

BELLS

CASCABELES & TINTINNABULUM



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FOREWORD

About five months ago John Horne came to see me about doing an independent study course centering on his own collection of Precolumbian metal bells. He brought some samples from his collection and invited me to visit his home and inspect the rest of his pieces. This inspection prompted me to encourage him to produce some sort of publishable record of the collection, since even to my relatively untutored eye it was evident that it was important and of interest to scholars and collectors who are versed in such matters.

The resultant work is not so much a scholarly study as a personal presentation of his collection by John H. Horne. However, many readers will find John's observations worth while, springing as they do from many years of collecting and information gathering. And his excellent drawings, showing in many cases detail not visible in photographs, present stylistic information of interest to scholars and collectors as well as the general public.

I have enjoyed working with John and his wife Frances on this project, and have little doubt that he would welcome communication from other individuals with a serious interest in Precolumbian metal working.

Wes Jernigan

ACKNOWLEDGEMENTS

Dr. E. Wesley Jernigan, for his encouragement and much needed advice and help. As a professional anthropologist and writer, his input was invaluable.

Rodney Tidwell, for making available several important bells for study and analysis.

The Eastern Arizona College Museum Council for providing funds for the publication of this monograph.

My wife and friend, Frances Horne, for her enheartenment and worthy assistance in putting this study together. Her support goes back through twenty-five years of seeking to understand the wonderments of bell making in Latin America.

Thank you,

John H. Horne

PREFACE

I have been deeply interested in and have collected small bells for some twenty-five years. I have read everything I could find that related to "cascabeles" as they are called in Mexico. The Mexican word "cascabel" means small rattle or bell. A rattle snake is called a "serpiente de cascabeles" because of its rattles. I am particularly fascinated with the bells of the Tarascan and Mixteca that were cast in Pre-Hispanic times. Having lived a part of each of the above mentioned years in Mexico, I have had ample time to seek out bells in museums there and in other people's collections. I have made numerous sketches of bells displayed in the museums of Mexico. This paper describes and comments on my own collection of such bells.

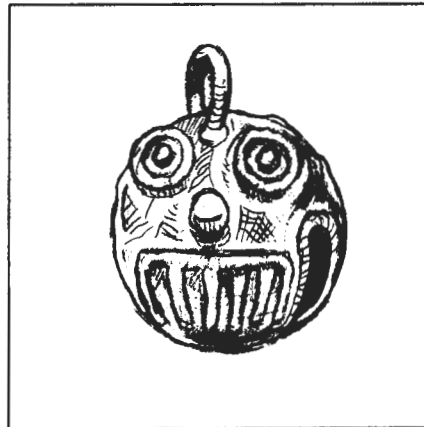
It is said there was never a "true" bronze age in Pre-Hispanic America, but there were certainly "pockets" of craftsmen who developed broad skills in the working of bronze, silver, and gold.

The working of metals in this hemisphere had its genesis in South America and gradually spread northward into Mesoamerica. From Mexico, quite a number of small bells found their way to the southwestern United States.

Included in these writings are some observations, facts, and illustrations, both sketches and photos, of bells I have seen.

Also, herein, is a brief history of bell making in the old world. Some of the similarities of the "tintinnabula", little bell of the Mediterranean area and the "cascabel", little bell of Latin America are readily apparent.

Dating various "metal cultures" in Central and South America is difficult, as different anthropologists attach different dates and chronology to the metallurgy of ancient America. I, as a layman, will not, in most instances, attempt such dating.



BRIEF HISTORY OF METAL WORKING IN LATIN AMERICA

There is agreement among almost all experts in the subject that metal working in the Americas had its beginning in Peru during the Mochica-Nazca era. The skills, techniques and types were transmitted to the north through Panama and Costa Rica. (See map following)

Metallurgy arrived in Mexico in the classic period or early in the Postclassic era. Vaillant credits the Toltecs with the earliest techniques of cold hammering copper. Later, a greater scope of skills was obtained from the south. Copper was cast into small bells, ornaments and even tools, using the *cire perdue* or lost wax process, as well as other innovations.

Bronze items displayed in the Regional Museum in Guadalajara include items from the states of Nayarit, Jalisco, Michoacan, Guerrero, Oaxaca, and Colima.

A plaque in the bronze section of the Regional Museum, Guadalajara, Mexico, where Pre-Hispanic bells and other items are displayed indicated that the art of working metals is relatively late in Mesoamerica. The established date of origin seems to be about 900 A.D., though there are indications that there may have been an earlier beginning in Western Mexico, about 650 A.D. Knowledge of metal working seems to have arrived from Central or South America where it had developed centuries before. The metals used were gold, silver, and copper. The techniques used for working metals were hammering, smelting, soldering, welding, repousse, gold plating, silver plating, and lost wax casting.

Ignacio Bernal, the great Mexican anthropologist and archaeologist in his book "Mexico Before Cortez" said, "Recently, I had an opportunity to examine some exceptional items from a new find in Uruapan, in the state of Michoacan, and came upon two techniques hitherto associated with Ecuador and Columbia, but not with Mexico. One was the use of *drawn wire* as opposed to *cast wire* or *false filigree*."

The greatest levels of skill among the Mexican metal smiths were attained by the Tarascans and Mixtecas.

According to S.K. Lothrop, fine work in metal crafts had reached astonishing heights in Peru, Ecuador, Columbia, Venezuela, Panama, Costa Rica and Mexico by the time the Spainards arrived.

In addition to bells, the Tarascan and Mixteca metal smiths created necklaces, bracelets, pectorals and brooches. They also made axes, celts, fish hooks, needles, awls, pincers and other useful things. Another item they created was the "Hacha de moneda," a small thin ax used as a medium of exchange in the markets.



FROM CODEX IN MUSEO REGIONAL de GUADALAJARA



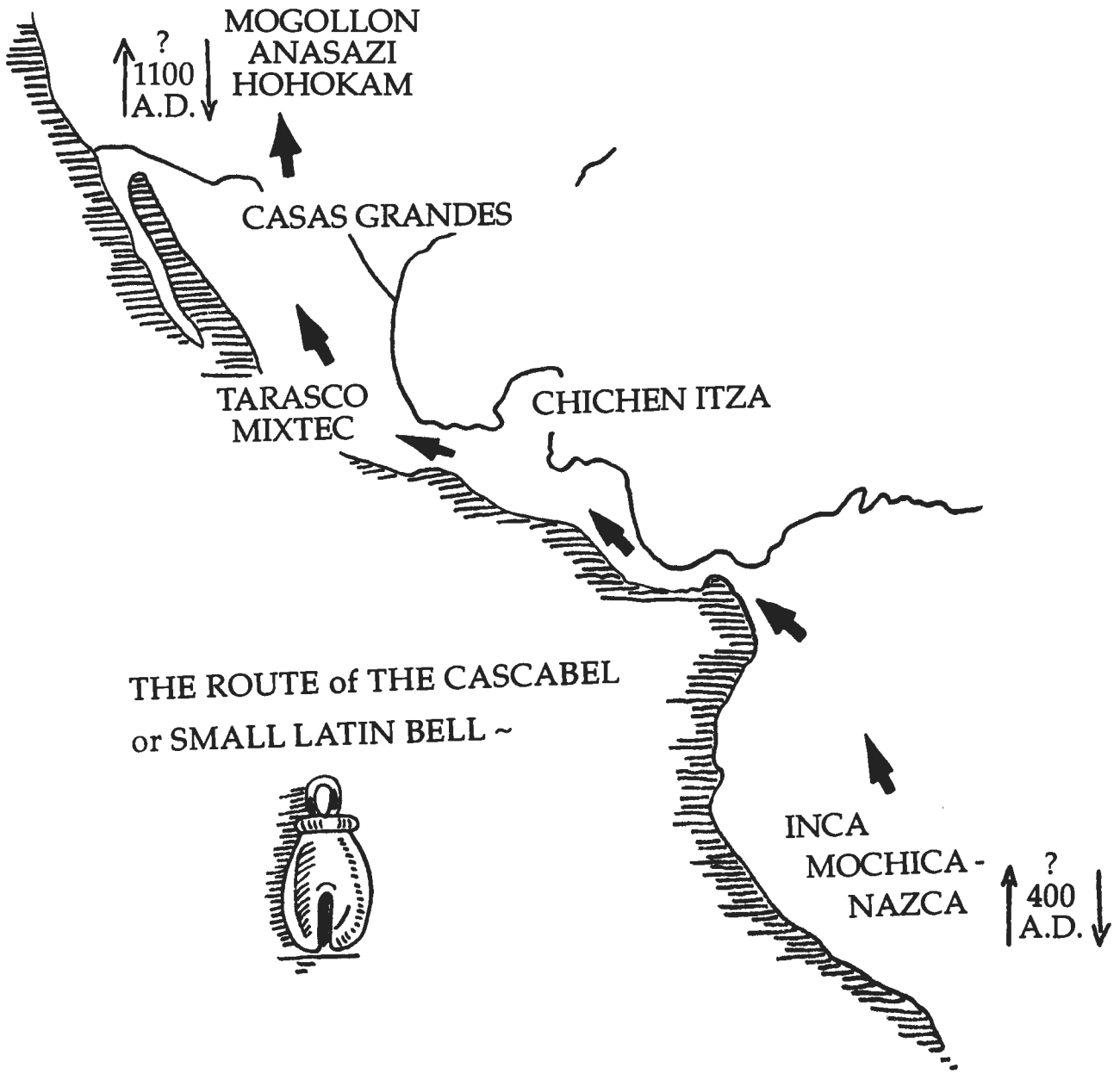
METAL WORKER - FROM SAHAGUN FLORENTINO CODEX



"BELLS --- GAVE SOUND TO THE DANCERS PRANCE~"
VICTOR W. VON HAGEN



COASTAL MERCHANT AND METAL WORKERS BARGAINING ~ SAHAGUN FLORENTINO CODEX ~



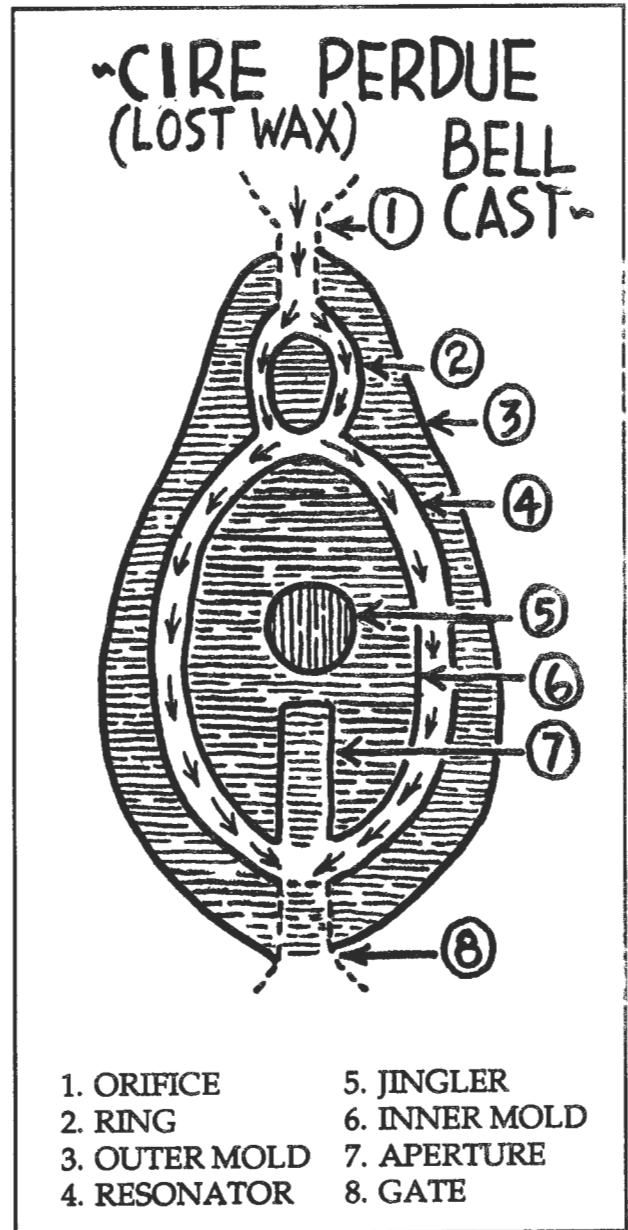
BELLS CAST BY THE CIRE-PERDUE PROCESS

In casting bells using the cire-perdue process the core or inner mold was made of a "soft" clay, sand and charcoal mixture, in which was buried a small jingler of rock or copper. This inner mold had to be made of a non-hardening material that could later be washed away or picked out to release the jingler.

The next step was to sculpt, over the inner mold, the true shape of the bell to be cast, using wax. The other mold of clay was then applied over the wax. Both molds were sprayed with charcoal powder to make it easier to eventually separate them from the bronze. The two molds were made rigid to each other by joining at the aperture of the wax bell shape. An orifice was made at the top of the bell and a gate made at the base of the outer mold.

The wax was then melted and released through the gate. The gate was then plugged and molten bronze poured in to replace the "lost wax."

After a cooling period, the outer mold was broken off and the inner (soft) mold washed or picked out, releasing the jingler. The bell was thus cast.



Note: Air vents of wax rods may have been used in casting large bells.

Ref. Fig. 637, Page 504

Casas Grandes, No. 9, Vol. 7



THE SCOPE OF PREHISPANIC METAL CRAFT

Miscellaneous items, both ornamental and useful, were turned out at an amazing skill level. There are some the functions of which are difficult to fathom, and might be simply "whim" creations. On this page, we show representative sketches of some of these bronze creations.

Both the Mixteca and Tarascans were capable of this diversity. Perhaps the Mixtecas showed a trifle more Imagination whereas the Tarascans seemed to show an inclination toward practicality.

- | | |
|-----------------------------|------------------------------|
| 1. Hacha - Axe (Martillado) | 10. Punetazo - Punch |
| 2. Broche - Brooch | 11. Abrazadera - Clamp |
| 3. Escolpa - Chisel | 12. Hacha Moneda - Money Axe |
| 4. Aguja - Needle | 13. Cuentas - Beads |
| 5. Anzuelo - Fish Hook | 14. Anillo - Ring |
| 6. Gancho - Hook | 15. Abrazadera - Clamp |
| 7. Coa - Hoe | 16. Brazalete - Bracelet |
| 8. Lezna - Punch | 17. Cascabel - Bell |
| 9. Alambre - Wire | 18. Cucharon - Dipper |

THE STORY OF TWO BELLS

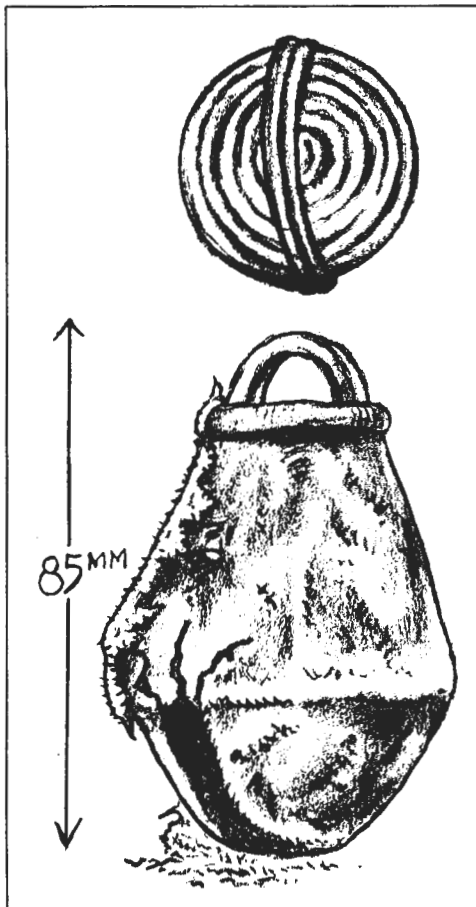
Regarding the diffusion of specific skills, traits and artifacts, anthropologist Edward Tylor laid out in 1879 a rule for judging such processes. According to Tylor, (Ref. Pg. xii, Man Across the Sea) "The probability of contacts increases with the ratio of the number of arbitrary, similar elements in any two trait complexes."

Using the above rule, I would like to compare the traits of two bells. One was found in the immediate vicinity of Tzintzuntzan, the Tarascan Capital of the Indians who lived (and now live) in the state of Michoacan, Mexico, and the other found in the area of Roosevelt Lake, Arizona. The two bells were separated by some fifteen hundred miles.

Since there is no hard evidence that the Anasazis and other groups who lived in the vicinity of Roosevelt Lake worked with copper or bronze, it must be assumed that the bell found there was traded from another culture.

Let us compare, one by one, the traits of the two bells and see if a conclusion can be reached as to the origin of the so called "Blumer bell" found at Roosevelt Lake. This bell is listed in Sprague and Signori's inventory of bells found in the southwest. (See comparisons)

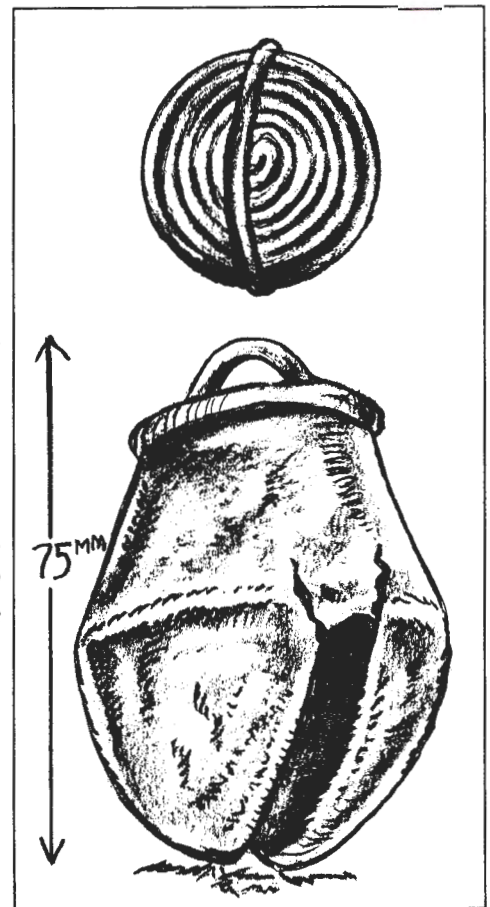
Blumer



Rings = Near Identical
Caps = (Spiraled wire) identical
Apertures = same
Jinglers = same
Shape = Typology the same
Method of casting (Cire-perdue)
Aperture stress cracks = same

My conclusion would be that the two bells were made by the same Tarascan metal smiths from around Tzintzuntzan, in Mexico. The date, I would judge to be about 1100 - 1200 A.D.

Tarascan

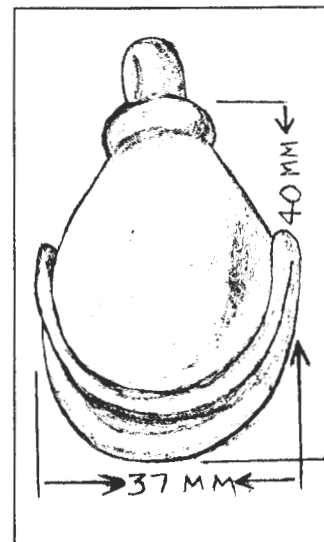
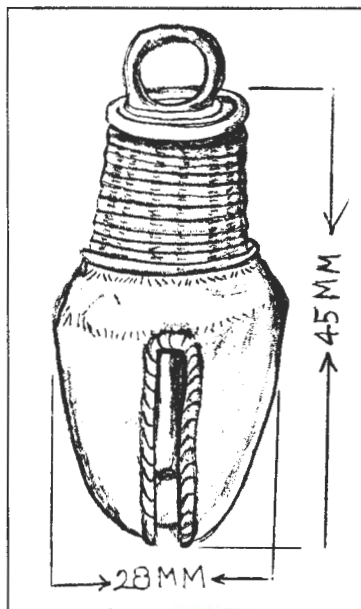


IMPROVEMENTS IN APERTURES OF BELLS

In studying the Tarascan bells, one typically finds cracks in the extremities of the apertures. These imperfections, according to some metallurgists, are so-called "stress cracks" which develop when the metal cools after casting.

Metalsmiths from the area of Colima, where the famous clay *perritos* (dogs) were made, avoided the cracks around the apertures of their bells by simply making them heavier and applying a reinforcement band around the openings. The Tarascans and Mixtecas also picked up this practice.

The illustrations are of bells on display in The Regional Museum, Guadalajara, Mexico.

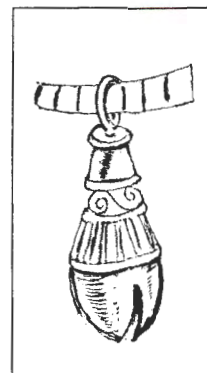
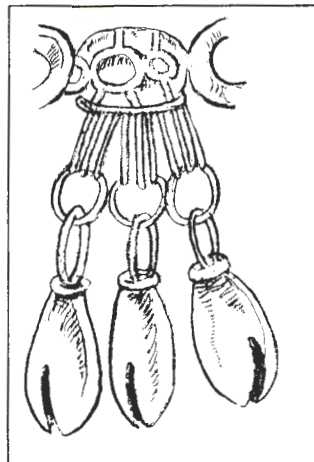
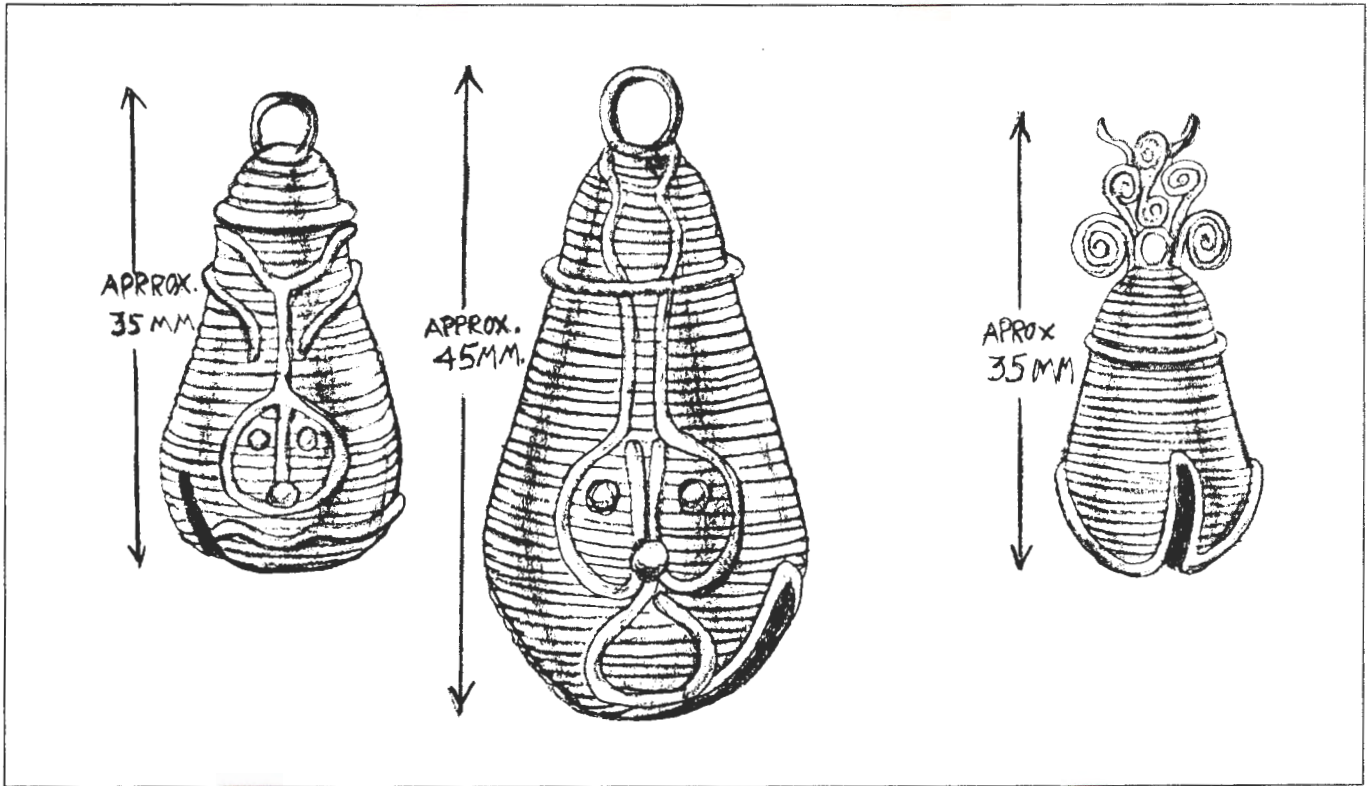


MIXTECA METAL SMITHS

The Mixteca Indians in the area of Monte Alban during the Post Classic Period were great craftsmen. They worked in gold, silver and bronze. Their intricate, beautiful work in creating jewelry and bells is to be marveled at.

The three Mixteca bells shown are museum sketches from the Museo Regional, Guadalajara, Mexico. Two other examples of necklaces shown are from Hasso Von Winning and Alfred Stendahl's Pre Columbian Art of Mexico and Central America.

According to Vaillant, in Aztecs of Mexico, "another center was established in Oaxaca in Mixtec times. The Oaxacan ornaments, although deficient in some of the southern technical developments, surpass in design and workmanship, the best of the older gold work of Peru and Ecuador." (1962 : 120)



TRACING A TRADE BELL'S SOURCE THROUGH TYPOLOGY

In studying the typology, coding and illustrations in an article by Sprague and Signori (1963) on prehistoric southwestern copper bells, I was fascinated by a small, globular bell with a stylized face on it. I was surprised some time later, while examining a collection of prehistoric Mexican artifacts, to discover the same stylized faces on bells in two necklaces displayed.

Both of the necklaces illustrated below came from the area of Tzintzuntzan, the capital of the prehistoric Tarascan Empire in the state of Michoacan, Mexico.

The bell illustrated in the Sprague and Signori article is typed "IA5A - globular, simulated wirework face design on resonator body, ring for suspension. Illustration is of the Fewkes Wupatki bell." The two bells in the inventory of this type are from Wupatki, north of Flagstaff, Arizona, and from Casas Grandes, Mexico.

Since the two necklaces mentioned above are from the Tarascan area of Michoacan, Mexico, one could speculate that there existed, prehistorically, a route or trade path from that area, through Casas Grandes, and into the southwest United States.

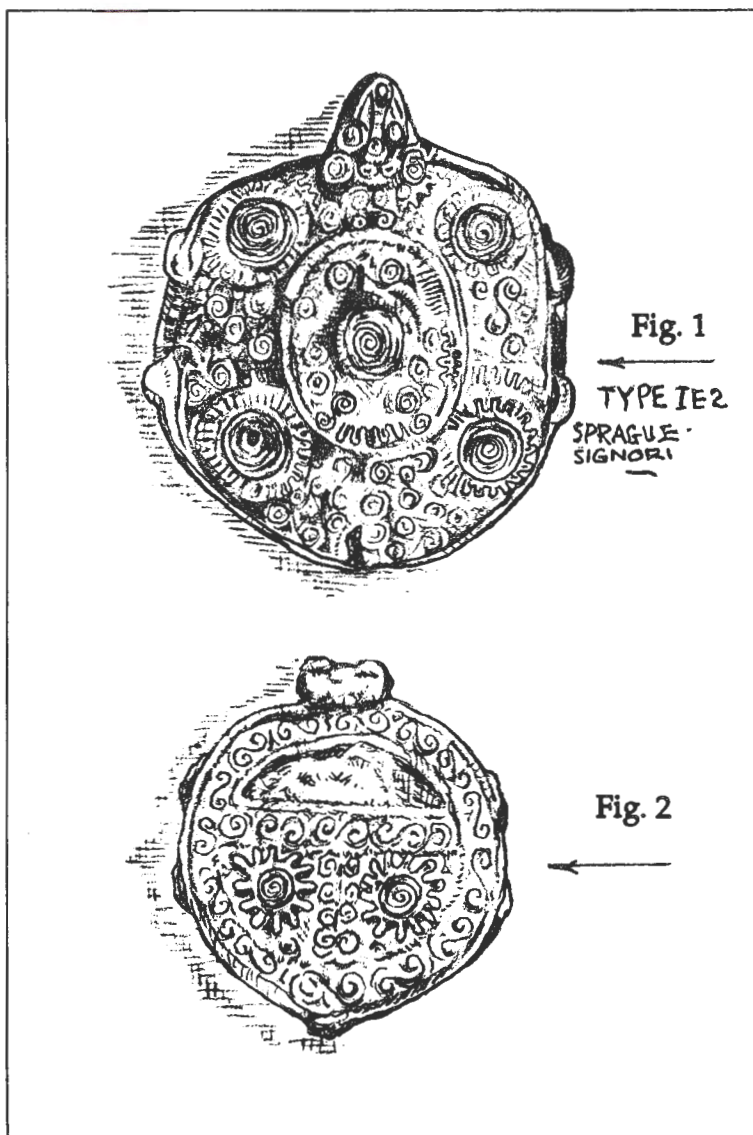


TYPOLOGY AND DIFFUSION

Figure number 1 is a sketch of a turtle bell which was recovered by Di Peso at Casas Grandes, in Chihuahua, Mexico. This bell is now in the National Anthropological Museum in Mexico City. (Ref: Bernal, *The Mexican Museum of Anthropology*, 1970 : 158)

Figure number 2 is a sketch of a turtle bell found during a dig on Cherry Creek, Arizona in the general area of the Old Q Ranch. It was sketched from a reconstructive drawing by Matt Thomas, who studied the somewhat battered bell, using a magnifying glass, carefully made his drawings (Figure number three). The outcome shows a bell remarkably like the Di Peso bell in design. The intricate wire figure almost certainly links it to the Casas Grandes turtle bell.

The complex design work and the skillful application of wire work on both bells strongly suggests that they were of Mixteca or possibly Tarascan origin.



A TYPE OF BELL FOUND IN DIVERSE PLACES

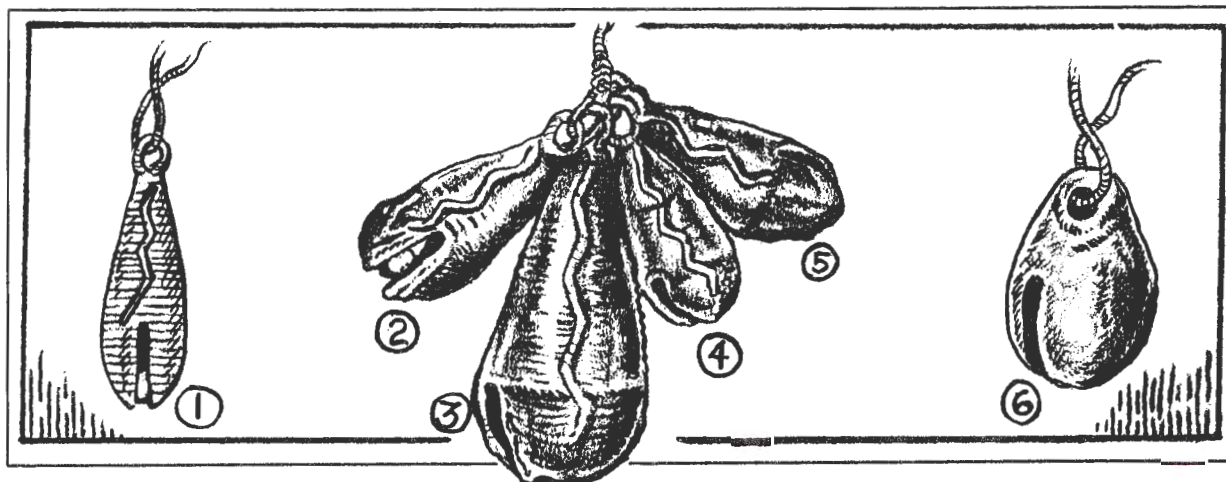
Reference is again made to Inventory of Pre-Historic Southwestern Copper Bells, Roderick Sprague and Aldo Signori, Journal of Archaeological and Historical Society, Volume 28, Number 4, April, 1963. Figure 2, Page 6 shows an illustration of type ID7a - elongated pyriform, simulated wirework, zigzag design, ring for suspension. One bell of this type is listed in the inventory. It was found, according to the map, near Roosevelt Lake, Arizona, at the Hilltop House site.

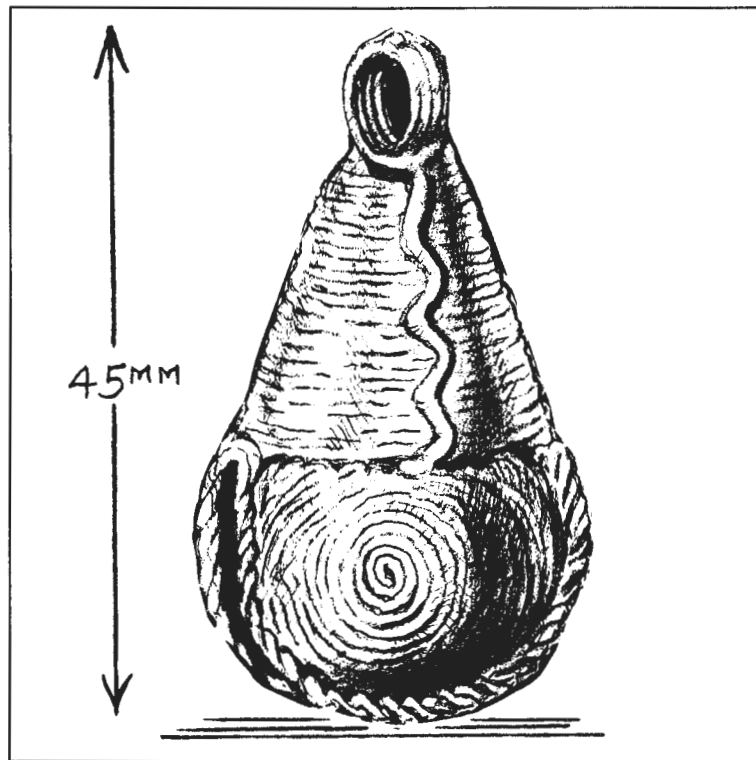
Shown below is my sketch of the type ID7a bell, together with four of this same type I have located during the past twenty-five years. Also shown is a small clay bell found in the State of Jalisco, Mexico.

One may speculate concerning the broad dispersement of the little elongated pyriform bells with the zigzag design. Some call them snake bells. The probable source is the Tarascan area of the State of Michoacan, Mexico. It is possible the zigzag or snake motif might have devolved from the God Quetzalcoatl of the Aztec Indians or the same god called Kukulcan among the Mayas. Both were known as the plumed serpent.

The little clay bells are widely dispersed. They are found throughout Mesoamerica and also in the Southwestern United States. They were probably spinoffs of the copper bells, made by people skilled in working clay but totally unskilled in the matter of metal working.

- | | | |
|--|--|---|
| 1. Type ID7a
of Hilltop House
Site | 2. From State of
Michoacan,
Mexico | 3. From State
Colima,
Mexico |
| 4. From lower
Gila River in
Arizona, near
Gatlin site | 5. From State
of Jalisco,
Mexico | 6. Clay bell
found in
State of
Jalisco |





A TUMBAGA BELL OF TYPE ID7a (SPRAGUE - SIGNORI)

Years ago, I obtained a bell, shown above, from an elderly man who had retired in British Honduras, now Belize, where the bell was found. The little bell is not covered by any sign of patina or verdi gris, and glitters and shines under light. It is beautifully made and appears to be of Tumbaga, an alloy of gold, copper and sometimes silver.

The jingler is a tiny rock. Filigree is expertly applied. The aperture is bordered by braided wire. Four strands of wire make up the ring.

There is no evidence of wire on the *inside* surface of the resonator; it appears to be slightly deteriorated bronze. This would seem to indicate the bell was made in several stages.

Step 1 - The resonator was cast, using bronze.

Step 2 - The wire ring, wire designs and braided wire around the aperture were applied (or soldered on) using a tumbago mixture of metals.

Step 3 - The bell was heated and the *mise en couleur* process used in which the copper was leached from the surface, using acid.

Step 4 - The remaining gold was then burnished, thus completing the gilding process.

This little bell, type ID7a, found in British Honduras seems to extend further the area of diffusion for this type of bell.

References: Ancient Arts of the Americans, G.H.S. Bushnell, London Thames and Hudson, 1965, Page 231.

The Mexican National Museum of Anthropology, Ignacio Bernal, Director, Thames and Hudson, London England, 1968, Page 23.

THREE LEGGED BELLS

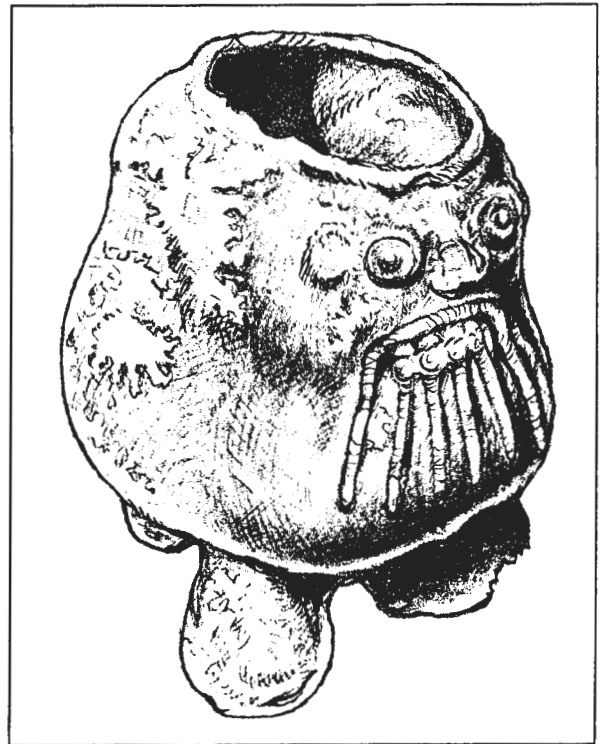
Two of the finest bells I have ever encountered are three legged. One is a very intricate basket bell with delicate filigree loops, zig zags, and swirls. It has two small rings on the lip for hanging. It is in my collection and there is a near identical, but larger one in the Regional Museum, in Guadalajara, Mexico.

The other bell is also three legged and is a solid creation. It is in the form of a little hump backed man with whiskers on his chin. The legs of both are small bells. It is also from my collection.

The first bell described is Mixteca. The second, the little man, is from the Tarascan area.

Some knowledgeable and authoritative people have speculated that the Tarascan bell, with the be-whiskered, popeyed humpbacked little man represents Tlaloc, the rain God of the Nahuatl - speaking people of the central and southern areas of Mexico, among whom were the Aztec people of prehistoric Mexico.

It is thought that the bell (type IA5A) shown on Page 6 of Sprague and Signori's Inventory of Pre-Historic Southwestern Copper Bells represents this same god.



SOCIAL SIGNIFICANCE OF SMALL PRE-HISPANIC BELLS

In Justino Fernandez' book Mexican Art published by the Hamlyn Publishing Group Limited, 1965, there appears a detail of Diego Rivera's painting "The Market Place." Rivera's masterpiece, finished in 1935 in the Presidential Palace, Mexico City, represents his interpretation of the great marketplace of Tenochitlan prior to the Spanish invasion. Rivera's vision probably lies somewhere between fact and poetry. (Ref. page 37). Nevertheless, it illustrates that bells were probably rather important social and status symbols of the times.

In the lower right corner of his painting, one sees an attractive lady apparently flirting with a young noble man. She is lifting her skirt ever so slightly to reveal a cluster of little jingling, golden bells, below her right knee. He, in turn, appears to be jingling a larger bronze bell hanging from his neck, as he returns her admiring glance.

Bells were probably symbols of rank for young nobles and luxury items for the wealthy. The men wore the large Tarascan type bells while the ladies wore the dainty little bells laden with filigree designs which were much more feminine. The small bells were probably from the state of Oaxaca.

A large bell is shown in my cartoon type rendition of a section of the Rivera painting. These large Tarascan *cascabeles* varied in the wire designs and casting techniques but in the basic shape were very much alike. The little bells varied from plain to very fancy. (See drawing next page)

Anciently, the use of small bells for religious, ceremonial or ornamental purposes is well documented in many early cultures throughout the world and also here in the southwestern United States. Jesse W. Fewkes in his writings concerning the Pueblo Indians, at the turn of this century reported that they were continuing to use their *ancient* bells in religious activities. Old copper bells were said to be used in secret rites of the modern Tusayan villages and in certain ceremonial foot races; for instance, bells of antique pattern and of great age were tied to the waists of the runners.



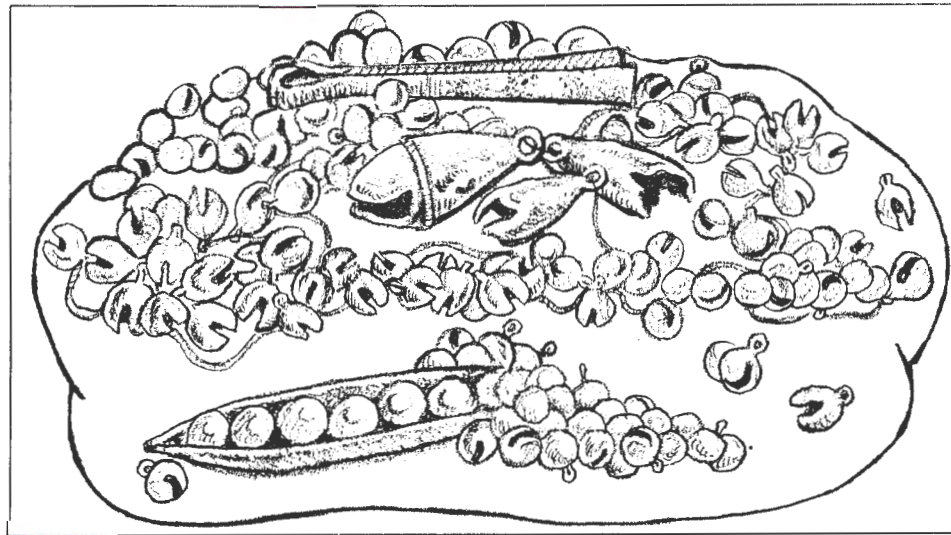
A MYRIAD OF TINY BELLS

Many years ago, a *granjero* (farmer) from the Tarascan country of Michoacan, Mexico brought me a small paper sack half-full of pea sized bronze bells. Also included in the bag were tweezers, the three larger bells and bits of cotton fabric. Presumably, the three larger bells were pectoral pieces.

I was able to string about a hundred of the tiny cascabeles. The rest were in poor condition and literally hundreds were amalgamated in little clusters.

None of the bells appeared to have jinglers, probably because of their minute size. The jingle sound would have come from the three larger bells associated with them.

All were *cire-perdue* cast, which must have called for great adroitness and patience on the part of the metal smith. Why a craftsman undertook to cast such small ornaments, I do not know. A pod of peas is drawn in the illustration to emphasize the small size of the bells. In the absence of jinglers, perhaps "beads" would be the appropriate nomenclature for these small creations.



MOCHICA - NAZCA METALSMITHS OF PERU

The ancient Mochicas were masters of metal work, producing jewelry of great refinement. They were skilled smelters and excellent coppersmiths. They also excelled in working with gold and silver. Rafael Larco Hoyle writes that they also knew lead and iron. The art of cire-perdue casting was widely used.

Illustrated below are some excellent examples of beautiful fabrication of bell laden jewelry. Tiny faces can be seen in the center of the earrings. The appendages are somewhat mangled. The bracelet still has the original little rope the bells were attached to.



SOME VERY EARLY SMALL BELLS IN THE OLD WORLD

A cluster of small Assyrian bells, found in the Palace of Nimrod, are probably the oldest of which there is an authentic record. They were discovered by A.H. Layard and exhibited to the public in the British Museum. They measured from 1 1/4" high by 1 1/4" in diameter to 3 3/4" high and 2 1/2" in diameter. They were made of bronze with iron clappers.

These early bells had holes in the top which were used to fasten the clappers. They resemble bells used in China today.

In China, bells were used in religious ceremonies millennia before the time of Christ.

In the Bible, Exodus 39:25, references are made to bells about 122 B.C.

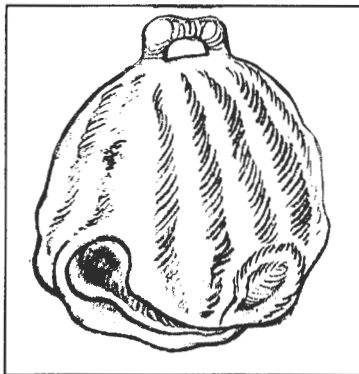
Other early societies that made bells included Babylonia, Egypt, Rome, Greece, China, Hindustan, Africa, etc. Roman bells were called *tintinnabula*.

In the Koran, we read that the Arabian women of Mohamet's time wore "noisy" ornaments.

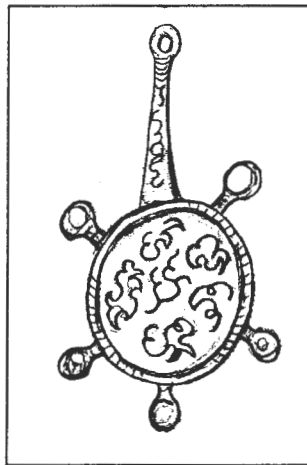
Small bells were mentioned by Euripides (Athenian, 406 B.C.), and by Virgil, a Roman poet, (70 - 19, B.C.).

It is surmised by Ernest Morris and other authoritative bell historians that the bells were introduced to England when Caesar crossed the channel into England about the time of Christ.

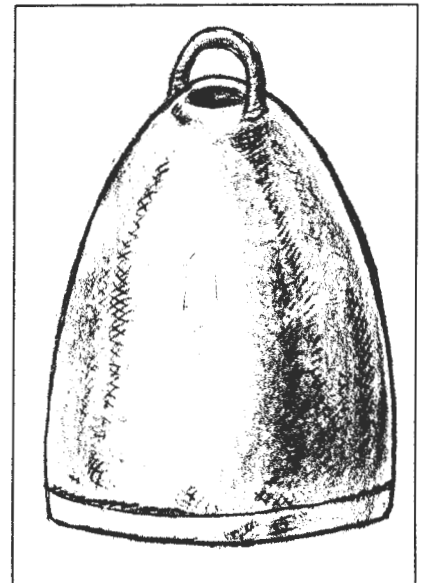
Early Roman Bell



Priest's Rattle,
China



Assyrian
Bell



POSSIBLE DIFFUSION OF BELLS
FROM THE MEDITERRANEAN TO THE AMERICAS
(FROM TINTINNABULA TO CASCABEL)

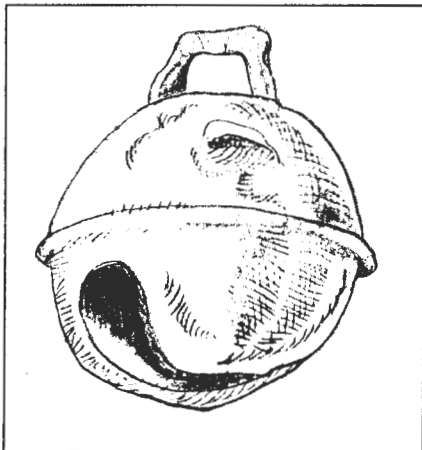
Using the criteria established by Tyler, it is interesting to compare the Mediterranean bells, or Tintinnabula, with bells of the early Americas, the Cascabeles. Both bells were made by the cire-perdue method, from bronze, had like apertures, jinglers, rings, and shapes. The only difference in the two Bronzes is that tin was used in the alloy in the Americas, whereas zinc was generally used around the Mediterranean region. Both alloys are similar metals with low melting points. (Tin was also used in the Mediterranean - Phoenicians sailed to Britain for tin ores.)

Early Spanish Conquistadores brought little hawk and horse bells with them to the Americas. It is interesting that Columbus, on his fourth voyage, encountered near the Bay of Honduras, a large canoe of Chontal - Maya "registry." There were some forty souls aboard. The cargo included cotton mantles, blouses, loincloths, wooden swords, with pieces of flint or obsidian glued into slots on each side, *little copper axes and bells*, plates and forges to melt copper, razors and knives of copper, etc.

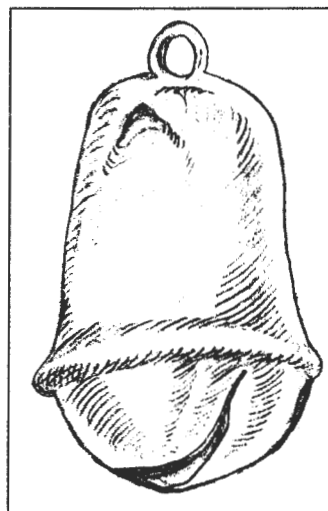
Ernest Morris, in his book Tintinnabula, shows similarities between the bells of the Americas and those of the Mediterranean and other old world areas.

The sketches below are of bells located in the Leicester Museum in England.

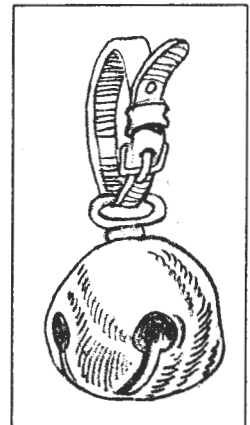
Early Mule Bell



Wreay Cock
Fighting Bell



Animal Bell



SOME CLASSICAL BELL TERMS

Crotal -	Ancient bell, castanet or rattle
Krotalon (Crotulum) -	Small rattle or bell
Cascabel -	Small Mexican bell
Tintinnabulum -	Earliest Roman bell
Pestasius -	Greek-Roman tinkler
Kodon -	Greek for hand bell
Squilla -	Small shrill bell
Pebetes -	Spartan funeral bell
Nota -	Small bell
Cymbalum -	A bell for cloisters

CONCLUSION

Little bells have been in the world with us for a long, long time. The old and hackneyed saying, "necessity is the mother of invention," does not seem especially fit in the case of small bells. They neither provided food nor offered much protection from the elements of nature. But, nevertheless, they were invented at least once and maybe several times. Perhaps they came about just to provide joy for mankind.

Anciently, bells were used ceremoniously throughout much of the world. They were prominent in the rituals of many religions. Dancers wore them on their brightly colored costumes. During the crusades, knights attached them to their armor. English ladies wore them on their girdles. In ancient Greece, they were hung on the necks of malefactors on their way to the executioner. In Asia they exorcised evil from individuals.

In our southwest, old bells from Mexico were used in secret rituals and were tied to the waists of runners in ceremonial races.

In our times, box, hame or latten bells are used as ornaments on the harness of our prized Clydesdale and Percheron draft horses. Little jinglers are attached to our sleighs.

In ancient Latin America, beautiful little *cascabeles* were cherished possessions. The descendants of the metal smiths of those times continue today to craft fine bells.

In these pages I have tried to give some of the history of bell making on the two western continents and have attempted to narrate how these groups of craftsmen were able to create such beautiful little *cascabeles* as well as other skillfully crafted items.



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