been found at the sites of Tulor Algarrobo and Tchapat chayna (Le Paige 1974: 72; Llagostera y Costa 1984: Figure 39). In addition, Isla Polychrome ceramics (c. 600-1050 A.D.) have been excavated at the sites of Quitar 5 and Quitar 6, in association with San Pedro Negro Pulido pottery (Pérez 1978: 518; Tarragó 1977: 51). The presence in San Pedro de Atacama of such a wide variety of northwest Argentine objects suggest the possibility of a complex interaction between these two areas. This long and complex interaction of San Pedro de Atacama with NW Argentina must have played an important role in the cultural development of both areas.

Following, the evidence for the ingestion of psychoactive plants will be discussed. First, the evidence from NW Argentina is presented, since this is the area with the oldest documentation for the use of psychoactive plants. Second, the evidence from San Pedro de Atacama is examined and compared with that from Argentina. Third, the situation in the Loa region is evaluated in reference to San Pedro de Atacama and NW Argentina. The Loa valley cultural context is distinct from the situation in San Pedro de Atacama, and also shows direct contact with the Argentine northwest.

NORTHWEST ARGENTINA

The culture area characterized as Northwest Argentina encompasses the mountainous area from the Bolivian border to San Juan province, and from the Chilean border to the Chaco. It occupies the present-day provinces of Jujuy, Salta, Tucumán, Catamarca, La Rioja and San Juan. Within this region the most important areas are the Quebrada de Humahuaca, the Puna de Jujuy, the Calchaquí Valley, with the ruins of the city of La Paya, and the Yocavil Valley. In the southern sector of NW Argentina snuffing paraphernalia is not as frequent, and it seems to mark the southern limits of the diffusion of this type of implement. This coincides with the southern limits of the distribution of *A. colubrina* (30°-32° S.).

The earliest evidence for the use of psychoactive plants in South America is provided by the materials found at the sites of Inca Cueva (IC c7), and Huachichocana (CH III), both located in the Puna de Jujuy, NW Argentina, at an altitude of 3860 m above sea level (Aguerre et al. 1973: 199, Figure 1). Inca Cueva (IC c7) is a small cave with no stratification and no associated human remains (Fernández Distel 1980: 55). The archaeological materials were deposited on top of a straw floor in the rear of the cave. Two smoking pipes (Figure 3) made of puma bone (*Felis concolor*) (Aguerre et al. 1973: 218, Figure 18; Fernández Distel 1980: 57, Figure 5; Aschero and Yacobaccio 1994), were found in association with knotted bags, gourds, spiral baskets, and *Anadenanthera* and *Prosopis* seeds (Fernández Distel 1980: 56). Chemical analysis of the pipe residue indicated the presence of tryptamine alkaloids (Fernández Distel 1980: 65, 75). Radiocarbon testing yielded dates of 4080±80 B.P. (2130 B.C.; T-1773; Aguerre et al. 1975: 213), and 4030±80 B.P. (2080 B.C.; Beta 64938; Aschero and Yacobaccio 1994).

Figura 3. Tubular pipes, feline bone, 13 cm, & 11.2 cm, Inca Cueva (IC c7), Jujuy, Argentina.

A nearby cave provided additional evidence for the smoking of tryptamine containing plants. The site of Huachichocana (CH III) is located in the Puna de Jujuy, NW Argentina (Fernández Distel 1980). The Huachichocana cave exhibits clear cultural stratification. The material related to the smoking of psychoactive plants was found in stratigraphic layer E2, dated by C14 to 3400±130 B.P. (ca. 1450 B.C.; GAK-6357; Fernández Distel 1980: 56). A male adolescent about 15 yrs old, was found in association with four stone pipes (Fernández Distel 1980: 58-60, figs 7-9). Two pipes were found near the mouth laying parallel to the body, the other two on each side of the body next to his lower legs very near to two turtle shells (*Geochelone chilensis*), two rattles with camelid kidney stone noisemakers, and two staffs (probable spear-throwers) decorated with turquoise inlays (Fernández Distel 1980: 56-57). Abundant traces of red pigment remain on the surface of two pipes (Fernández Distel 1980: 58). No *Anadenanthera* seeds were found, tests for alkaloids of the pipe residue

indicated the presence of tryptamine alkaloids (Fernández Distel 1980: 75, 79). As far as I know, nicotine has never been detected in archaeological material from NW Argentina or San Pedro de Atacama.

Subsequently, ceramic pipes appear in the formative levels of agricultural societies in the Argentine northwest. The earliest ceramic pipes correspond to the initial moments of the San Francisco complex. Angular pipes with a high bowl, biomorphic decoration, and supporting legs found at the site of Saladillo Redondo, near El Piquete, in the San Francisco river basin, have a radiocarbon date of 620 ± 80 B.C. This is the earliest ceramic period date in NW Argentina (Dougherty 1972: 84-85; Pérez Gollán and Gordillo 1994: 120). These are the earliest ceramic pipes known in the Central Andean area. This early group of angular pipes is found in several sites in the Quebrada del Toro, the Upper Calchaquí Valley, and the Puna. Their distribution to the Puna area and its eastern fringes was facilitated by the extensive basins of the Pilcomayo and Bermejo rivers (Pérez Gollán and Gordillo 1994: 120-123). Similar pipes have been found in San Pedro de Atacama but chemical analysis of the pipe residue has not detected the presence of any alkaloids (James C. Callaway pers. comm.). Ceramic pipes are widely distributed throughout NW Argentina in association with the polychrome pottery known as Vaquerías (200 B.C.-400 A.D.). Pipe fragments associated with Vaquerías ceramics, with radiocarbon dates of 230 A.D. and 250 A.D., have been excavated in Upper Loa river archaeological sites (Aldunate et al. 1986: 19-20).

Evidence for snuffing practices is lacking from the Período Formativo (c. 1000 B.C.-300 A.D.), and appears for the first time toward the very end of the Período de Integración (c. 300-900 A.D.). The Período de Integración is characterized by a pottery termed by Bennett (Bennett et al., 1948: 21, 39) the *Isla Polychrome* style. Pottery of this type has been found in northern Chile at San Pedro de Atacama (Pérez 1978: 518). *Isla Polychrome* style was found in association with the ceramic type "San Pedro Negro Pulido," a ceramic style contemporary with the Middle Horizon. Most of the extant snuff trays from northwestern Argentina probably belong in the Período de Desarrollos Regionales (c. 900-1538 A.D.), in contrast with San Pedro de Atacama where trays and tubes are a frequent occurrence after c. 200 A.D. A majority of the trays found in northwestern Argentina are of the type with appendages carved in the round. Climatic differences between the Atacama and NW Argentina might partially account for the paucity of finds of wooden snuffing implements in the eastern slopes of the Andes. However, this argument is contradicted by the relatively frequent presence of such instruments in this same geographical area after c. 900 A.D. The total absence of this type of artifacts during most of the Período de Integración suggest a later adoption of snuffing practices in NW Argentina (cf. Dougherty 1972: 86; Pérez Gollán y Gordillo 1994: 127).

The most frequent subjects depicted in the trays from Northwest Argentina are birds, humans with probable feline characteristics such as a fanged mouth, the double or alter-ego, and the decapitation theme. These themes are seen on other objects from Northwest Argentina. The iconography of the trays from Northwest Argentina has several features in common with those of the Loa river in northern Chile. Both areas share similar themes and motifs, notably: the ornament consisting of two vertical crescents united by a horizontal bar (compare Figure 5 and 11), humans playing the pan-pipes, and the decapitation theme. Rampant felines are present in the Pucará de Tilcara, and in trays from Pisagua, and Chiu-Chiu (Uhle 1913: Figure 14), northern Chile. The Heraldic Woman is also represented in both areas. In addition, this connection is seen in formal elements such as the shape of the receptacle area and its border, and carved figures bearing a similar relationship to each other and to the cavity frame (Figures 4-6).

Tiwanaku influence is totally absent in the trays from Northwest Argentina. Planiform extensions are present only at the site of Calilegua (Figure 4), but these lack Tiahuanaco style incisions. It should be mentioned that the attributed Calilegua provenience for these

Figura 4. Snuf tray, wood, 15 cm, Calilegua (?), Jujuy, Argentina. Museum of the American Indian, Heye Foundation, New York, collection no. 13/3657.

Figura 5. Snuf tray, wood, Doncellas, Jujuy, Argentina. Museo Etnográfico, Universidad Nacional, Buenos Aires (After Krapovickas 1958: Figuras 9, 10).

Figura 6. Snuff tray, wood, Tolombón 19 cm, Argentina.
Museum of the American Indian, Heye Foundation, New
York, collection no. 15/1498.

trays is uncertain; no supporting evidence is provided by the museum documentation. Snuff trays have been found in several sites showing evidence of Inca occupation such as Ciénaga Grande, Casabindo, and Rinconada. Although the evidence is not clear as to whether the trays were associated with the Inca material or not, it suggests the possibility of the use of snuff trays and tubes during this late period (after 1480 A.D.). This situation contrasts with that of northern Chile where snuffing paraphernalia is a rare occurrence during late pre-Hispanic times. The practice of snuffing and smoking *Cebil* seeds has survived in northwest Argentina up to the present-day. Among the Wichi (Mataco), a native group occupying the area of the Pilcomayo and Bermejo Rivers, an *Anadenanthera* powder is inhaled or smoked during shamanistic rituals (Califano 1975; Dasso 1985; Torres and Repke 1996).

SAN PEDRO DE ATACAMA

The archaeological zone of San Pedro de Atacama is located in the Atacama desert of northern Chile, at an altitude of 2450 m. San Pedro de Atacama, one of the largest oases in the Atacama, is composed of several small communities concentrated along the lower course of the San Pedro and Vilama rivers.

Approximately 60 ceramic smoking pipes (over 50% are fragments) belong to the collection of the archaeological museum in San Pedro de Atacama. These pipes have all been found in an early context (before 400 A.D.). Most are angular pipes with a high bowl and two-legged supports. The smoking material has not yet been determined. Analysis of several samples have yielded negative results for alkaloids. Evidence from neighboring areas in NW Argentina suggest the smoking of *Anadenanthera* seeds. There is a strong probability that several of the pipes found in San Pedro de Atacama originated in NW Argentina. The pipes with biomorphic decoration have many features in common with pipes of the San Francisco complex (ca. 650 B.C.-300 A.D.) and other formative ceramic styles

of the Argentine northwest (Pérez Gollán and Gordilo 1994: 122-123). According to Tarragó (1980: 40) the majority of the San Pedro de Atacama pipes demonstrate notable similarities with those found at Campo Colorado, in the Calchaquí Valley (*ca.* 100 B.C. - 100 A.D.). Campo Colorado is contemporary with Phases II/III of the ceramic sequence proposed for San Pedro de Atacama by Berenguer et al. (1986: 40-43). In San Pedro de Atacama pipes gradually disappeared during Phase III (*ca.* 100-400 A.D.) as snuff trays became more common (after 200 A.D.). Only five pipes are known to have been directly associated with the snuffing equipment. This contrasts with NW Argentina where pipes continued as the preferred modality for the administration of psychoactive plants.

The San Pedro de Atacama archaeological remains are characterized by the highest concentration of snuffing implements in Precolumbian America. The most common type of snuffing kit consists of a wool textile bag containing a rectangular wooden snuff tray, a bone or wood snuffing tube, a small spoon or spatula, and one or two leather pouches containing the snuff powder (Figure 7). Approximately 612 snuffing kits from San Pedro de Atacama are recorded in the literature (Latcham 1938: 131; Le Paige 1964: 61; Le Paige 1965: 23; Núñez 1963: 149; Llagostera et al. 1988:65). Forty two of the approximately 50 sites excavated in the area have yielded these kits. The cultural development of this area has been divided into eight phases, based on a seriation of ceramic types (Berenguer et al. 1986; Tarragó 1968). Most snuffing kits are associated with San Pedro Negra Pulida and San Pedro Negra Casi Pulida ceramics. These pottery types define Phase III (*ca.* 100-400 A.D.) and Phase IV (*ca.* 400-700 A.D.) respectively. The ceramic type San Pedro Roja Pulida is diagnostic of Phase II (*ca.* 300 B.C.-100 A.D.; Berenguer et al. 1986: 40-46). Only seven snuff trays are associated with this ceramic type, three of which exhibit clear Tiwanaku iconography. One of these trays (tumba 4229-30, Toconao Oriente) has been dated *ca.* 190

Figura 7. Snuffing kit (tray 16.1 cm, tube 21.5 cm, spoon 15.7 cm) Solcor 3 tomb 107, San Pedro de Atacama, Chile. Instituto de Investigaciones Arqueológicas y Museo, San Pedro de Atacama.

A.D. (UCTL-224). This is the earliest date related to a snuffing utensil, and it is also the earliest date associated with a Tiwanaku object in San Pedro de Atacama. The presence of snuff trays and tubes diminishes toward the latter half of Phase V (*ca.* 700-1000 A.D.). A Tiwanaku snuff tray with a camelid representation from the site of Solcor 3, tomb 5, dated by TL to *ca.* 920 $\pm$ 120 (UCTL 48; Berenguer et al. 1986: 34-35), represents the latest dating of a Tiwanaku object in San Pedro de Atacama. Tomb 3236, Quitor 9, has a radiocarbon date of 1050 A.D., and includes two snuff trays in association with Huruquilla and Dupont ceramics types, and a wooden kero (Núñez 1976: 107). These are the latest dates associated with snuffing in San Pedro de Atacama. During later periods there is virtually no evidence for snuffing in this area. Investigations conducted by Ana María Barón (1984) and María Antonieta Costa (Llagostera et al. 1988), have determined that the snuffing kits are generally found with adult males. The size and chronology of the sample indicates that approximately 20 to 22% of the adult male population was using psychoactive snuffs *ca.* 200-1000 A.D.

The iconography of the snuff trays from this area comprises a large variety of themes and motifs. Two broad categories of representational conventions can be discerned on these objects: those bearing Tiwanaku traits, and those carved with local motifs or regional variations on a pan-Andean theme. Most of the themes represented on San Pedro de Atacama snuff trays consist of principal figures with no subsidiary attendants. Sixteen basic themes, and their respective variables, are expressed in the snuff trays from San Pedro de Atacama. Seven of these depict iconographic clusters present in Tiwanaku and, to a limited extent in the Pucara culture (*ca.* 500 B.C.-200 A.D.) of the northern Lake Titicaca Basin. Among these the most frequently represented are the staff-bearing personages, and the profile genuflect figures and snuff tubes with anthropomorphic representations. Condor and camelid representations are notable because of their variety and amplitude of expression. As previously mentioned, Tiwanaku iconography is not present in NW Argentina. This fact should be emphasized given its importance in the snuffing paraphernalia from San Pedro de Atacama, where approximately 60 snuff trays and about 32 snuffing tubes of this type have been found (Figure 8).

The remaining nine themes represent local iconography or regional variations of widely distributed themes. Two of these, the alter-ego, and certain aspects of the long snouted Sacrificer (Figures 9, 10) persist late into the sequence (*ca.* 900-1100), and are among the few thematic units shared by the snuffing paraphernalia from both areas. Snuff trays and tubes gradually disappeared from the San Pedro de Atacama archaeological record *c.* 1100 A.D. This factor suggests that the practice of snuffing itself might have been discontinued. This is best seen at the site of Quitor 6 during its middle phase (*ca.* 400-800 A.D.), when approximately one out of every three individuals had snuffing paraphernalia in their burial (123 snuff trays). Excavations conducted by Maria Antonietta Costa in the latter phases of this cemetery (after 1200 A.D.) produced only one snuff tray and a tube. The presence of foreign objects also notably diminishes during the later phases. This gradual disappearance coincides with the appearance of similar snuffing kits in NW Argentina (after 900 A.D.), where it continues being used well into late Precolumbian times, and in some sites such as Casabindo, probably into the early colonial period.

THE MIDDLE LOA RIVER

Several sites with a high concentration of snuffing implements are located in the middle course of the Loa River and its tributaries. Approximately 188 snuff trays have been unearthed in the settlements of Caspana, Chiu-Chiu, Toconce, Chunchurí (Dupont), and Lasana, among others. Most snuff receptacles from this area have a rectangular cavity with one, two, or three appendages carved in the round (Figures 11-14). Trays with a flat panel and Tiahuanaco style linear incisions are absent, suggesting a post-Tiwanaku date for the snuffing paraphernalia from this area, contemporaneous with similar developments in NW Argentina.

Coyo Oriente, t. 4093-95

Coyo Oriente, t. 4008

Figura 8. Tiwanaku snuff trays, San Pedro de Atacama, Chile. Instituto de Investigaciones Arqueológicas y Museo, San Pedro de Atacama.

Figura 9. Snuff tray, wood, 16 cm, Solcor Nueva Población, San Pedro de Atacama, Chile. Instituto de Investigaciones Arqueológicas y Museo, San Pedro de Atacama.

Figura 10. Snuf tray, wood, 16 cm, San Pedro de Atacama, Chile. Museum of the American Indian, Heye Foundation, New York, collection no. 17/7552.

The site of Caspana, located about 100 kilometers to the north of San Pedro de Atacama, has the highest incidence of snuffing implements in the region, a total of seventy-eight snuff trays. Emil de Bruyne, an engineer with the nearby Chuquicamata copper mine, explored the cemetery known as "Los Abuelos". In this cemetery, adjacent to the pre-Hispanic settlement of Caspana, de Bruyne excavated forty-four tombs (Allende 1981: 5, 121). He unearthed forty-five snuff trays, thirty-six of which are now in the Museo Nacional de Historia Natural, Santiago.

Trays with three figures as ornamentation are rather frequent in the Caspana area. The most common type among these (Figure 11) represents two profile individuals seated in the flexed knees positions flanking a third front-facing figure seated in the same manner. The lateral beings exhibit a prominent snout and fangs, and are apparently humans wearing a feline mask. The central personage does not wear a mask, but holds a Pan's pipe, a motif also present on the snuff trays from Northwest Argentina.

The site of Chiu-Chiu is second in the frequency of snuff trays in the area of the middle Loa River. It is located in the confluence of the Loa and Salado Rivers. Approximately thirty-two trays have been found in this site, but in most cases ceramic and cultural associations are not known (Figure 12).

The site of Toconce lies about fifty kilometers to the east of Chiu-Chiu. Eighteen trays have been reported from this region. The Museum of the American Indian, Heye Foundation, New York, owns seven trays from caves along the Toconce River. Two of these are ornamented with representations of a human playing a panpipe (Figure 13). In northern Chile this motif is seen in the tray from Caspana, and another found by Spahni at the mouth of the Loa River. A third tray from Toconce is carved in the round, with a figure that holds an axe with the right hand and an ovoid object at chest level with the left (Figure 14 left). A human figure surmounted by a feline, the so-called double, is represented on several tubes from Toconce. This motif is also seen in trays and tubes from San Pedro de Atacama.

Figura 11. Snuff tray, wood, 18 cm, Caspana, Chile. Instituto de Investigaciones Arqueológicas y Museo, San Pedro de Atacama.

Figura 12. Snuff tray, wood, 14 cm, Chiu-Chiu, Chile. American Museum of Natural History, New York, collection no. 41.0.8754.

Figura 13. Snuf tray, wood, 17 cm, Toconce, Chile. Museum of the American Indian, Heye Foundation, New York, collection no. 14/3742.

Figura 14. Snuf tray, wood, 14.5 cm & 13 cm, Toconce (left), Lasana (right), Chile. Museum of the American Indian, Heye Foundation, New York, collection nos. 14/3741 (left), 15/9969.

Several other sites in the middle Loa area have produced snuff trays. Among these is notable the site of Chunchurí where Uhle (1913: 454) excavated thirty trays. At this site, Lautaro Núñez (1964) found a snuffing tube carved with the representation of an individual holding an axe and a trophy head. Núñez (1976: 79) obtained from this site a radiocarbon date of 1390 A.D. Other sites in the middle Loa area from which trays have been reported are Lasana, Paniri and Turi, but the information is negligible.

The presence of snuffing paraphernalia in these sites seems to postdate those from San Pedro de Atacama, and to be contemporary with those from NW Argentina. Work by Victoria Castro, Carlos Aldunate, and José Berenguer (Aldunate et al. 1986) suggest a relatively late date for these developments (after 900 A.D.). Formal and iconographic similarities between the snuff trays and tubes from the Middle Loa and northwest Argentina suggest some degree of interaction between these two areas. The evidence indicates a shift in the interaction with NW Argentina from San Pedro de Atacama to the Loa region *ca.* 900-1000 A.D. These similarities between the Loa and NW Argentina, contrast with the situation in San Pedro de Atacama where the interchange of iconographic elements was not so direct. If the trade in Cebil was basic to the practice of snuffing in San Pedro de Atacama, and connections with NW Argentina are evident in the San Pedro de Atacama archaeological record, the interchange does not seem to have included complex iconographic elements. This is further supported by difference in modes of ingestion as seen in the emphasis in snuffing in San Pedro de Atacama and the preference for smoking in the Argentine northwest. The complete absence of Tiwanaku elements in the adjacent areas of NW Argentina is notable when compared to its relative frequency in San Pedro de Atacama. The lack of Tiwanaku elements in the Loa region also suggests a low level of ideological interaction between the Loa and San Pedro de Atacama from *ca.* 400-900 A.D.

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