

Musical Instruments of the Prehistoric Southwest

A presentation by Dr. Emily Brown



The world was not silent in prehistory. In addition to sounds in the natural world, there were human sounds, both mundane and sacred. Because of the physics of sound, sounds should be thought of as events, not objects, activities rather than artifacts. Something is happening for sound to exist. Little physical trace remains in comparison to the complexity of the original “something”, so there is little chance of reconstructing what sounds in prehistory were like. However, sound production and experience are significant aspects of human behavior involving transmission of information with emotion and symbolic components, and so it is worth studying even if it cannot be directly observed. In my research, I look at the physical and social contexts of music in the prehispanic Southwest, and how those contexts changed over time and space.



While the way music affects the physical body is not well understood, we know that music affects people's heart rate, blood pressure, skin temperature, and respiratory rate as well as bodily processes and functioning. Music exists in time, and requires people to experience it moment by moment. This temporal organization is made possible by rhythm, without which melody and harmony are not very interesting. Rhythm is closely tied to physical movements such as dance and rhythmic activities during work. Making music is aural, tactile, sometimes visual, and involves people in reality, in the immediacy of now. Psychologically, it meets human needs for aesthetic experience and self-expression, and is strongly shaped by culture. It can bring a sense of accomplishment, of self-esteem, and a feeling of belonging when done in a group. It can be an outlet of socially acceptable competition. It helps develop attention and memory, and can invoke memories and associations. In ritual, music can be the means of invoking an emotional response, it can be entertainment or spectacle to bring people to a religious event, or it can even be thought to be a supernatural power itself.

The Human Body as Instrument

‘Upon our arrival there came to us in procession and singing, more than two hundred Indians, men and women... They made music by beating their hands while sitting around a big fire. They sing, and in time with the singing they dance...’

Diego Perez de Luxan

‘The Indians hold their dances and songs with the aid of some flutes which have holes for the fingers. They made many tunes, singing jointly with those who play. Those who sing clap their hands in the same manner we do... Others were singing, although not very harmoniously.’

Don Antonio Mendoza

People’s experience of sound begins in the womb, and we begin to explore the sound-making capabilities of our own bodies upon birth. People can clap, snap their fingers, whistle, hiss, click our tongues, stomp, and beat our chests. We can speak, sing and chant, and we can use vibrato, lisps, nasal tones, quavers, humming, and so forth to alter the sounds we make with our mouths. We can use those for informal speech, story-telling, prayer, songs, and so forth.

Use of the human body as an instrument leaves little or no physical remains in the archaeological record. Some of the only sources we have for looking at the way people made music with their bodies in prehistory is to read accounts from the earliest Spanish explorers.

Speech is Action



There are many, many examples in the ethnographic literature of song and spoken words. Rather than go through a list of examples, I just want to point out an underlying belief system that is widespread enough that it may be of some antiquity: namely, words can be compulsory, and speech is an action with real-world consequences. What this means is that some words, songs, or prayers are so powerful that they can be dangerous to people who aren't supposed to hear them. Some songs are sung in a whisper so that even other people with ceremonial knowledge won't hear and be harmed by them. Along with this goes the idea that the power of a song or prayer can be diluted if it is shared among too many people, and so some are kept secret for that reason. This can be done either by restricting physical access and singing them only in very private spaces, by singing them very quietly, or even by singing songs with very archaic words or words in other languages so that few if any people will understand what is being said. One last thing to consider is that if speech is an action that affects the real world, in some contexts it must be done exactly correctly or it won't achieve the desired effect. Often, if the affect is not achieved, it is the performance that is most likely to be criticized, not the ritual itself.

Flutes

...not almost
wholly a source of
noise...

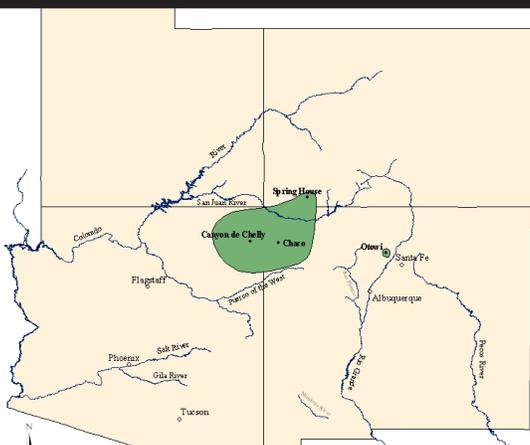
Gilman 1908

We find both flutes and whistles in archaeological sites in the Southwest, and they differ in that flutes have stops like the one in this photo that allow a variety of notes to be played while whistles generally do not. The pitches of flutes are determined by the length of the instrument—the longer they are, the lower the sound. Similarly, the more holes are covered, the lower the pitch, the fewer, the higher the pitch.





These are examples of some of the few wooden flutes I found in museum collections. The painted flute on top and the carved one below it were both found at Pueblo Bonito. The two bound together and the one on the right are Basketmaker flutes that were found in northeastern Arizona. The two bound together have feathers tied to the top that fluttered when they were played. The flute on the right isn't as elaborately decorated, but you can see the worn areas around the stops that show that the fingers of the left hand covered the holes on the top, and those of the right hand the ones on the bottom. The important thing to note about these flutes is that they were all played by blowing across the end rather than across a hole in the side like a modern orchestral flute. In this regard, they are similar to the Japanese shakuhachi or the Middle Eastern ney.



This map shows where flutes of wood and reed have been found. I know of two tiny fragments from Otowi Pueblo, near Los Alamos, but the rest are from the Four Corners area.



These are examples of flutes made from bone. Right off you'll notice that they do have a hole in the side, unlike the wooden flutes I showed you. These still were not played like a modern flute, however. Instead, these were played by blowing directly into the end. A little piece of wax or pitch then directed the air against the edge of the hole in the side, and that made a sound the same way a recorder or penny whistle works. So what we are seeing here is not just a different material, but a whole change in sound production technology. These bone flutes would have been much easier to play than the wooden ones.

You will also see that some flutes have the articular ends of the bones left on, while others were cut off. Kidder found these in different stratigraphic layers at Pecos Pueblo, and he thought the ones with the articular ends



This map shows where bone flutes have been found in the Southwest. As you can see, there are a few from the areas ancestral to the western pueblos, but they were used in more pueblos in the Rio Grande Valley area.



This is an object from Rowe Ruin near Pecos Pueblo that was identified as a clay flute by Kidder. It would be great if it was more complete so we could see if Kidder was right. This is the only example of a clay flute from the Southwest north of Mexico that I know of, so even if Kidder's identification is correct, it is still somewhat of an anomaly.

“The Indians hold their dances and songs with the aid of some flutes which have holes for the fingers. They made many tunes, singing jointly with those who play... They say that five or six get together to play, and that the flutes are of different sizes.”
Don Antonio de Mendoza

This is the continuation of the quote about singing I read earlier. What we learn from this is that flutes were played in ensembles with other flutes as well as with singers. It isn't exactly earth-shattering information, but it is one of the few written eye-witness accounts how and when flutes were played.

“Their houses are well separated and extremely clean in the places where they cook and where they grind flour. They do this in a separate place or room in which there is a grinding place with three stones set in mortar. Three women come in, each going to a stone. One crushes the maize, the next grinds it, and the third grinds it finer. Before they come inside the door they remove their shoes, tie up their hair and cover it, and shake their clothes. While they are grinding, a man sits at the door playing a flageolet, and the women move their stones, keeping time with the music, and all three sing together. They grind a large amount at one time.”

Don Antonio de Mendoza

This is another example of a time when a flute was used. An early ethnomusicologist, Francis Densmore, found that corn ground to the accompaniment of corn-grinding songs sung and played on flutes was used ceremonially.



At Zuni, flutes are associated with warfare. The elder War Brother has one, and flutes are associated with cicadas which are themselves considered war medicine. Many bone flutes are made from the bones of eagles and hawks. In Zuni mythology, there is a mythical monster eagle called Knife Wing who is known for his scalping. Knife Wing is associated with the Heart of the Sky God, mentor of the Twin War Gods.

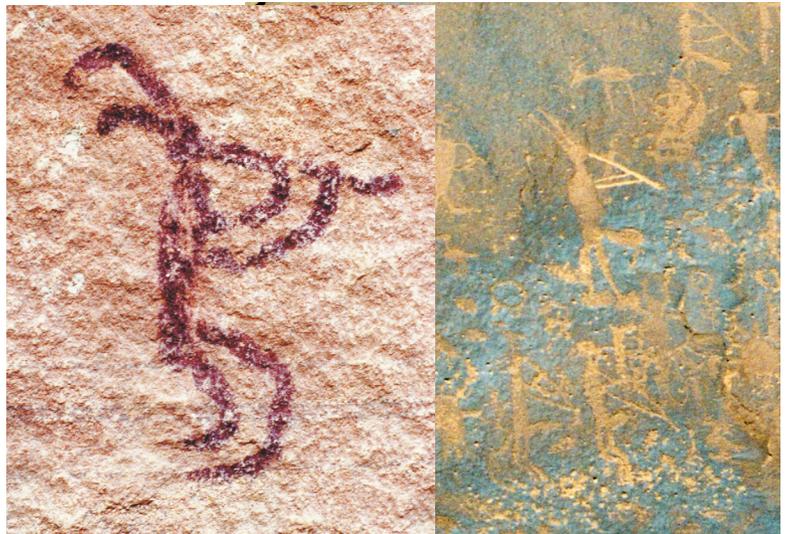


As with singing, there are many, many examples of flute-playing in ethnographic accounts; more complete information can be had from accounts from the western pueblos rather than the eastern ones. To summarize, among the Hopi, flutes are associated with summer, flowers and plants, cicadas, canyon wrens, and flickers. Many flutes and whistles are made from turkey bones. Turkeys are associated with earth, death, and winter. Other flutes are made from the bones of herons and cranes, which of course are associated with water as well as seeds. In general, all birds are considered messengers.

Those of you who came to Dennis Slifer's wonderful talk on fertility imagery saw several examples of flute players in rock art and on pottery. I have a few more to show you. The earliest examples are from sometime around A.D. 400 to 800, and they continue up to A.D. 1400 to 1600. They start out as simple stick figures with flutes like this one with a turkey-shaped bird on its head. Later versions have hunched backs, flutes, phalluses, various headgear, and certain poses become characteristic.



You can see some of the different hump shapes here. One looks like it is carrying a burden basket, while others look more like sacks.



Some flute players have no penis, while others are rather exceptionally endowed.



There are a few animals with flutes as well, such as this big horned sheep.



There isn't time to go into all the details about flutists, and I highly recommend the book on fluteplayer images in *Rock Art* by Dennis Slifer and James Duffield to those of you who are interested in them. I'll just say that flutists vary quite a bit from one another, and there seem to be certain groups of them for which interpretations can be suggested. Generally speaking, some seem to represent a Hopi clan symbol that is a flute-playing guide to the Hopi during their migrations. Others appear to be cicada flutists who are guides also. Other flutists are closely associated with animals or are animals; these appear to be associated with shamanic activities and altered states of being. Some appear to be renderings of mythological events, such as those depicting the activities of Kokopelli. While all of these figures are very different, they share a beneficence towards human beings, and many are directly associated with warmth, fertility, and the animal world.



These objects come from a medicine bundle, and you can see all the shells and different minerals that were in it. Some of the projectile points date to the Archaic, while the flutes are probably from the Pueblo IV period at least 600 years later. The tradition of wooden flutes was already strongly developed by Basketmaker II and III times and the musical tradition associated with it and other instruments went hand-in-hand with shamanic male ceremonialists involved with the political and religious lives of their communities. This trend reached its height at Chaco with theocratic leaders that appear to have used elaborate musical instruments as part of the rituals held in the canyon. With the fall of Chaco, the abandonment of the Colorado Plateau, and the florescence of the Kachina religion, wooden flutes were no longer common and in the eastern pueblos, which experienced a great influx of population, bone flutes incorporating a new technology and a new ideology became commonplace.

Whistles

“Suddenly a screeching sound was heard outside as that of a hawk.”

Dorsey and Voth



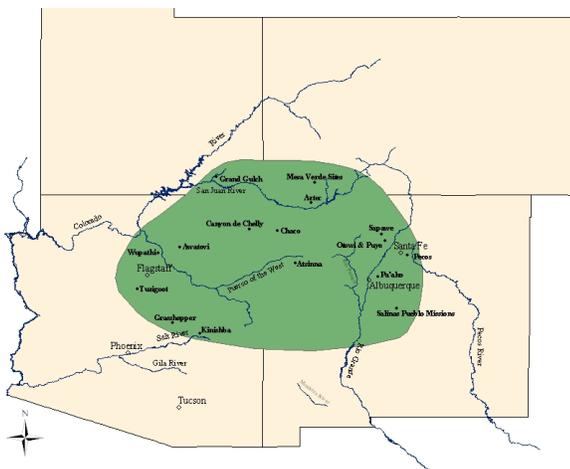
We move on now to whistles—by far the most commonly found type of prehispanic musical instrument. I don’t have any good Spanish quotes specifically about whistles—they are always translated as referring to flutes. I do have a few interesting quotes from ethnographies, and I’ll get to those in a minute.



First, I want to talk about the different kinds of whistles. This form is the standard for the vast majority of bone whistles. They vary a lot in length and diameter, but most are made from radii and ulnae of large birds such as eagles, hawks, owls, cranes, turkeys, and whistling swans as well as a few from mammals such as antelopes, bobcats, and jackrabbits. Many have a lump of wax or pitch below the hole in the shaft that served as a fipple the same as the bone flutes.



Particularly in the Rio Grande and Mesa Verde regions, some whistles were made in matched pairs using bones from the right and left sides of a single bird.



As you can see, bone flutes have been found in many parts of the Southwest.



As with wood and reed flutes, wooden whistles did not preserve as well as bone. There were probably many more than those that have been found by archaeologists. I know of only two wooden ones. One was found in the same Basketmaker cave in northeastern Arizona as some of the wooden flutes. The other is the one shown in the upper photo. It is from Canyon de Chelly; and unfortunately we have no information on how old it is. I know of only six reed whistles, all are Basketmaker in origin and all are from the Four Corners area. Three are shown in the lower photo.

“The opening at the top of the bone is placed tightly against the lower lip... then drawing the upper lip down with a slight puckering of the whole mouth, and sucking in with a short, chirping breath, the tone produced will resemble that of a mother turkey calling its young. By careful practice is covering and uncovering... the hole in the side...it is an easy matter to imitate all of the calls of the wild turkey.”

Jeancon

[As part of the Soyal ceremony, two Hopi men] prepared some paints, taking the water for mixing them from a small bowl into which a man whistled with a bone whistle all day, imitating the warbling of a bird; when one man was tired, he was relieved by another.

Many of the whistles found in archaeological sites are interpreted as bird calls, as the first quote suggests. Not all uses were secular, however. The second quote is an example of a ceremonial use, and there are other examples as well. Writing in 1939, Elsie Clews Parsons reports seeing Keresan shamans using eagle bone whistles when venturing forth to fight witches. Similarly, a whistle made from a bear bone was employed in combat against witches causing disease.



There is another type of whistle that really should be classified as a reed instrument—the bitsitsi whistle. Bitsitsis were made by cutting a section of bone tube in half lengthwise, inserting a membrane of reed or skin, and binding it back together again. By blowing in one of the ends, one caused the membrane to vibrate and make a sound in much the same way as when you blow on a piece of grass held between your thumbs.



While with the Corn maidens and soliciting their return to the starving people, Bitsitsi found a rabbit, and said: “This is an animal that is happy all the time. It is good to make people glad.” He killed it and made a whistle from one of its forelegs and bound it with sinew from the rabbit’s back. This is the whistle he played while leading the maidens back to the people.

Benedict

Bitsitsi whistles are used during one of the Zuni Shalako ceremonies, and are named after a particular mythological personage who was the musician and jester to the Sun Father. The bitsitsi whistle carried during the Zuni ceremony is referred to as a “rabbit tongue”, though at Hopi the sound is compared to the cry of a hawk. These whistles have been found at Rio Grande sites as well. Bitsitsi whistles were most common during Pueblo III and IV times, and seem well correlated with the Kachina religion. I haven’t found any other references to use by historic pueblos, but certainly they continued to be used by the Zuni into modern times.



As with the anomalous possible clay flute, there are anomalous possible clay whistles. Clay whistles are relatively common in Mexico and Central and South America, but only four have been found in the Southwest. I don't have photos of them all, but this is one that was found at Awatovi and unfortunately there isn't much published information about it. One could blow across the hole and get a sound, but whether it was meant to function that way isn't clear. The rest are equally suspect, though Kidder found one out at Pecos that worked like an ocarina and gave a high, piercing note that is pretty convincing.



Since whistles are the most commonly-found instrument from prehispanic sites, it should come as no surprise that there is a great deal of variation in form, material, and function. Similar to flutes, however, vegetable materials such as wood and reed seem to have been abandoned in favor of bone by Pueblo IV, and a much wider variety of animal species was used, including large birds that offered longer bone lengths. There is also an exponential increase in the numbers found from Pueblo III and IV sites compared to earlier periods. It is probable that the animal species from which whistles were made contributed to their significance, especially those made from eagles, owls, and other animals not usually used for food. There is ethnographic evidence that whistles from particular animals were thought to assist the users by giving them some of the power and strength (and any other culturally-attributed characteristics) of the animals from which they were made.

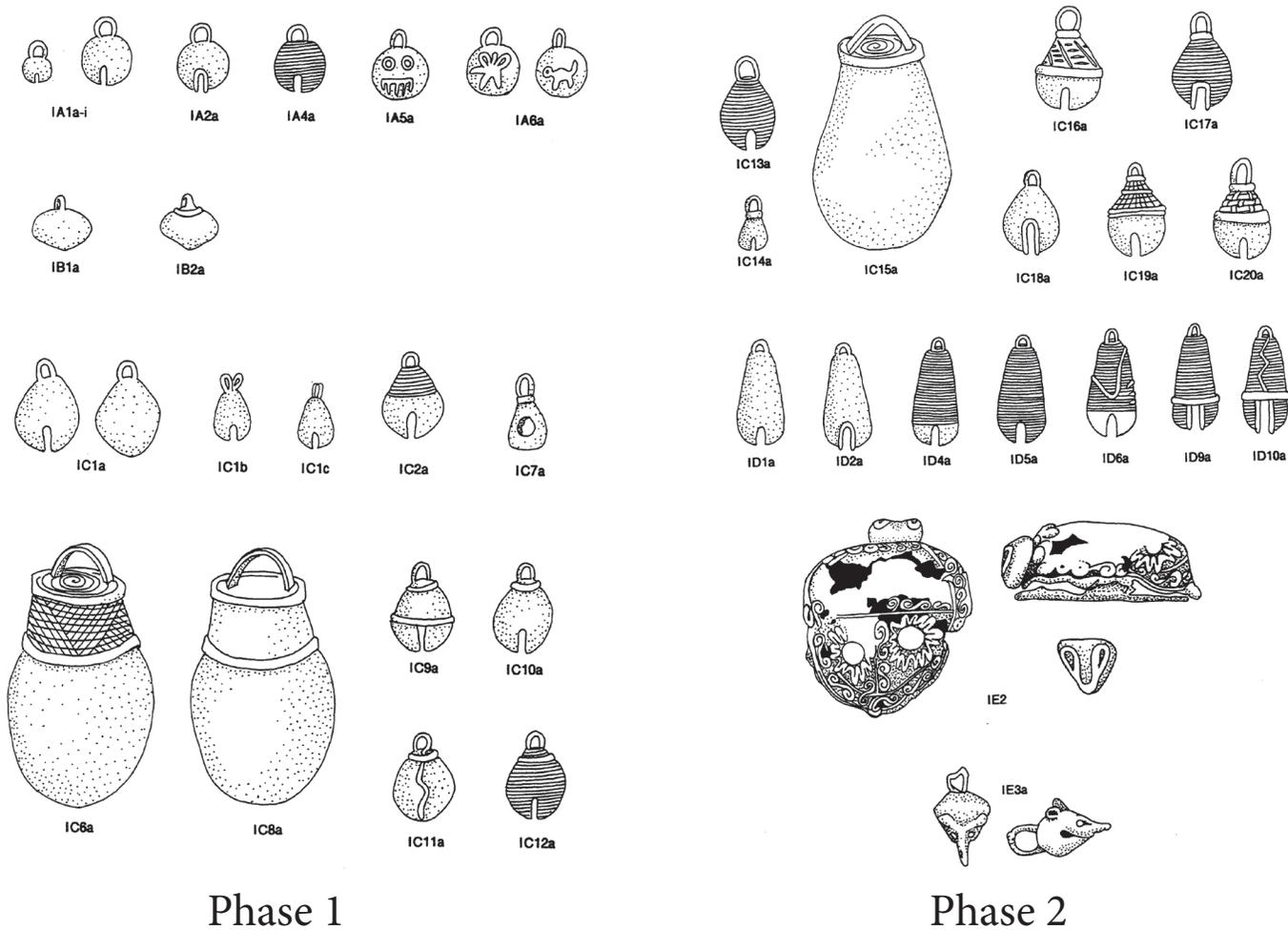
Bells

...the sound of morning star rising...

Parsons



Virtually all the bells found in the Southwest are pellet bells—spherical bells containing a loose clapper inside like sleigh bells. Prehispanic Southwestern bells were made from either copper or clay, containing small pebbles, balls of clay, or pellets of copper.



Phase 1

Phase 2

Research on copper bells has been going on since the 1930s, and some very good research was done by Victoria Vargas and published in 1995. Copper bells were made in West Mexico by using the lost wax casting method. There are two phases to West Mexican metallurgy, the first lasting from A.D. 800 to 1300, characterized by the use of pure copper and the production of bells, needles, rings, awls, and tweezers. Phase II lasts until A.D. 1520, and is characterized by the use of a wider array of alloys (allowing for thinner walls in bells and simulated wire work), and the continuation of the same objects as Phase I with the addition of needles and cutting tools.

Being of an exotic material and a trade good from a long ways away from most parts of the Southwest, copper bells were probably very valuable items. We know they were considered primarily decorative because some have been found with shell and turquoise beads.

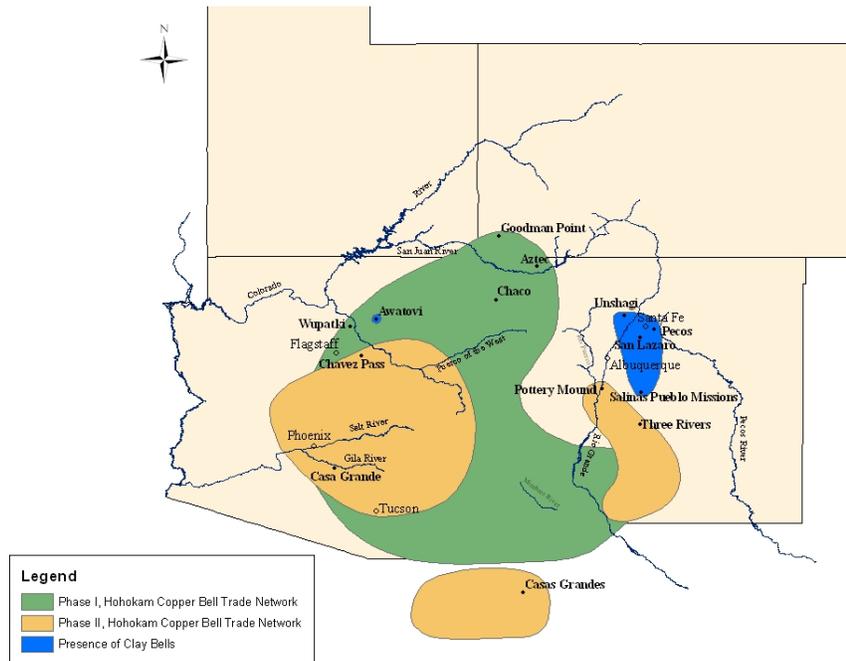
Copper



You can see here the similarities in shape between the copper and clay bells. There are some distinctive forms to clay bells as well. At the upper left is a globular bell, while that at the upper right could be considered flattened or elongated. The bells shown at the lower differ from the other globular bells in that they have four “petals” instead of a single slit on the bottom, and have holes instead of a pinched up part for suspension. The bell on the right was one of a few I found that were decorated; the others were globular but the shape and decoration of this one remind me of a squash.



Clay



During Phase I, the Gatlin site in the Hohokam region appears to have functioned as a trade center for copper bells, and Snaketown and Wupatki also appear to have played significant roles. Phase II corresponds with Casas Grandes at its height, but it appears that, like Chaco during Phase I, Casas Grandes was a consumer of copper bells rather than a trade center. These networks correspond well to shell trade networks, and I'll show you a map of those later.

All but one of the clay bells I know of come from Pueblo IV and Pueblo V period sites, and so they start appearing only towards the end of the Phase II trade network. You can also see how limited the distribution is—with the exception of Awatovi and a few Rio Grande pueblos, clay bells are rarely found at the same sites at which copper bells are found.

‘Esteban sent messengers ahead with his gourd, just as he was in the habit of doing, so that they might know he was coming. The gourd had some strings of jingle bells, and two features, one white and the other red. When the messengers arrived at Cibola, they appeared before the man appointed there by the ruler and gave him the gourd. When he took it in his hands and saw the jingle bells, he at once hurled the gourd to the ground with much anger and wrath. He told the messengers to leave immediately, for he knew what sort of people they represented, and that they should tell them not to enter the city or he would kill them all.’

Hammond and Rey

When the emissaries handed the ruler the gourd and he saw jingle bells, he became very angry and threw the gourd to the ground saying, “I know these people, for these jingle bells are not the shape of ours. Tell them to turn back at once or not one of their men will be spared”.

Hammond and Rey

Shell Trumpets

...the roar of the Great Plumed
Serpent...



Shell trumpets are played very similarly to modern trumpets, though of course they didn't have valves. Without exception, shell trumpets are all made from marine shells, and so, like copper bells, they were probably obtained primarily by trade. The spires were removed and the edges smoothed. Some have mouthpieces of pitch like this one, while others were never fitted with one or the mouthpieces were lost. Some have holes drilled in the lip that might have been for a suspension cord of some kind.



Here is the same trumpet from the side. Most trumpets are found in Hohokam sites. Some of the earliest date to around A.D. 1000, and the continue though around A.D. 1400. Trumpets have been found in other sites in the Southwest. Interestingly, all of them are within the scope of the Phase I shell and trade network, both spatially and temporally. Trumpets rarely made their way north of Casas Grandes during Phase II, and so it seems to be a pattern of trade similar to copper bells.



These are trumpets from Pueblo Bonito at Chaco Canyon. The trumpet at the lower right was found associated with the same elite burials as the painted and carved wooden flutes I showed you earlier. The object in the lower left is shown at a much larger scale than the trumpets—it is a mouthpiece that was encrusted with turquoise from the same burial as the trumpet. The other trumpets came from other rooms in the pueblo.

We know that they were owned by wealthy members of Hohokam society, and they appear to be ceremonial objects used by the elite of Chaco and may also have served as badges of hereditary office.



There aren't many specific references to the use of shell trumpets in the historic and ethnographic literature. We have accounts from Zuni and Hopi which are, not coincidentally, in the area covered by the Hohokam trade network in prehistoric times). At both pueblos, the sound of the shell trumpets represents the voice of the plumed serpent—a deity associated with water and springs, and therefore with fertility and longevity but also with floods, landslides, earthquakes, and volcanoes. At Casas Grandes, shell trumpets were found in a large walk-in well thought to be the site of rituals related to water conducted by shaman-priests.

Curiously, there are many horned serpents in the rock art of the eastern pueblos, but there is no real tradition of shell trumpet use.

Drums

...he is calling thunder...



Wooden drums play a large role in the musical tradition of the Pueblos, but to date, no wooden drums have been recognized in the archaeological record. It is possible that drums in the past were basket drums such as those used in historic times by the Navajo and some of the tribes in southern Arizona; ceramic drums such as those observed historically among the Navajo, Zuni, Acomans, and Apache; dried, rolled hides as has been seen at Acoma and Zuni; drums may have traveled north with Mexican Indians accompanying Spanish explorers; or modern drums may have evolved from a practice of drumming on hide shields acquired from Plains groups late in prehistory. Some of the best evidence for a drumming tradition in prehistoric times, and it is controversial, is the presence of so-called foot drums—stone vaults with plank covers that appear in some kivas. I'll talk more about foot drums in a minute. First I want to talk a little more about the evidence for more traditional hide drums.

“The people came out to meet him and their captain with demonstrations of joy and took him into the pueblo with drums and flageolets, similar to fifes, of which they have many. They presented the Spaniards with quantities of clothing and turquoises, which are found in abundance in that region.”

Pedro de Castaneda de Najera

One would think that if drumming was widespread in prehistoric times, that early Spanish explorers would have remarked upon it the way they did in many quotes about flute players. This passage was written by a member of the Coronado expedition describing their reception at Pecos Pueblo. Unfortunately for us, he does not describe the drums, and this is the only Spanish account of drums I know of. No drums have been found at Pecos, and so we are left with a couple possibilities. First, maybe there were drums that were pots with hides tied on top and archaeologists just haven't recognized them, or maybe they were frame drums made like Plains hide shields were not preserved. Second, it might be that the warmth of the welcome was being inflated by the writer for an intended Spanish audience to foster a sense that the mission was being successful, and that aspects of the description are exaggerated and inaccurate.



Cochiti has been known for its drum making since the turn of the century. One traveler visiting the area in 1894 was unable to purchase drums from the pueblo because they were sacred and simply not for sale. Even after a tourist trade in drums was established, only drums made specifically for sale were available for purchase. In historic times at least, there were designated drummers for each kiva society, and these men were in charge of caring for the drums by “feeding” them cornmeal as well as playing them. Many other pueblos feed their drums, and some drums are named and thought to live in the village like a person and they can even “die”, for example in a fire. There is also an origin myth about drums from Acoma in which the Corn Mother gives instructions on how to make the first drum with a cylinder of wood and elk hide. So drums are closely integrated into the mythology and religious practices of the pueblos, and because of this I don't think drums were brought by the Spanish. If you look at the way the mission bells were destroyed during the pueblo revolt and other ways Puebloans resisted the Spanish, it is hard to imagine that they would have incorporated drums and rejected all the other aspects of European culture, at least early on.

If ceramic drums existed in the Southwest in prehispanic times, they have not been recognized by archaeologists. Most ceramic bowls and jars are shaped in such a way that they could easily accommodate a hide drum head, even temporarily, and there is little about the process of applying a head to a pottery vessel that would leave use wear recognizable to the researcher. All the ethnographic references I found were from Zuni, but no one has ever identified drums among pre-contact Zuni ceramics. It is possible that the concept traveled north with native Mexicans traveling with Spaniards during the entrada. It would be hard to prove this hypothesis, but it is lent some weight by the fact that ceramic drums have been found at sites in northern Mexico. This drum was found at a site near Casas Grandes and is identical to some found there associated with a very elite burial. All the drums were of a type of ceramic that doesn't appear to have been traded, and no similar vessels have been found in the Southwest. The northern Mexico were made in imitation of drums found in sites further south, and may be evidence of the influence of ritual beliefs as well as musical tradition.



Now, foot drums. The notion of foot drums was first proposed by Roberts in his writings on the excavation of the Village of the Great Kivas at Zuni. It should be said that his Zuni workman did not know or would not share with him the function of the vaults he called foot drums. That said, there are examples in ethnographies from the western pueblos of the use of foot drums that I'll tell you about, so his isn't an entirely wild supposition, though not all archaeologists are convinced that all floor vaults are foot drums. The most convincing ones consist of an earthen or stone-lined vault like the one shown here with impressions of wood plank covers. In theory, the planks would have been danced on or drummed with sticks. Given current information, it appears that foot drums were in use mainly among people living in northeastern Arizona, Chaco, and Mesa Verde during the Pueblo III period. There are a few examples from the Pueblo IV period Rio Grande, but it is my sense that the foot drum tradition began in late Basketmaker times and continued through the rise of Chaco. Once Chaco collapsed, only ancestors of the Western Pueblos kept the tradition going and it was never adopted to any great degree in the Eastern Pueblos.

At Zuni they dance on the so-called foot drum, consisting of two planks laid across an excavation, thus placed “so people will come, it draws them in their hearts.” It is believed that these planks form the door for the people inside the earth, “the dead Apache, Navajo, Sioux, Hopi, Acomans, and Mexicans (not for people of Laguna or Americans). It makes their hearts shake and tremble”.

Bertha Dutton

Foot drums are used during the Scalp Ceremony at Zuni. At Hopi, there are rectangular foot drums in some of the kivas that were used during the winter solstice dance, and temporary ones were built in the plaza at Oraibi during the summer Snake Ceremony. Offerings were placed inside some of them and, as this quote implies, they were considered a channel of communication between two worlds. The notion of layered, multiple worlds is very consistent with the origin mythos of many Pueblo groups, who hold that they emerged through multiple layers of worlds into the present world through a sipapu.



There is good evidence that foot drums and sipapus can be considered somewhat analogous. Wilshusen has developed a typology of sipapus, and he recognizes some that are vaults with wooden covers that he also calls foot drums. Interestingly, he observes that these are most often found in kivas that would have been used by whole communities rather than just kiva fraternities or other, smaller groups. More research is needed into the actual capacity of vaults to emit sounds the way the foot-drum hypothesis suggests. What is interesting to me, however, is that at least in the western pueblos, they seem to be a revival of a very old tradition as part of what is known as a revitalization movement in the sense that the Ghost Dance was. That is, by dancing on these drums, people at the turn of the century may have believed they could communicate with ancestors that lived in a time before Euro-Americans came and perhaps even induce them to live again and repopulate the land with people living in traditional ways.

Tinklers

...to make a tinkling sound when dancing.

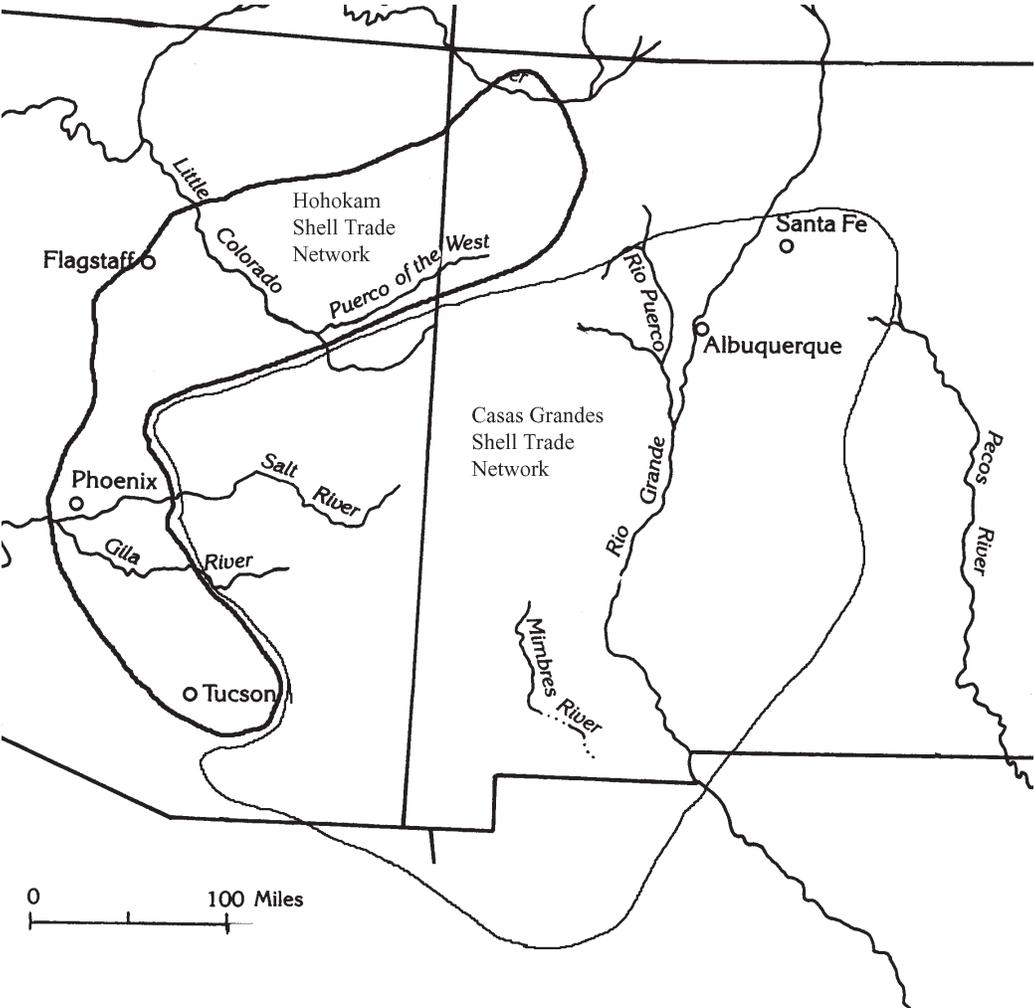
Smith et al.



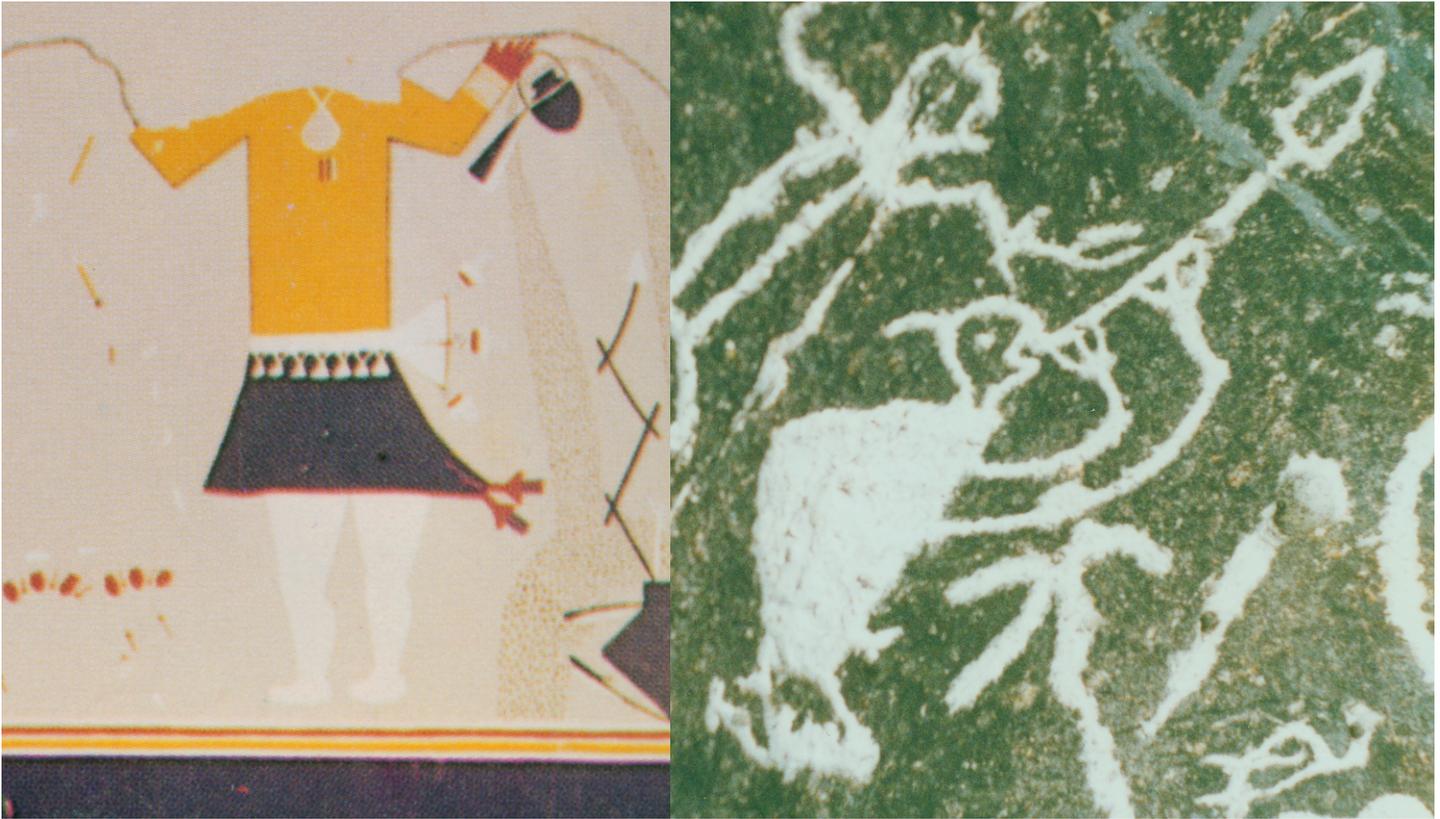
In my work, I classified objects as either tinklers or rattles, with tinklers being objects shaken against one another to produce sound, and rattles those composed of a vessel with rattling objects inside. I talk about the latter in a minute. Tinklers most often seem to have been sewn to the hems of clothing and viewed as ornamental as much as musical, or fastened to a stick or other handle to shake.



Shell tinklers are most often made from *Conus* shells like the ones shown on in the pot on the left. Usually, the spire was ground off and a hole for suspension was drilled through the tip at the other end. The one on the right was made by stringing *Pecten* shells on yucca cordage that was then bound with red-dyed cotton twine in such a way that no knots were visible.



Recent research by Ronna Bradley has shown that there were two coexisting prestige good exchange systems in the precontact Southwest. The Hohokam network lasted from about A.D. 1100 to 1450, and the Casas Grandes network lasting from the 12th century to the collapse of Casas Grandes around 1450. This should remind you of the two copper bell networks, and of course the Hohokam network is how all those shell trumpets got to the four corners area. With a few exceptions, all of the literally hundreds of shell tinklers that have been found in sites from the Casas Grandes network. Some of the exceptions include Casa Grande, Homolovi II, and Sityatki.



We know that shell tinklers were sewn onto clothing from many examples in kiva murals such as this one from Kuaua. They are worn by both male and female figures, as well as figures from mythology. There are no descriptions of them from the Spanish, and only one ethnographic description of them in use—that being one from Fewkes describing bandoliers worn during a Hopi Snake Ceremony at the turn of the century. While they are found archaeologically in many different contexts, there is one that is particularly interesting. The burial of a 40-year old man was excavated at Ridge Ruin east of Flagstaff. Tinklers were found along each leg, around each knee and around the right hand. It looks like these were sewn onto leggings or a kilt. The Hopi people assisting with the excavation felt that the other ceremonial objects found with the man meant that he was a person who would have performed a stick-swallowing ceremony such as the rock art figure here. This ceremony was meant to strengthen an individual or group in the fashion that a war leader or other such person would need, and people who could perform it held considerable status in their communities.



Hoof tinklers are the second most common tinkler type. They were made by stringing the hooves or dew claws of deer and antelope so that they would strike each other and make a rattling sound. The cord or thong would be passed through a hole in the tip of the hooves. Some were sewn onto the fringes of clothing, while others were tied to handles. Most are found in northeastern Arizona and northwestern New Mexico (though they were used in southern Arizona in the early part of the 20th century). Ethnographically, we hear of them sewn onto kilts at Hopi, and tied onto a crooked staff with bells at Zuni.



Most of the bone tinklers I've looked at are the bones of mammals with one or both ends ground flat and a suspension hole or holes drilled into the shaft. Most are jackrabbit tibias, but some are cottontail bones. The earliest ones are from around A.D. 700, and they continue through Pueblo IV. In the Rio Grande Valley, you see a lot more of them in Pueblo IV, and they seem to be part of the general ceremonial florescence of the time.



Nut rattles are rare in the archaeological record, perhaps because of the desirability of nut meat as food and their generally perishable nature. I only know of these two examples, both from Antelope House in Canyon de Chelly. They are both made of native Arizona walnuts ground flat on one end and strung together with yucca fiber. The one on the right is similar to the shell tinkler I showed you in that it was made so that no knots or cordage ends were visible—they were all tucked inside the wrapped handle.



Stone tinklers are also referred to as ringing stones. Some are unmodified splinters of rock like the petrified wood pieces at the top. Others were shaped and smoothed, as were the tabular ones on the bottom. Like other tinklers, stone tinklers were sometimes sewn onto clothing. The tabular tinklers on the bottom retain fragments of the yucca cord they were strung on, and they also have remnants of red ochre on them as if they were once painted or were worn by someone whose skin was painted with red ochre. Petrified wood tinklers are, not surprisingly, found in pueblos in the general area of Petrified Forest dating from Pueblo II though the contact period—including a few from Hawikuh. While petrified wood was traded widely, the tinklers were not; perhaps shell tinklers were preferable where they were available.



These are metal tinklers, which are quite rare. Some might be of prehispanic origin, but most appear to date to the period when European metal objects were available. The earliest ethnographic reference I know of is from Santo Domingo in the 1930s. Interestingly, they are described as sewn onto clothing in keeping with a long tradition of adornment. I also want to point out the resemblance between the metal tinklers shown here and the shape of *Conus* shells—shells are the quintessential tinklers.

There are two other kinds I don't have photos of. A set of wooden tinklers was found by Cummings in a cave in southern Utah dating to sometime before A.D. 1000. There may have been more, but of course wood is quite perishable. A very rare form of tinkler was noted by Spier among the Havasupai in the 1920s that would be even more perishable if made in prehistory—deer eye tinklers. The fluid from the eyes was drained, and

Rattles

...to mark time as they dance...

Frances Densmore



Rattles have a long history in the Southwest, and were made from a variety of materials, including gourds, turtle shells, leather, clay, and cocoons. Since most of these materials are highly perishable, I suspect that many more were made than my small sample suggests.



Gourds were one of the first domesticated plant species in the New World, and if left to dry intact, will rattle naturally. Some gourds are shaped such that there are natural handles, while others, like the one on the upper right, had a handle of wood, bone, or corncob. The seeds of the gourd could be used to make it rattle, but small pieces of clay, or pebbles could have been put inside. Sometimes the handles have survived even when the gourd did not. Of all rattles, gourd rattles seem to have been the most highly decorated. The ones that have survived that have been found range in date from Pueblo II to Pueblo IV, but this is probably the result of the perishability of the material and lack of use in earlier time.



These photos are the top and bottom of the same hide rattle, and you can see how the leather was stretched over a wooden frame and then gathered and tied. Pebbles or seeds would have been put inside. Other times pieces of hide were filled with sand and allowed to dry, then filled with seeds, pebbles, or shelled corn. Like gourds, these rattles are highly perishable and I only know of three—all from Sinagua and Salado sites in Arizona. What is interesting is that they are very similar to those used by some of the Hopi fraternities as late as the 1960s. Hopi migration stories claim that the Hopi lived in central Arizona prior to moving up to the Hopi mesas, and the rattles might evidence of a continuous ritual and musical tradition.



Turtle shell rattles can be constructed in two ways. Objects can be put into them so that the carapace serves as a container, or objects can be fastened to the outside so that they clatter against it—this latter is the most prevalent in the Southwest. The one at the upper left had the two halves of the shell bound together, and the hole through the middle probably accommodated a handle. While initially this looks like it would have had seeds or pebbles on the inside, there are other holes that suggest that, as in ethnographic accounts, deer or antelope hooves were strung on thongs and tied so that they would swing and clatter against the shell when it was shaken. The same is true for the other rattle on the lower right, though it did not have a handle. In ethnographic descriptions, such rattles were tied on people's legs near their knees so that they would rattle in time to their dance movements.

There are two kinds of rattling objects of clay. The first includes rattling mugs, ladles, and other such vessels which have a function separate from their sound production. Most of these are from the Mesa Verde area, though there are rattle-bottomed incense burners from the Hohokam area. The two halves of the mug shown on the bottom demonstrate how this would work. Small stones or balls of clay would have been in the small hollow in the bottom, and would have rattled when it was tipped. The second type are objects that had sound production as their main purpose such as the one on the upper right, and are quite rare—I know of only two. The one shown here was found by Kidder at Pecos, and he was quite unimpressed, writing that “as a noise-producer the implement is hardly a success”.





While at first glance this appears to be a drumstick, it is in fact a cocoon rattle. They are very rare in the archaeological record, probably due both to their perishability and to the limited distributions of appropriate species. There are two species that create cocoons appropriate for use this way. One is the trap-door spider, which makes silk-lined burrows underground. The other is the giant silk moth which spins cocoons. The rattle shown above with the handle is one way these rattles were made. Another was to insert a small pebble into individual cocoons and create strings of them to tie around the knees and ankles.



The only Spanish reference to a rattle is the story of the Spanish entering Hawikuh I've already told you. In contrast, there are many, many examples in the ethnographic literature of rattles in use. In general, rattles are associated with rain and fertility. There is also a Hopi story about a girl who had been kidnapped by Icicle Boy. She is helped by Old Spider Woman, who lives in a tiny hole in the ground that one can enter by climbing down a ladder as one would a kiva. While there isn't mention of a rattle in that particular myth, the connection between Old Spider Woman and cocoons might have lent some significance to the rattles. There are many examples of rattles visible in kiva murals; I've included this photo to show you one of the more clearly identifiable ones in rock art.



These are two examples of rattles on decorated ceramics; both are Mimbres vessels. The one on the left has been interpreted as a curing ceremony for a child. The second shows some rather fantastical creatures. Two appear to be humans wearing masks, and this has been interpreted as a mythical or ceremonial event.

Kiva Bells

...particularly harmonious sounds.

Hapka and Rouvinez



Kiva bells are lithophones—stones which produce a musical note when struck. They are found in many cultures worldwide, and there is a cave in Oaxaca known as the lithophone gallery with stalactites and stalagmites that have been used as percussion instruments for hundreds of years. There aren't any Spanish references to them, but we do have two accounts from historic times, one from Taos and one from Santa Domingo.



Most kiva bells are elongated pieces of limestone, basalt, phyllite, phonolite, feldspar, and similar materials and are usually a foot or more in length. The vast majority of them are found in late Pueblo III and early Pueblo IV sites in the Rio Grande Valley. Like the bottom photo, very few have any evidence of modification of their shape; most just show evidence of mild battering. Some had notches chipped in the side, probably to make it easier to suspend them. A few had remnants of red or yellow ochre, and two were decorated with an incised, interlocking diamond design, but these are exceptions rather than the rule. The one in the top photo is the only carefully shaped I know of. Many are found in groups, such as the ones on the previous slide, and some have been found in caches containing quartzite lightning stones, fetishes, flutes, and whistles, suggesting a ceremonial use. All known kiva bells date to after A.D. 1300, and are part of the general ceremonial florescence of the Pueblo IV time period.

Rasps

...abrupt, hollow, rasping sounds.

Parsons



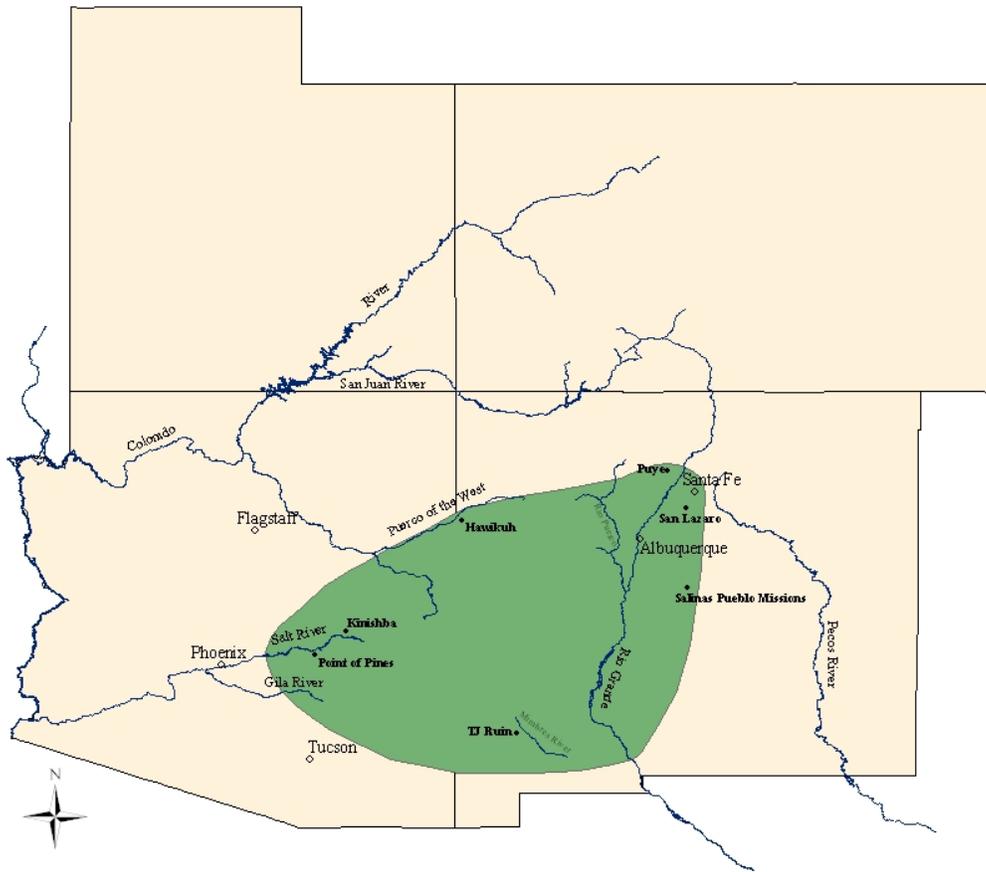
Rasps usually consist of two components—a serrated or notched object and a second, un-notched object that is rubbed across the indentations to produce the sound. In some cases the notched object can be as simple as an unmodified jaw bone, but wood, gourd, shell, or bone may also be used. In the Southwest, rasps are most commonly made of bone or wood. In ethnographic accounts, gourds and baskets were occasionally used as resonators, but these are hard to identify archaeologically, and the same is true of the rasps. One can tell the difference between a rasp and an object incised with marks for a tally because rasps show polish over the high points between the notches and nowhere else.



Most rasps were made of the scapulae of deer and antelope like the ones in the top photo. Others were made by notching the sides of ribs. Long bone rasps have notches cut into the sides of the shaft. The one on the left is the femur of a dog. Bone rasps have been found in burials, Great Kivas, and plazas from Pueblo IV sites.



Wood rasps especially seem to have been used with gourd resonators, and they were often rasped with the scapulae of deer or antelope. This is the only prehistoric wooden rasp of I know of, and it is from a Pueblo IV site near Point of Pines.



This map shows the distribution of the places raspas have been found, and they appear to be a post-A.D. 1200 phenomenon. Raspas appear to be closely associated with the kachina religion, though there are some examples of use in other contexts, such as bear bone raspas on the Walpi War Society altar. Often raspas are played by women, and there seems to be a conceptual connection between the action and sound of grinding corn and the action of playing a rasp. Some groups compare the sounds of raspas to the croaking of frogs, and associate them with moisture. Some raspas were decorated with cloud terraces or turtles or other animals—all associated with rain in some way. Others say the downward strokes are comparable to brushing away sickness, and so there is a curing function there as well.

Bullroarers

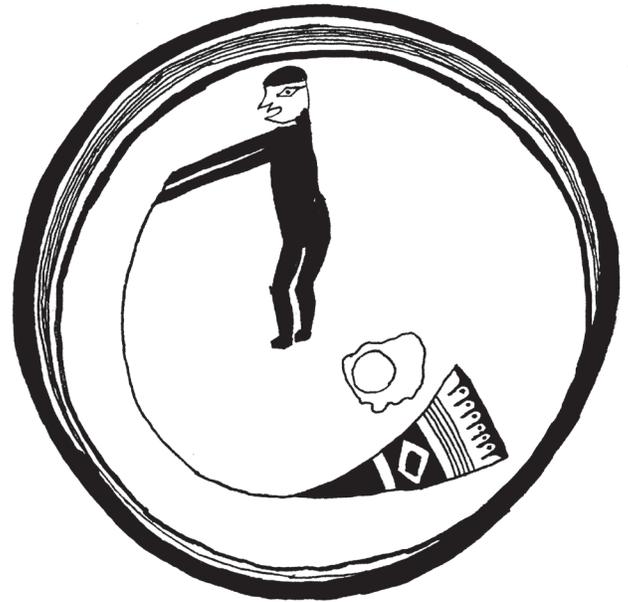
...the sound of a gust of rain-laden wind.

Fewkes



Most of you probably associated bullroarers with *Crocodile Dundee*, or at least with Australia. For those of you who aren't familiar with them at all, bullroarers are made by attaching a flat, narrow, elongated object such as a slat of wood to a cord and swinging it rapidly in a circle. The result is a humming or whirring sound. Most of what we know about bullroarers in the Southwest comes from ethnographic data, and the object in this photo is the only object that is even possibly a bullroarer I have come across. There are descriptions of bullroarers in use at Hopi, Zuni, Havasupai, and southern Arizona tribes at the turn of the century during pilgrimages to springs and for the purpose of creating wind to bring storm clouds. There is even a Hopi deity who is said to carry a bullroarer. He has a single horn in the middle of his head, and is associated with the horned serpent and the Kwan Society, and thus with warfare and hunting as well a fertility and life. There are a few references to use among the western pueblos and Apache, but they are less frequent.

This Mimbres vessel is the one example of a bullroarer in visual art, and it lends some credence to the antiquity of the instrument even if examples are lacking in the archaeological record. Unfortunately, there is little information aside from the apparently male gender of the human figure that gives us any information on how they were used at that time.

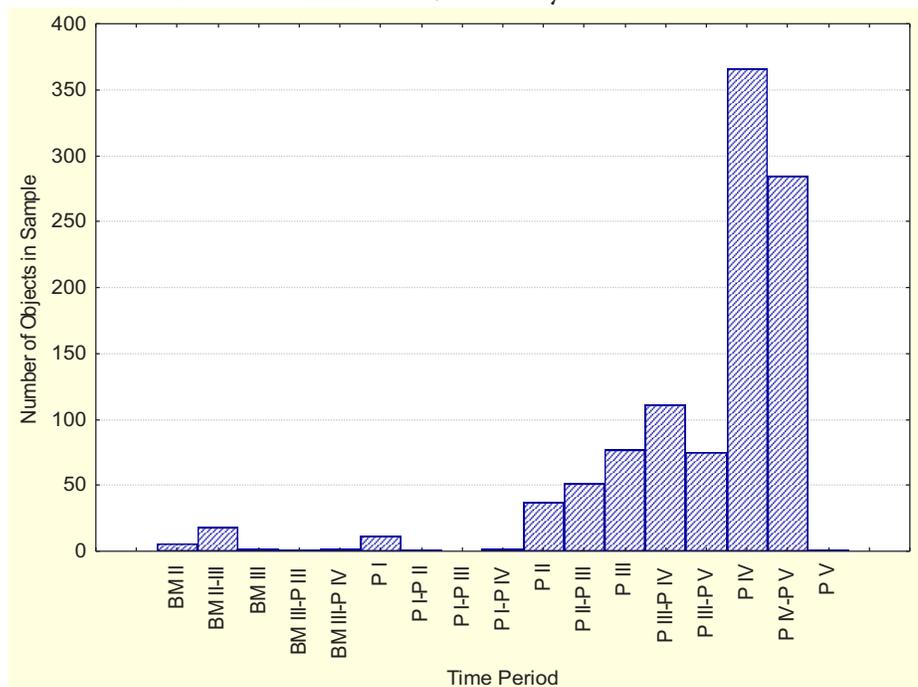


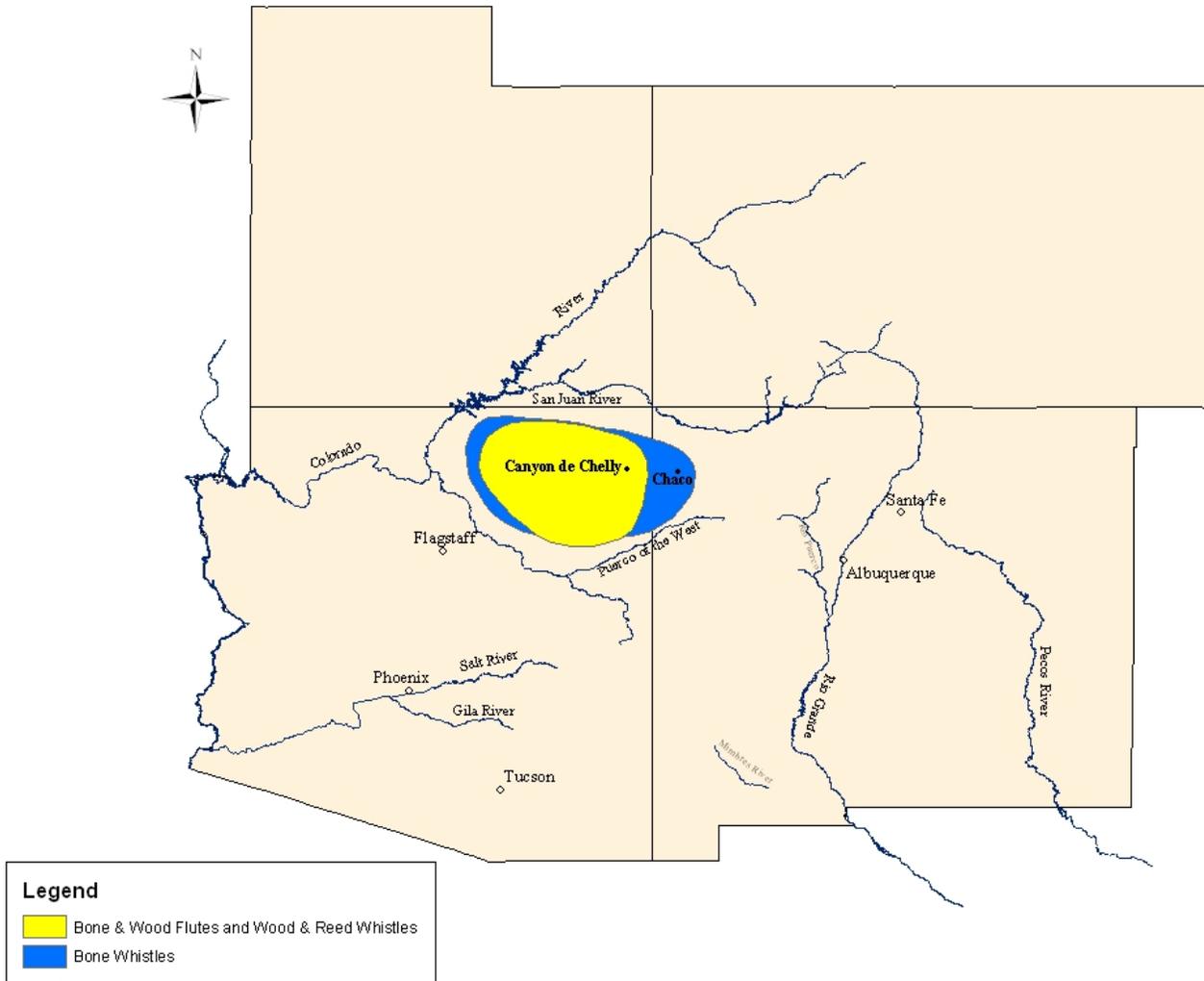
A lot more information on bullroarers is needed, and because they aren't used in Western music, it is possible that many go unrecognized by archaeologists unfamiliar with them. While initially they seem associated with the kachina religion, ethnographically they are more often used by members of certain kiva fraternities than by individual kachinas, and thus they might be associated with ceremonies of greater antiquity. Common to all accounts, however, is their use by men in positions of power and a symbolic connection with storms, lightning, moisture, fertility, snakes, and wind.



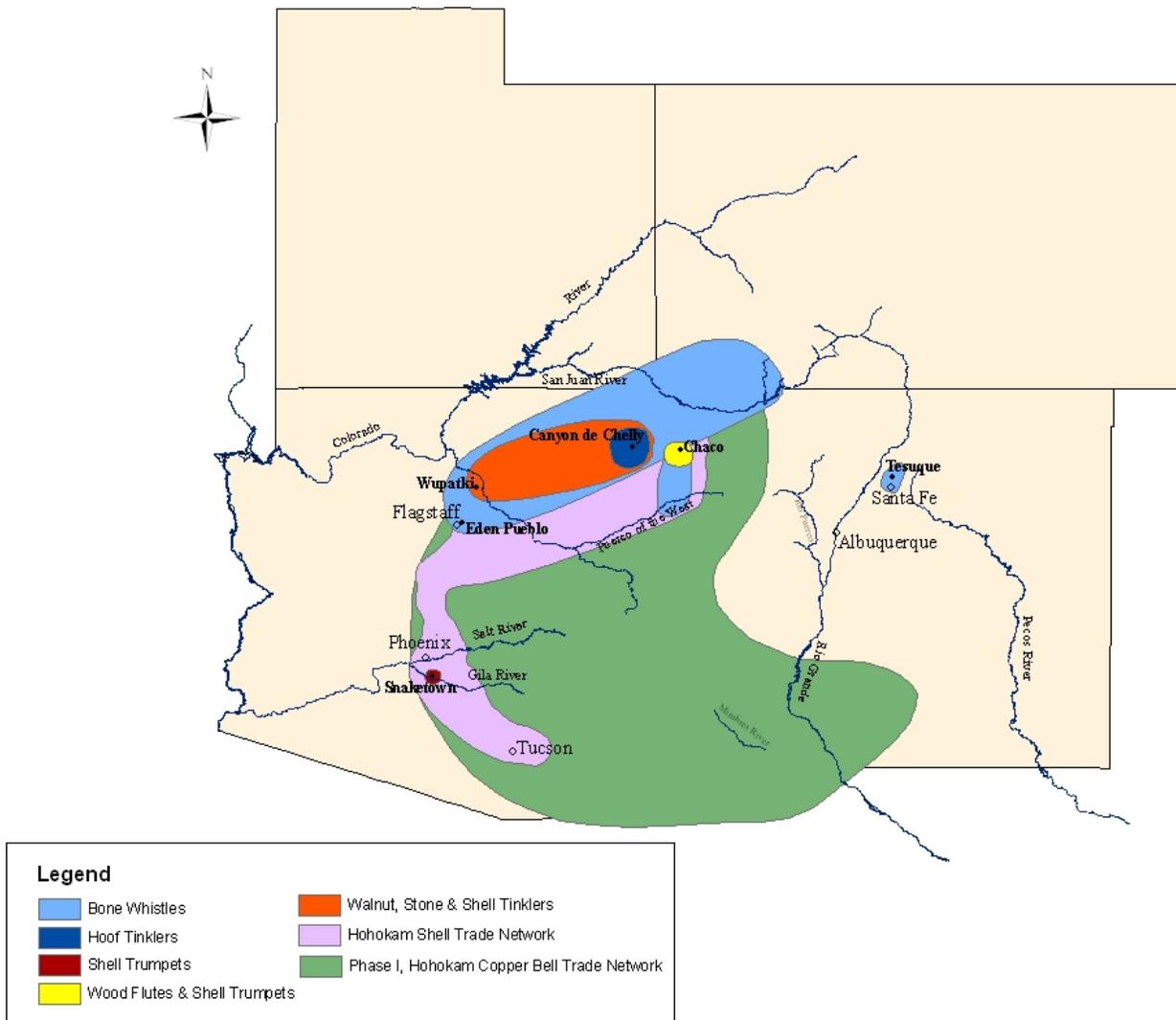
Now I know it can be hard to get a cohesive picture when presented with all this information instrument by instrument. This all becomes more relevant when you consider what can be concluded about significant change in social and ceremonial practices by looking at distributions of musical instruments. While not every political event was ceremonial, there is nevertheless compelling evidence suggesting that religious and political authorities were often one and the same, and that people with the right and responsibility to conduct ritual performances were often the people with influence in other areas of society. So now, a brief synthesis.

I promise not to inflict too many graphs upon you this far into the lecture. What I mostly want you to notice is how few instruments we know of from earlier time periods versus what we see in later periods, especially Pueblo IV.

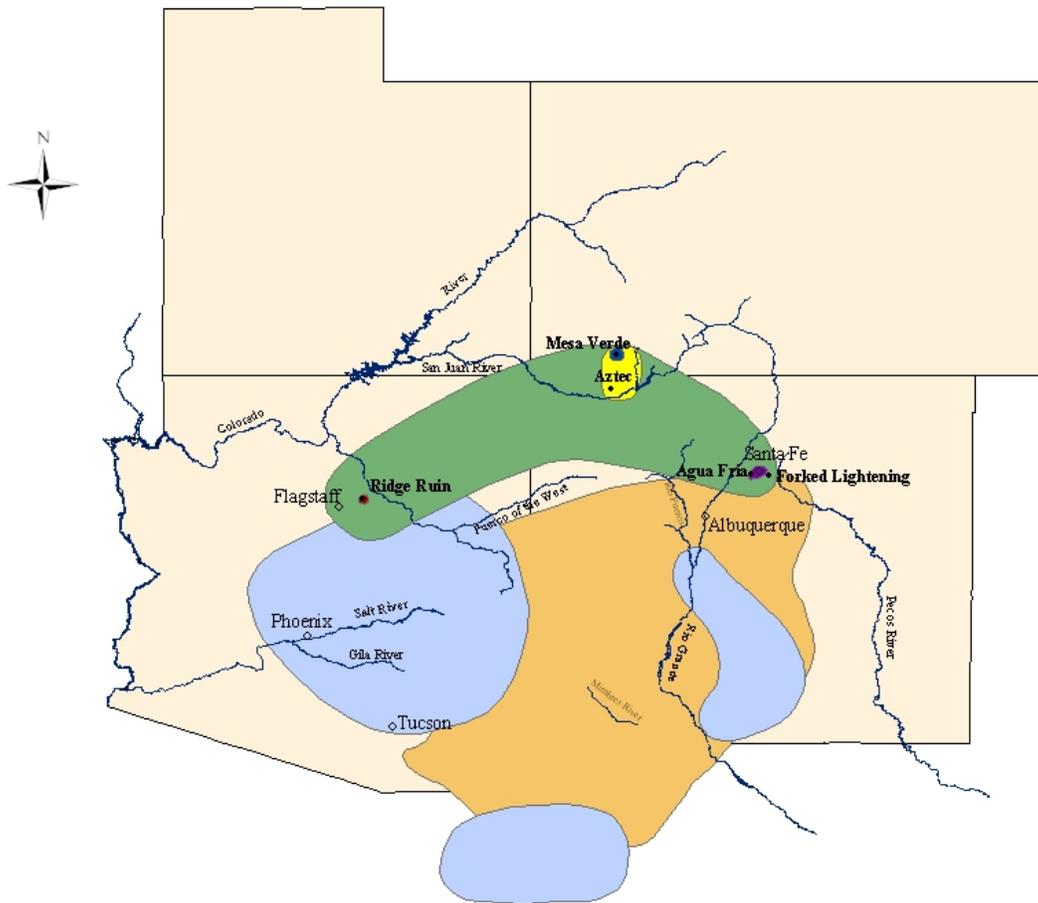




This is a map of Basketmaker instruments. As you can see, the ones we have found come mostly from northeastern Arizona, where there are dry alcoves that make for great preservation of perishable materials. So this cluster may represent a regional tradition, or it might be that instruments were more widespread and simply haven't survived in areas with less protected sites. Now we know from rock art and effigy figures that birds were important in Basketmaker culture, and we also know that Basketmaker peoples were only newly reliant on agriculture and we might expect their hunting tool kits to be well developed. I think that many whistles were used as calls for turkey and other game, both in the context of actual hunts as well as in ceremonies seeking to ensure an abundance of game. The flutes are quite interesting, because they are actually some of the most musically sophisticated instruments in the whole precontact Southwest and are probably part of a tradition beginning in the Archaic, if not Paleo-Indian periods. On the basis of this complexity and on images on rock art, it is reasonable to suggest that flutes were made and played primarily by men who were shamans or were otherwise responsible for aspects of the ceremonial lives of their communities.

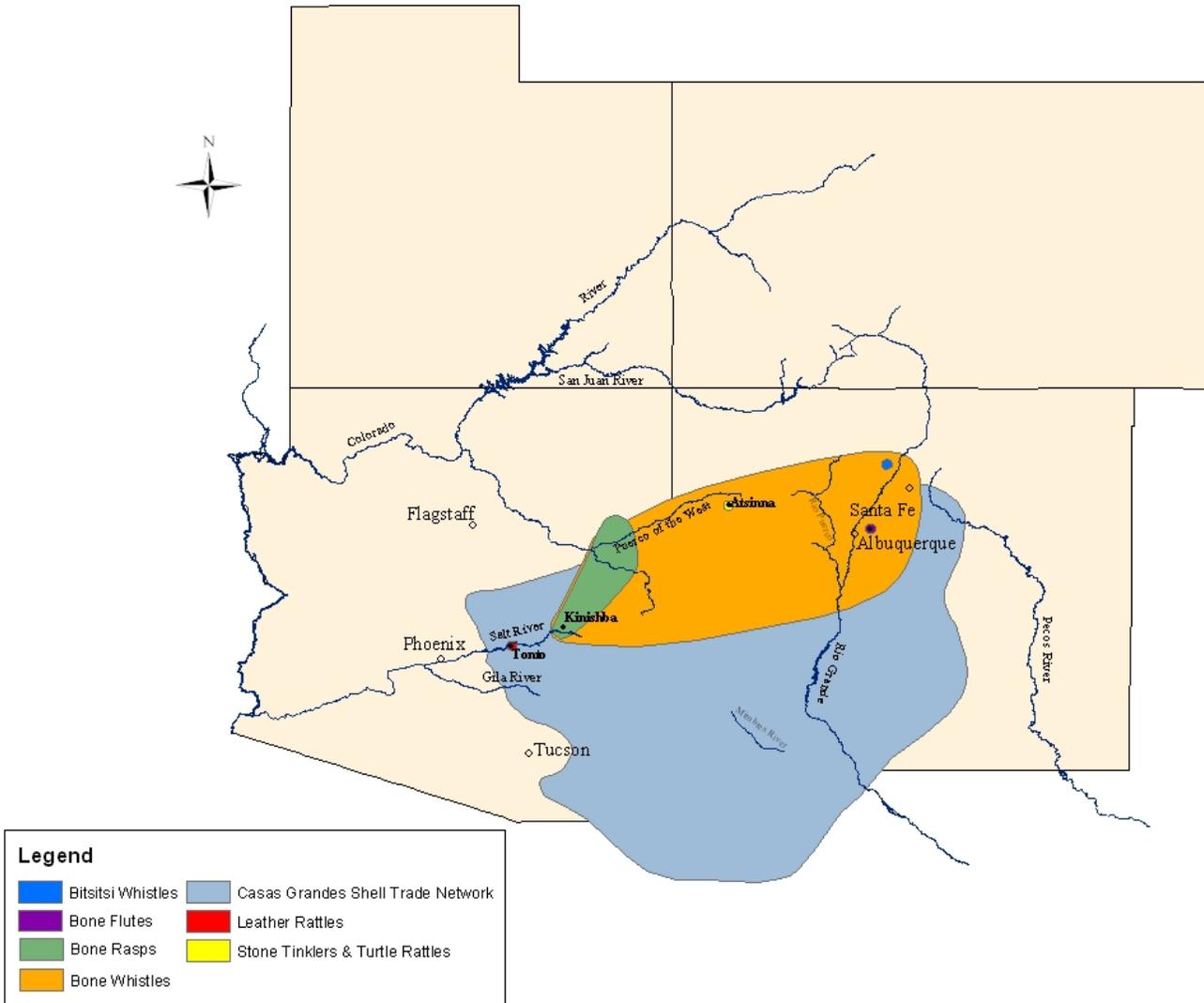


I'm going to skip to Pueblo II here because my sample from Pueblo I is really small—eight whistles, three bone tinklers, and a series of possible foot drums. This is probably due to the way archaeological research on Pueblo I sites has been conducted more than a lack of instruments, because there is a lot of continuity between Basketmaker III and Pueblo II, with the addition of copper bells, shell trumpets, and shell tinklers coming up from the south. The wooden flutes from Chaco were made and played in the same fashion as earlier ones, and there is still evidence of foot drums. What is interesting about Pueblo II is that this is the first time in which certain instruments were traded over great distances as luxury items, and it is also the time for which there is the strongest evidence for an institutionalized religion—complete with priestly figures that appear to have used musical instruments as one means of creating a ritual atmosphere for their ceremonies. If you compare the variety of objects from Chaco as opposed to contemporaneous settlements, it is clear that the greatest musical variety and elaboration was taking place in the context of Chacoan Great Houses in the heart of Chaco Canyon itself.

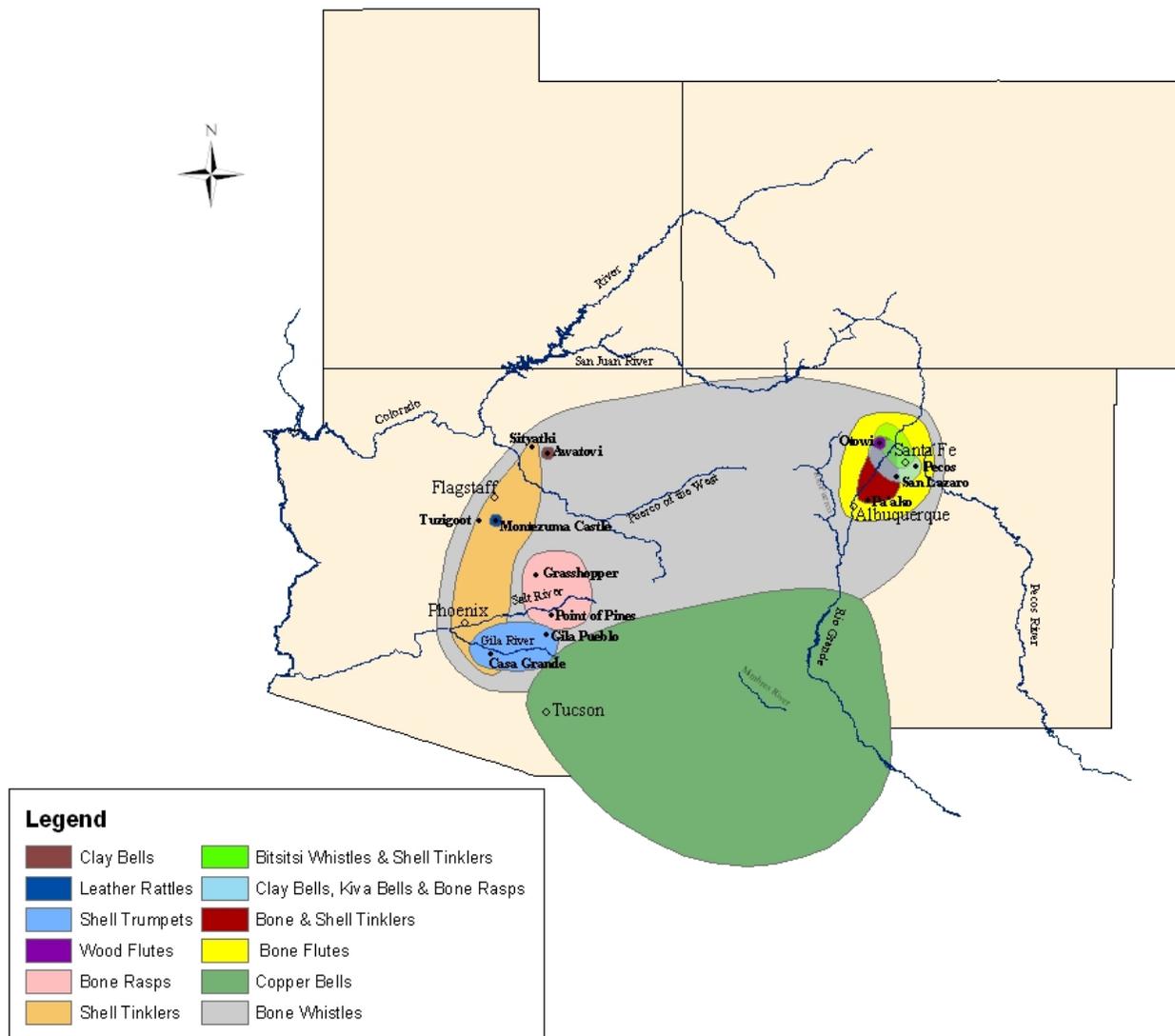


Legend	
■ Bitsisi Whistles & Clay Whistles	■ Bone Whistles
■ Cocoon Rattle, Shell Tinklers	■ Phase II, Hohokam Copper Bell Trade Network
■ Wood Flute	■ Casas Grandes Shell Trade Network
■ Rattle Mugs & Ladler	

I'm going to separate Pueblo III into two parts. Early Pueblo III is dominated by the collapse of Chaco and a great deal of migration, while in the Rio Grande in Late Pueblo III, people were beginning to gather in large pueblos. While you still find trumpets and copper bells, they occur only in more southern sites, and wooden flutes disappear altogether. It is possible that they were no longer played because Chacoan rituals were perceived as flawed in their failure to alleviate the extreme drought conditions of the time. It also possible that as populations dispersed, religious societies disbanded, and perhaps no one could afford to procure expensive trade objects and sponsor large-scale ceremonies.



What happens outside of Chaco is that instruments associated with local musical traditions such as tinklers, rattles, and whistles increase exponentially. The first bitsitsi whistles appear, the first bone flute, the first kiva bell, and the first rasp. Most are found in areas that remains habitable during the long drought and saw increases in population as people left other areas. With the exception of shell tinklers, none of the instruments from Late Pueblo III were luxury trade items, and they are all relatively easy to play. This suggests that if these instruments were used ritually, they were much more inclusive in that more people could actually have participated in making music rather than just watching others do so. This is not to say that there weren't ceremonial specialists, and what appears to have happened is that revised or entirely new religious belief systems that began in Pueblo III reached their full flowering in Pueblo IV.



Most researchers agree that the kachina religion arose in the early 1300s, though the beliefs associated with it seem to be superimposed over an earlier theocratic system to varying degrees in different places. Ritual seems to be used for communication more than ever before, and this is reflected in the numbers of musical instruments. Many of the instruments first appearing in Pueblo III are present in greater numbers, and there are new instruments such as clay bells, even as foot drums all but disappear. So while not every instrument was exclusively ceremonial in use at any time in prehistory, it is interesting to note that the greatest variety and highest numbers of instruments correlate very well with the height of Chaco, the height of the Hohokam (which I didn't have enough time to talk much about), and with the rise of the kachina religion in early Pueblo IV.