NOTES ON THE ORGANIC CLASSIFICATION OF THE PRE-HISPANIC MAYAN WHISTLES AND CONTEMPORARIES OF GUATEMALA

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0, Introduction

The main objective of this study is to give birth to some criteria about the organological classification of Mayan whistles used and made in Guatemala from pre-Hispanic times to the present.

Our object of study is a point of interest for disciplines such as History, Archaeology, Ceramics, Musicology, etc. However, on this occasion we refer to whistles only with respect to their acoustic and timbral qualities.

The present study is part of a more exhaustive research, what is now presented are partial results of this research. The pieces analyzed in this study belong to the Museo Popol Vuh do la Ciudad de Guatemala, as well as to private collections, whose owners we greatly appreciate for allowing us to have access to them.

1, Organological Classification Systems

During the history of his cultural development, man has been concerned, within his concerns, with the classification of musical instruments in relation to the materials with which they are made, as well as properly with respect to their sound qualities. Proof of

The references of the pieces analyzed in the Popol-Vuh Museum are the following; Piv-143210045-0046-0039-0047-0050-0051- 000 9-005 8-0062-0066-0072-1425-1430-705-1031-1424-1033-711-723.

we have this with the Chinese and Hindu cultures, which worked on these aspects centuries before Christ.

Europeans began to carry out these tasks in real depth from the fourteenth and fifteenth centuries onwards, although there are antecedents that date back to the twelfth century. However, it is the studies carried out since the mid-nineteenth century that have laid the foundations for current organology. Among the most outstanding scholars of this discipline we can mention the following:

Victor Mahillon (Brussels); Gevaert Francois (Paris); Erich M. von Hornbostel and Kurt Sachs (Berlin), whose contributions are used, with their respective modifications, to the present; George Montandon; André Schaeffner (Paris); Kurt Reinhard (Munich); Jaime Pahissa (Spain); Mantle Hood (United States of America).

We consider this brief list as a reference to the most recognized schools within the studies of organology. There is a nascent body of this type of studies in Latin America. For their true scientific work, within this discipline, we can mention the following authors:

Carlos Vega (Argentina); Isabel Aretz (Venezuela), Helza Cameu (Brazil); Josafat R. Pineda, Fernando García, Alida Salazar and César Bolaños (Peru); Roberto Rivera (Mexico); Felipe Flores (Mexico); Carlos Coba (Ecuador); Rodrigo Salazar (Costa Rica); Alfonso Arrivillaga Cortés (Guatemala); Arturo Chamorro (Mexico).

So consider this list as a guide, as well as a sample, of how important and advanced these studies are on the continent.

For the classification of the documentary corpus of this work, we will use the tables proposed by Hornbostel Sachs, as well as the graphic system based on these tables and devised by Mantle Hood.

2. The Documentary Source and its Classification*

All the whistles analyzed on this occasion were pre-Hispanic and current pieces from the Republic of Guatemala (belonging to the Popol-Vuh Museum and private collections). These are elaborating

2 The authors' fundamental works are cited in the bibliography of this work.

With the desire that the reader understands the following classifications better, we then develop the following items: Aerophone, since air is the main engine to produce sound, True Breath, since the "vibrating air is limited by the Instrument itself". Of edge or flutes, “A stream of air in the form of a ribbon, collides against an edge." With insufflation channel, “a narrow slit, carries the current of de

clay and designed by hand and at other times in mold for the pre-Hispanic era. Many of the whistles made today have been built with the help of the lathe. His representations are especially anthropomorphic and zoomorphic, because of their different finishes and the places where the pieces were located, we can say that this utensil was quite widespread, besides being used interchangeably by the hegemonic and subordinate groups of society. The dates and origins of the pieces worked on this occasion were as follows:

Gulf of Honduras (900-1500 A.D.), Ixil Region (900-1500 A.D.), Cotzumalguapa [600-900 A.D.), Chimaltenango (600-900 A.D.), 14h Lake (000-1500 A.D.), Kaminal Juyu (900-1500 A.D.), Motagua Basin (600 – A.D. 900).

Ribbon-shaped air, against the sharp edge of a side cut", Internal channel" "the channel is on the inside of the tube". Isolated, it is not accompanied by other sound bodies. Vascular, the internal body resonance box is in the form of a scale. Without holes or with holes depending on the existence of these specifically for fingering. In games, there are several resonance bodies that participate in the sound production. External Channel, "the channel is located outside the flute wall." Open, as soon as the sound structure, tube, vessel or scale is open. Closed, when it has no hole for air to escape, independently, in the fingering holes. Caps, the sound body is completely closed. Without an insufflation channel"" The performer himself produces with his lips a stream of air in the form of a ribbon "Scale without a developed beak" "the body of the flute is not a tube but a glass". Longitudinal "the performer blows against the sharp edge of the upper opening of a tube."

Placement of the different items within the tables

aerophone
true blowing instrument
edge or flutes
without insufflattion channel
longitudinal
tilting without a developed peak
isolated in games
open
closed
no holes
with holes
with insufflation tape
external channel
isolated in games
tapadillo
swing

Within the contemporary whistles analyzed, our attention is focused on the towns of San Pablo Rabinal in the department of Baja Verapaz and San Cristóbal Totonicapán of the department of the same name. Unlike the first mentioned community, in this second one the characteristics of its pottery are not typical of the pre-Hispanic era.

However, both the pre-Hispanic and current ceramic elements have formed a new ceramic called transition and which includes the Totonicapán whistles that we are now studying.

The different whistles subjected to the organological classification were grouped according to their characteristics into the following groups.

1) Pre-Hispanic whistles.

a) Internal channel whistles, vascular, with and without holes; 421.221.41 and 42 H-S
b) Internal channel whistles, vascular, with and without holes, in sets; 421,222.41 and 42. H-S
c) External channel whistles, vascular, with and without holes; 421.211.41 and 42H-S
d) External channel whistles, vascular, no holes in play; 421,212.12 H-S
e) Whistles-flute, external channels, open, in games; 421,212.12 HS =
f) Whistle-flute, internal channels, plugs, in sets, without holes; 421,222.31 H-S
g) Whistle without insufflation channel, vascular, without developed beak; 421,131.33 H-S
h) Whistle sim insufflation channel, longitudinal, open; 421,111.12 H-S
i) Whistle without insufflation channel, longitudinal, closed; 421,111.22 H-S

internal channel
Isolated
in games
open
1/2 tapadillo
Tapadillo
no holes
with holes
vascular

2) Contemporary Whistles

a) External channel whistles, vascular, with and without holes; 421.211.41 and 42H-S
b) External channel whistles, vascular, in sets, with and without holes; 421.212.41 and 42 H-S 9

3) Organological Characteristics and Analysis

Of the whistles analyzed as a whole we can point out the following (highlighting by these characteristics the groups "a", “‘b”, "c", are indirect embouchure whistles, since they require a wall '4 to conduct the sound. Of course, we must exclude whistles without an insufflation channel from this classification, since these are considered to have a direct embouchure. The embouchures are sharp and usually these are presented as a support of the instrument itself. Most whistles have one wall longer than the other in their insufflation channel, usually being the wall that does not touch the ground. It was a common feature that the whistles presented the insufflation channels, as well as their slightly offset bevels (both to the left and to the right) in relation to their resonance chamber.

Many of the pre-Hispanic and current whistles showed that, when the mouth of the instrument was pierced, the clay displaced by this action remained on the continuous wall to the insufflation channel, on the inside of the resonance box. In this way the extended wall was reinforced and helped to function as a double bevel. In most cases the resonance chamber of the whistles was vascular in shape. The external channel whistles featured their edge embouchure or tuning fork. The whistles of the pre-Hispanic “'d" group had their resonance boxes, one superimposed on the other, but having a single insufflation channel in the upper chamber, By these characteristics this group is constituted with a special feature, in relation to the aforementioned characteristics, since these acoustic and timbral features had not been pointed out previously. The pre-Hispanic “e" group stands out because the resonance body of the instrument is a tube and not a scale. This one has a closed whistle at one end of the piece. And on one side there is the insufflation channel that feeds the body of the instrument. Due to these characteristics, this group is constituted, like the previous one, of acoustic and timbral elements not previously mentioned. The group ”f" of whistles-flute is another example of the great organological contributions made by the Mayans in their musical development. We meet again

with common mouthpiece tubes, on which several channels and bevels depend for their sound production. These tubes are capped or "tapadillos" and are suspended on a common base. Regarding the group "g", whistle without insufflation channel, as already mentioned, these are considered direct embouchure. Its air inlet cavity is at the top. The fingering holes have small elevations on their edges, which cause amplitude in the sound production. It is very likely that from this type of transverse embouchure whistles, the vertical flutes with the aforementioned embouchure will be derived later. The clearest example of this is the group of whistles "n“ " and "g".

As for the contemporary whistles, the groups "a and "b" coincided in their characteristics with the pre-Hispanic whistles of the same organological order.

4. Organological Similarities and Differences between Pre-Hispanic and Contemporary whistles

We have been able to observe through the previous discourse similarities between pre-Hispanic and contemporary whistles.

It's amazing. This makes us think that the knowledge and construction techniques regarding acoustics and timbre have been transmitted and preserved until today. The similarity manifests itself basically as follows.

Similarities

a) The internal external channel 0, the scale and the fingering holes (or the absence of these), isolated or in sets, are the common denominator of most of the whistles studied, regardless of the Era to which they belong. This is a characteristic of the most generalized group.
b) The double bevel feature, i.e. one wall longer than the other in the insufflation channels, was another element in common of most whistles, as well as a reinforcing wall for the longer wall towards the center of the resonance chamber, usually accompanied the formation of the double bevel.
c) The existence of insufflation channels or deflected bevels was another element in common.
d) As for the variability of sizes of the whistles, it turned out to be

very vast, always obtaining parallels in the sizes, for the two periods treated.
a) It is common for both the representation of whistles with zoomorphic and anthropomorphic motifs.

Differences

a) Fingering holes appear on pre-Hispanic whistles, placed opposite the mouth of the instrument, and almost always behind the representation of the whistle.
b) In some cases the digital holes of the pre-Hispanic whistles appear on the front of the piece (the representation), but the direction of the mouth is reversed, preserving the same position as the other whistles analyzed, acoustically speaking.
c) In contrast, the current whistles had their fingering holes on the face of the representations, and this time in common relation to the position of the mouth or bezel.
d) In some of the whistles analyzed coming from Rabinal, the insufflation channel had the mouth (bevel) in an inverted position to the outside side. This channel formed a straight line in relation to its fingering hole, coming to coincide, almost, we would say with what we know as a true, open-blown aerophone.
e) It is important to point out that a large number of the organo-Logical principles of the pre-Hispanic era disappear in the whistles of current manufacture, which shows us a decrease in the organological variety. Although it is true that many organological elements were merged, the great variety of acoustic and timbral characteristics mentioned above disappeared.

Sound Production

The common elements of sound production to be defined are the following.

a) The whistles suffer a variation almost always of 1/2 4 1/4 of tone.
   This happens while the instrument is being tempered (heated), due to the air currents caused by the performer
b) In the indirect embouchure whistles, the possibilities of making

lip and vocal suggestions is. minimum, unlike the direct embouchure whistles where the aforementioned characteristics can be highlighted in greater detail.

c) Many of the whistles studied accepted strong air shocks when executed. This involves obtaining harmonics in two and up to three octaves. Some whistles even in different shutter positions produced the same harmonics.

d) The larger the holes, the greater the chances of clogging. This brings with it the increase of tonal possibilities.

e) Although very subjectively I could only add, that the sounds emitted by these whistles were characterized by being very sweet. And I would venture to hypothesize that sometimes they are a reflection of the sounds produced by animals in the natural environment.

6. General Conclusions

Initially we will state that this type of studies are almost non-existent in the country and this type of companies related to the organological classification of musical instruments of the country it becomes necessary to launch them in order to be able to establish parameters of comparison with other similar instruments in the continent and the world.

As for the characteristics of their classification, it could only be added that many times it became necessary to readapt the organological tables, since the acoustic and timbral characteristics of the analyzed whistles were not contemplated by the Hornbostel-Sachs-Hood tables.

The most outstanding characteristics in terms of the differences and similarities of the material analyzed this time have already been treated in the course of this work. We can consider these as a contribution to the general conclusions.

Perhaps the most outstanding characteristic of organological analysis is the great variety of organological principles in the pre-Hispanic era, a phenomenon that does not happen with contemporary whistles. It is very likely that this decrease in organological principles was caused by the shock of the conquest. However, it is worth noting that the organological principles present in contemporary whistles had similarity with those of the pre-Hispanic era. This makes us assume that the techniques of making the whistles have been transmitted over time, many of these being preserved to the present day.

BIBLIOGRAPHY

Aretz, lsabel, 1967 Instrumentos Musicales de Venezuela. Cumaná: Universidad de Oriente.

Arrivillaga Cortés, A**. 1982 Catálogo Exposición de Instrumentos Musicales de la Tradición Popular de Guatemala**. Guatemala: Centro de Estudios Folklóricos, Universidad de San Carlos.

Cameú, Helza. **1977 Introdúcao ao Estado da Musica Indigena Brasileira**, Río de Janeiro: Conselho Federal de Cultura e Departamento de Asuntos Culturais.

Chamorro, Arturo, 1983 "'Instrumentos Musicales de las Fuentes Pictográficas del Mundo Purepecha"'. En La Sabiduría Popular Memorias de la Primera Mesa Redonda de Etnomusicología y Folklores. COOLMICH/COPSIFE, Zamora, Michoacán.

Coba, Carlos. **1981 instrumentos Musicales Populares Registrados en el Ecuador.** Tomo |, Otavalo: Editorial Gallo Capitán.

Flores, Felipe y Lorenza Flores. 1981 **organología aplicada a Instrumentos Musicales Prehispánicos**. Silbatos Mayas. México, D.F; Instituto Nacional de Antropología e Historia.

Hornboutel, Erich y Sachs Curt**. Sistematic der Musik Instrumente.** Tomo XLVI, Berlín, 1914.

Hood, Mantle, 1975 **The Ethnomusicologist**. Los Angeles University of California, Institute of Ethnomusicologist.

Instituto Nacional de Cultura. 1978 **mapa de los Instrumentos Musicales de Uso Popular en el Perú**, Lima: Oficina de Música y Danza, Instituto Nacional de Cultura.

Mahilión, Victor. 1912 **Catalogue Descriptf et Analytique du Musée Instrumental Du Conservatorie Royal de Musique de Bruxelas**. Tomo IV. Bruxelas

Montandon, Gevaert 1946, Citado por Carlos Vega (1946**) Los Instrumentos Musicales Aborigenes y Criollos de Argentina**. Buenos Aires: Ediciones Centurión.

Pahissa, Jaime 1959 **Los Grandes Problemas de la Música**. Buenos Aires: Editorial Ricordi Americana.

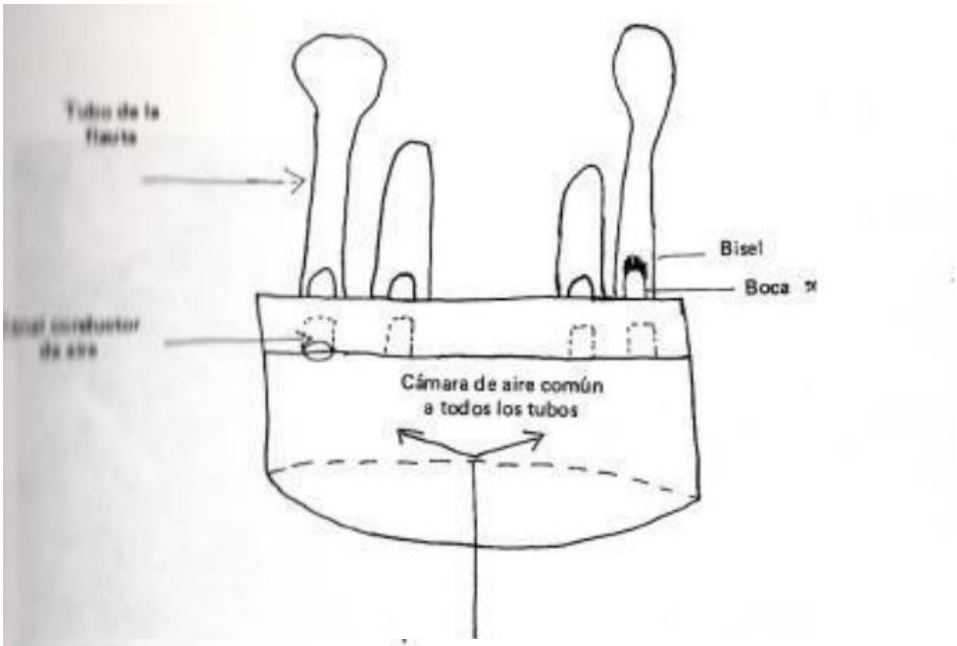
Rivera, Roberto. 1980 l**os Instrumentos Musicales Mayas.** México, D.F.: Instituto Nacional de Antropología e Historia.

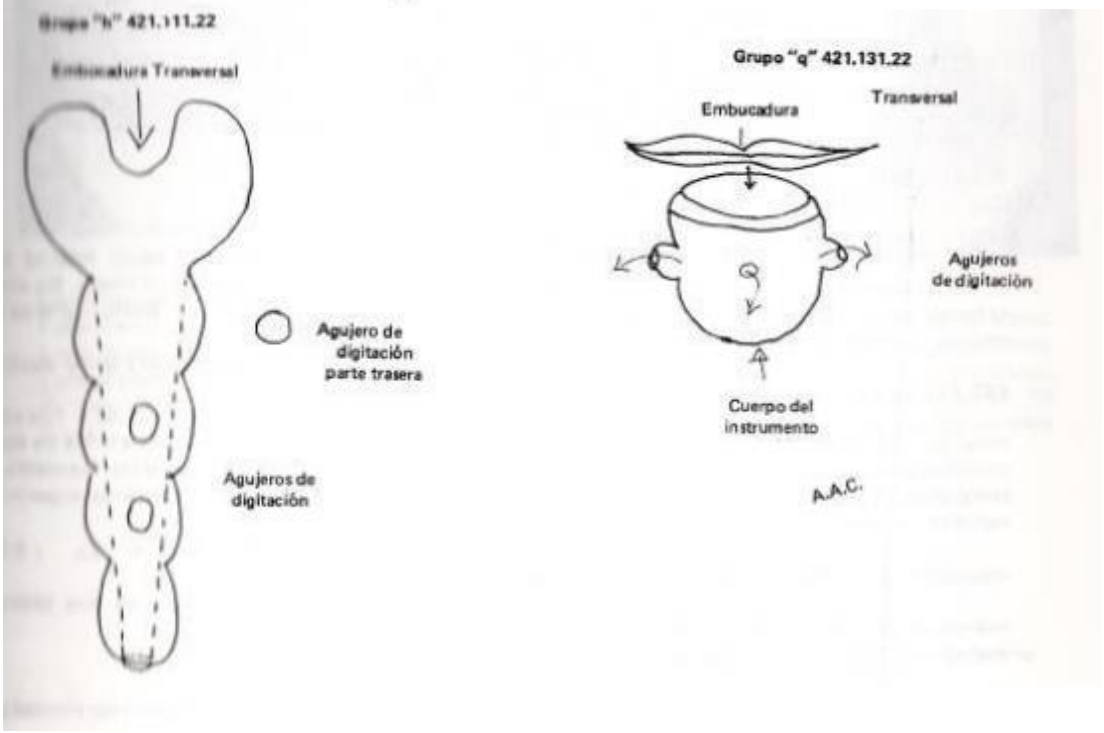
Salazar, Rodrigo. 1978 **La Música Tradicional de Barba**. San José, Costa Rica: Ministerio de Cultura Juventud y Deportes.

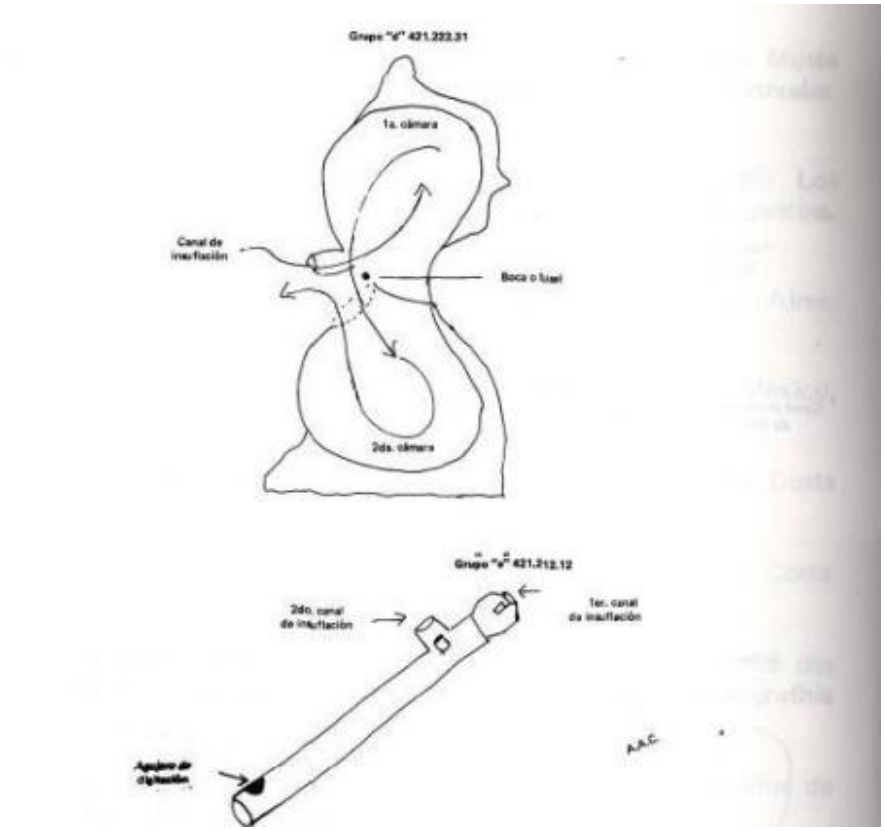
1982 **La Música Popular Afrolimonense** (Disco) 1982. San José, Costa Rica: Ministerio de la Juventud y Deportes.

Shaeffner André 1931 "Projet D' une Classification Nouvelle des Instruments de Musique" en **el Bulletin du Musée D'Ethnograthie du Trocadero**, No, 1, Parfs. .

Vega Carlos 1946 **Los Instrumentos Musicales Aborigenes y Criollos de Argentina,** Buenos Aires: Ediciones Centuri6n.


Tubo de la flauta
Bisel
Boca
Cámara de aire común a todos los tubos


Grupo "h" 421.111.22
Embocadura Transversal
Agujero de digitación parte trasera
Agujeros de digitación
Grupo "q" 421.131.22
Embucadura
Transversal
Agujeros de digitación
Cuerpo del instrumento
A.A.C.



Taking into account that the whistles have been classified with internal and external duct, it has become necessary to slightly vary the graphics proposed by Hood. In that sense we have adopted Ja barra outside the arches as an external duct

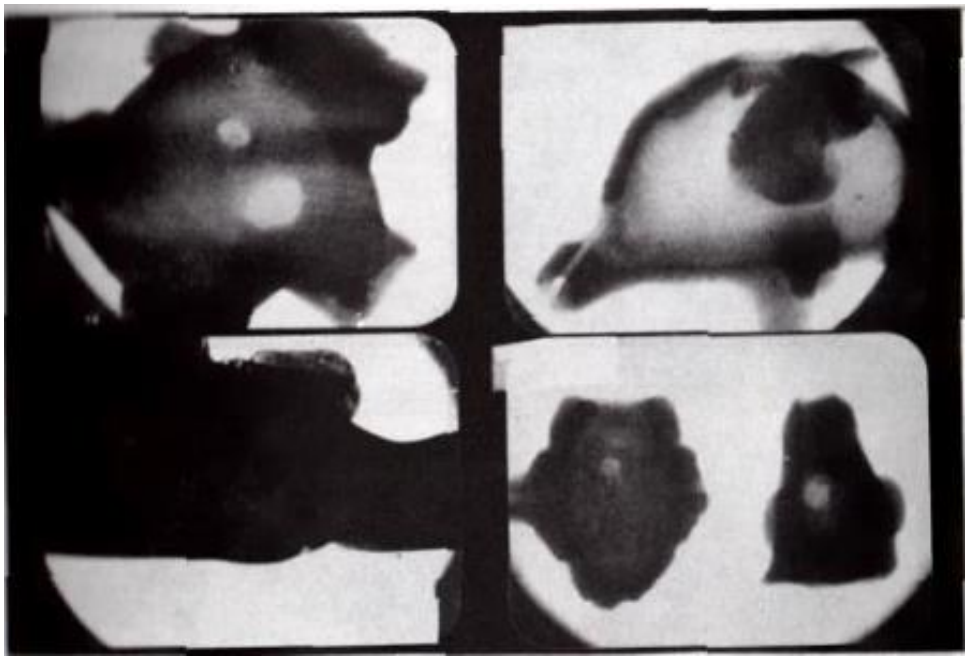
421,211.41 unlike the bar that goes through the arches considered as a duct

internal, So also all Jos whistles with closed external duct 421.211 their bars were modified by arcs, since these whistles have the characteristic of being vascular, The quadrant inside the circle, placed in the Lower Left position, means the external insufflation channel, while the upper quadrant

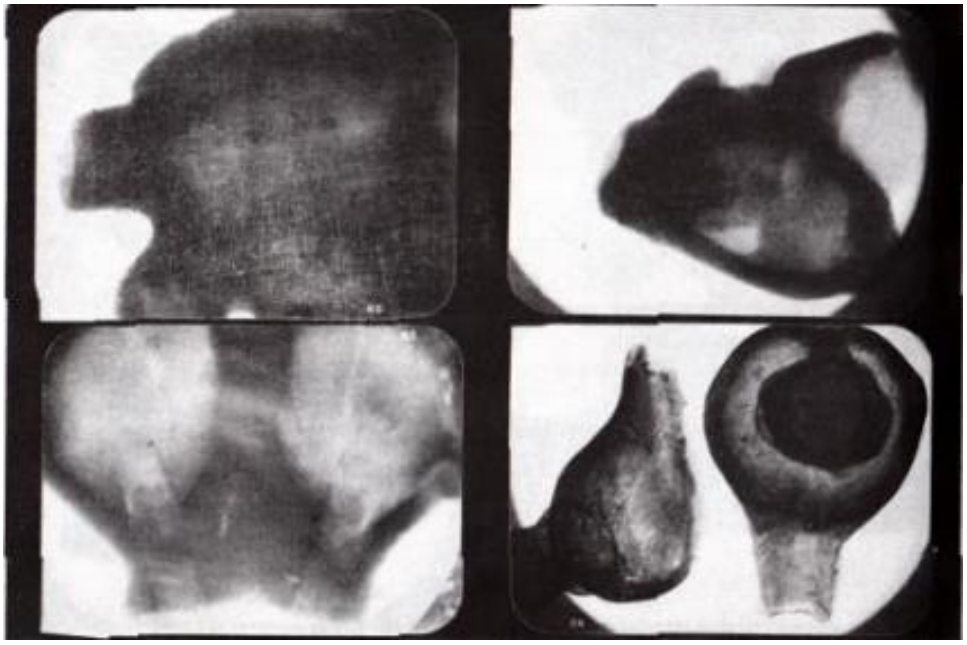
Izquierdo indicates that it is the performer who produces the ake string. In

As for their execution position, we have classified them as variable, since they all presented different execution possibilities

Finally, to the material with which they are built, we have represented it with a 2 according to what indicated by Mantie-Hood.



Upper left side, Pre-Hispanic Group "c" 421,211.42 Rad, No. 26 Cetfol Archive Upper right side Group "a" contemporary 421,211.42 Rad, No. 9 Cefol File. Lower left side Group "a" contemporary 421,211.42 Rad, 32 Cefol Archive, Lower right Side Group "a" pre-Hispanic: right side 421,221.41 Rad. No. 73 Cefol file. Left Side Group ""s" pre-Hispanic 421.131.22 Rad, No. 52 Fetal file.



Indications from the X-rays taken on some whistles. Upper left side, Group "c"" pre-Hispanic 421,211.42 Rad. No. 25 Cefol file, Upper right side, Pre-Hispanic Group "c" 421.211,41 Rad. No. 22 Cefol file. Lower Left Side Group "b" contemporary 421,212.42 Rad. No. 2 archive Cefol. Lower right Side Group "a" contemporary 421,211.42 Rad. No. 12 Cefal file.

Bird figure whistle, Guatemalan pre-Hispanic piece. There is no archaeological record. Photographs Jorge Estuardo de Molina Loza.

Pre-Hispanic Mayan whistles, made by hand and the details with mold. They come from the coast of Honduras, from the late classic period and belong to the collections of the Center for Folkloric Studies. They are assigned the organological classification 421.221.42 (group a). (Photographs: Jorge Estuardo Molina Loza).

Diagramas de Clasificación Organológica
Según Mantle - Hood.

"Grupo a"
Pre-hispánicos

421.221.42

421.221.41

"Grupo b"

421.222.41

"Grupo c"

421.211.42

"Grupo c"

421.211.41

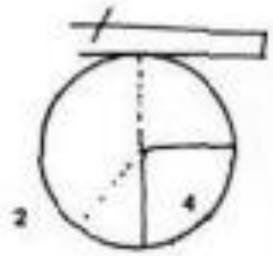
"Grupo d"

421.212.41

"Grupo e"

421.212.12

"Grupo f"

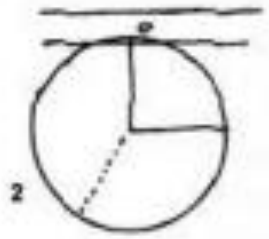


421.222.31

"Grupo g"

421.131.22

"Grupo h"

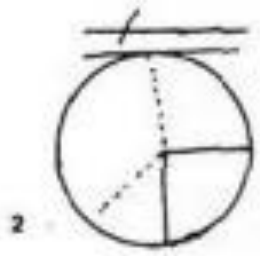


421,111.12

"Grupo i"

421.111.22

"Grupo j"



421.221.11