

Chapter 7

Ethnohistorical sources in archaeoacoustics research: A case study from South-Central California

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Abstract

This article explores the use of ethnohistoric data for the understandings of the acoustic and sound-world of rock art sites. A discussion on the complexities of using ethnohistorical documents in the study of rock art and archaeoacoustics is made using Yokuts rock art as a case study. The analysis follows five lines of evidence: the placement of rock art, first, in sonorous landscapes and, second, in places with “special” acoustics; the representation of musical practices and sound-producing instruments; the evidence of musical instruments in the period under study and, finally, the production of rock art at or near lithophones. It is concluded that critically reading ethnohistorical sources may reveal conceptual inadequacies when approaching the cultural understanding of sound in other cultures and assist the research questions followed in fieldwork. Finally, the analysis of ethnohistorical sources makes archaeoacousticians undertaking fieldwork aware of possible sites and lines of research that could be sensitive and/or restricted to certain members of the society involved.

Keywords: archaeoacoustics, rock art, ethnohistory, Yokuts, California, landscape, sound, music, musical practices, lithophones

Introduction

In 1998, Paul Taçon and Chris Chippindale distinguished the study of rock art based on formal methods from analyses that followed informed methods. Formal methods refer to the systematic measurement and evaluation of a set of features without the assistance of ethnographic knowledge. In contrast, informed methods require cultural knowledge of the art acquired through insights “passed on directly or indirectly from

those who made and used the rock art” (Taçon and Chippindale 1998, 6). The division between formal and informed methods, however, is not as clear-cut as it seems. On the one hand, the interpretation of the results of analyses based on formal methods is, more often than not, inspired by ethnographic sources. This is because they may provide clues on how to culturally interpret rock art sites and/or landscapes. On the other hand, as Taçon and Chippindale acknowledged, there are only a few rock art traditions that continue into the present and the ethnographic information on them is scant (Morwood and Hobbs 1992; Keyser *et al.* 2006; Blundell *et al.* 2010). Therefore, it could be said that the analysis of rock art areas where informed methods are possible thanks to knowledge obtained “through ethnography, through ethnohistory, through the historical record, or through modern understanding known with good cause to perpetuate ancient knowledge” (Taçon and Chippindale 1998, 6) may often require to be assisted by formal methods of analysis.

In the last two decades archaeology has experienced a renewal in the way past communities are examined. In rock art studies this has led specialists, among others, to an attempt to go beyond materiality and recover less evident and intangible cultural signs such as those related to the senses, including hearing. This is because pre-industrial societies around the world give special importance to places where distinctive acoustic effects are generated. As some ethnographic sources hint, these sonorous places are ontologically related to supernatural beings and embedded with agency (for examples of this and a global overview on this see Díaz-Andreu *et al.* 2021, 3–14). Formal and informed methods are two perspectives to be used in the analysis of the relationship between sound and rock art (Rainbird 2002; Waller 2005b; Devereux 2008; Lahelma 2008; 2010; Loose 2008; Waller and Arsenault 2008; Zawadzka 2011; Arsenault and Zawadzka 2014; Äikäs 2015). In some areas, historical and ethnohistorical sources are unavailable and formal methods are the only way to assess the extent to which acoustics and soundscapes were at all relevant for the location and creation of rock art (Díaz-Andreu *et al.* 2021, 14–18).



Fig. 7.1: Map of the Yokuts ancestral area, with indication of where the site of Rocky Hill is. Author's own elaboration.

Nevertheless, other rock art traditions are today (or they were until very recently) lived and experienced by populations culturally connected to those who created the depictions. Thus, insights about the relationship between landscapes and acoustics can be traced both in ethnohistorical sources and in recent ethnographies.

In this article we present our informed analysis of the ethnohistorical sources on the different Yokuts tribes of south-central California in terms of how these sources can shed light on archaeoacoustics inquiries. In particular, we will refer to the area where acoustical fieldwork is planned under the auspices of the Artsoundscapes project (www.ub.edu/artsoundscapes).¹ This will be undertaken in the Rocky Hill area near Exeter, California. In this boulder-strewn hill (Figs 7.1 and 7.2) paintings are located in alcoves, shelters and caves. In them a series of polychrome painted motifs in red, black, white and yellow/orange are found (Fig 7.3). Figures include anthropomorphs, zoomorphs and geometric shapes (Whitley 1996, 158–159). The presence of riders and cattle indicates that, at least in some cases, the art was produced during the historic period (Grant 1981, 23). The central role of Rocky Hill for local Yokuts meant that, despite being privately owned for the last century or two, its ritual use continued. As Whitley explained, for the Yokuts “the pictograph motifs not only represent supernatural spirits symbolically, but are themselves sacred objects in a concrete sense” (Whitley 1996, 160). Sites excavated in the area are dated from 300 CE (Robinson 2006, 94).

The ethnohistorical sources referring to the different Yokuts tribes cover a period related to the final years of the 19th century and the early decades of the



Fig. 7.2: A view of the Yokuts ancestral site of Rocky Hill (Exeter). Acquired in the historical period by Euro-American settlers (Whitley 1996, 159), a portion of Rocky Hill was bought in the 1990s by the NGO The Archaeological Conservancy (TAC). Yokuts tribal members have continuously used the site and, moreover, tribal knowledge about the rock art panels has been passed through generations (*ibid.*). Photo by David S. Whitley, reproduced with permission.



Fig. 7.3: Rocky Hill. Panel. Photo by David S. Whitley, reproduced with permission.

20th century. Despite their shortcomings, we argue that these sources may be helpful to inquire into how rock art may have been entangled with Yokuts soundways, i.e. “the paths, trajectories, transformations, mediations, practices, and techniques – in short, the ways – that people use to interpret and express their attitudes and beliefs about sound” (Rath 2003, 2; 2008, 419). We begin below by reflecting on the use of ethnohistorical sources as a methodological tool for rock art research. We discuss some of the approaches to sound, song and landscape that can be found in Yokuts historical ethnographies, and finally, we relate these findings to Yokuts rock art following the five lines of evidence connecting rock art and acoustics proposed by Díaz-Andreu and Mattioli (2019).

The use of ethnohistorical sources on Yokuts’ rock art sites

Rock art researchers have widely engaged with both the advantages and problems of taking into consideration ethnographic and ethnohistorical accounts (e.g. Lewis-Williams 1981; 1991; Huchet 1991; Morwood and Hobbs 1992; Solomon 1998; Taçon and Chippindale 1998, 6–7; Bahn 2001; Quinlan and Woody 2003; Keyser *et al.* 2006; Bednarik 2010; Francis and Loendorf 2010; Whitley 2010; Blundel and Woolagoodja 2012; Layton 2012; Pearce 2012; Gillete and Greer 2014; Rozwadoski 2018). In general, these informed methods (Taçon and Chippindale 1998) are considered to be one of the few methodological tools that may provide interpretations of the production, meaning and use of rock art. However, their benefits have been questioned. The main criticisms of this approach are both the apparent implicit denial of cultural change and the defective nature of the ethnographic record. The first concern is closely related to a perceived necessity to recall the ethical problems of 19th-century evolutionistic approaches to non-Western cultures. However, researchers who use informed methods in areas where rock art is still being created (or was until recently) and where a certain cultural continuity is accepted, argue that their perspective does not dismiss cultural change, but simply offers a selection of available sources that may indicate a possible continuity in a particular cultural manifestation, even if change can be demonstrated in other aspects (Bundell *et al.* 2010, 4; Whitley 2010; Pearce 2012). Some authors have even claimed that, in the light of diverse ethnographies, conservatism is not uncommon among traditional societies, particularly regarding ritual and religious beliefs (Whitley 2010, 124). In this respect, Pearce (2012, 141) has stated that both change and continuity must be demonstrated and not simply assumed.

Many voices have called for a critical approach to the historical sources. For instance, Vinnicombe (2010) alerts us to the imposition of Western narratives on fragmentary emic information. Likewise, Monney and Baracchini (2017) acknowledge the need for both a critical analysis of the sources and an awareness of the diversity of the records, including the different ontologies and epistemologies involved. Several others such as Brady *et al.* (2019), Monney and Baracchini (2019), Rogers (2007) and Sundstrom (2012) also underline the problematic contexts of ethnographic

compilations and the bias in the type of materials selected by ethnographers. These authors have also highlighted scholars' subjective interpretations based on problematic translations or on western-centric paradigms such as gender binarism. Moreover, they have been pointed out that female individuals and female narratives are scantily represented in the ethnographic sources, due to both the gender and the mind-frame of the early anthropologists (especially Rogers 2007). Finally, multiple meanings and multivocality within the communities that hold the traditional knowledge are a last challenge for those willing to use ethnohistorical sources to interpret rock art (Rogers 2007; Sundstrom 2012, 331; Brady *et al.* 2019; Monney and Baracchini 2019). Nonetheless, ethnographic information must be reported and carefully considered, as the uncritical denial of any kind of cultural continuity not only undermines native epistemologies and oral histories, but also expropriates indigenous peoples from their cultural heritage and historical narratives (Whitley 2010, 126–127).

The criticisms highlighted above are relevant to our own survey of ethnohistorical sources on the Yokuts cultures, as the texts we have dealt with are “deeply marked by the historical, cultural, and relational conditions in which they were recorded” (Monney and Baracchini 2017, 536). Most of these documents were authored by salvage anthropologists in the early 20th century (Kroeber 1907; 1925; 1939; Gayton 1928; 1929; 1930; 1945; 1948a; 1948b; Gifford 1932; Driver 1937; Aginsky 1943; and the Harrington papers now in the Smithsonian produced between 1914 and c. 1957). They were written in the context of Euro-American internal colonialism and were, therefore, produced under unequal power relations. Moreover, on top of influencing who, where and what was recorded as representative of Native California, salvage scholars also guided the choice of the medium and the audience for which materials were compiled. Tribal stories, songs, languages and dances, among others, were put onto paper, first as fieldnotes and then as organised, analysed, compared and theorised information, for a mostly Euro-American academic audience (Kroskrity 2013, 150). Consequently, as is well known, salvage anthropological sources need to be read critically. This entails taking into account their particular approach to ethnographic representation, including, firstly, the exclusion of the present of the Native American people portrayed in their texts, and secondly, their exclusive focus on Native American memories, material objects and cultural practices that were deemed able to convey “purely aboriginal” knowledge by salvage anthropological standards (Lightfoot 2005, 31; Clifford 2013, 170).

Salvage anthropological sources constitute an important body of literature despite the romanticised and static representation of pre-reservation life highlighted above. On the one hand, Native American tribal members, including the five Yokuts tribes that presently constitute the Central California Yokuts NAGPRA Coalition, are using some of these documents (i.e. the fieldnotes taken by John P. Harrington) in their cultural and language revitalisation programmes. Moreover, the Tejon Tribe, a constituent of the above-mentioned Coalition, has used these fieldnotes to claim

expropriated ancestral lands (Whitley pers. comm. January 19, 2021). On the other hand, ethnohistorical sources have played an important role in the construction of knowledge regarding different historical and archaeological aspects of Native California. In fact, as archaeologist David Robinson pointed out (2006, 21–34), since the mid-1970s archaeologists have used ethnohistorical documents to interpret California rock art (see for instance Bean and King 1974; Blackburn 1975; Hudson and Lee 1984; Whitley 1992; 1994; 2000a; 2000b). These documents provide evidence concerning aspects of the meaning, creation and use of Yokuts rock art, along with place names and terminology related to Yokuts rock art sites (Whitley and Whitley 2012, 258).

Ethnohistorical documents become a valuable research resource when they are cross-referenced with ethnographic, archaeological and geospatial research (Robinson 2006, 34). Nevertheless, the critical reading of published sources must be complemented with archival work and close collaboration with Native American tribal members. Archival research, i.e. reading salvage anthropologists' field notes, field diaries and other unpublished manuscripts should constitute an important step in the revision of salvage anthropological texts in the context of Californian rock art research. Even more important is the collaboration and corroboration with Native American tribal members as both experts on their own cultural practices and histories and as gatekeepers of sacred knowledge unveiled in salvage anthropological materials, but meant to be accessed exclusively by certain tribal members at specific moments and through particular processes (Whitley 2007). This is also important from a wider perspective, especially if one considers that “the future archaeological practice in the U.S. – and many other parts of the world – will be partly based on indigenous knowledge, influencing how we identify and assess sites, how they are managed, and how we interpret their meaning” (Whitley 2007, 8). After all, there is a difference between the consultation of indigenous sources, and indigenous archaeology as a decolonising practice in which indigenous people take part in the archaeological research process (Atalay 2006).

Yokuts rock art, archaeoacoustics, and the ethnohistorical record

In this section we will look at the “lines of evidence” linking rock art and acoustics first proposed by Díaz-Andreu and Mattioli (2019) for the case of Yokuts rock art. These lines of evidence included:

1. the placement of rock art in “naturally sonorous landscapes”;
2. the placement of rock art in landscapes where artificially produced sounds, including human musicking, could be perceived to have exceptional acoustic responses;
3. the representation of musical practices and objects in rock art;
4. the presence of sound and musical objects at rock art sites; and
5. the production of rock art at or near lithophones (Díaz-Andreu and Mattioli 2019, 503).

Our initial ethnohistorical survey has provided examples of most of these points of connection.

The archaeological study of such a link between rock art and acoustics is not new. In North America the relationship between rock art and acoustics was first noted in academic archaeological contexts by Jack Steinbring (1992), when he mentioned that there were “doubtless hundreds of sites which invoke unusual sound patterns, or present conditions in which sounds may give striking effect” (1992, 103) citing a few examples in Canada and Wisconsin in the US. Also Ken Hedges (1993) concluded that the existence of rock art in ringing rocks illustrated an unusual feature of petroglyph sites, which adds another dimension to our understanding of rock art. Clearly, senses other than the visual were at work. First of all, there is the rhythmic and tactile experience of making the rock art itself. The ringing rocks show that an auditory component might also be significant in the production of rock art, and that these sites often have many layers of understanding that may be overlooked, awaiting casual discovery of features of the site that are not in the least obvious upon initial examination (Hedges 1993, 124).

Since the 1990s the link between rock art and acoustics, especially echoes, has become the focus of Steve Waller’s research, producing a series of publications about ethnographic and historical sources for echoes and the results of his own fieldwork in archaeoacoustics mainly in the United States. These pioneering authors were later joined by an increasing number of scholars. Most comments refer to isolated sites, although the study of rock art landscapes has also been undertaken in Deer Valley and Box Valley in Arizona (Waller *et al.* 1999), Horseshoe Canyon and other sites in Utah (Waller 2000; 2005a; Allan and Waller 2009), Petroglyph National Monument in Albuquerque, New Mexico (Waller 2003), Colorado (Williams 2012) and the Mojave Desert (Liwosz 2014; 2017) (see also Patterson Rudolph 2000; Loose 2008). Most of these authors link the perception of the acoustics of rock art places to religious practices and beliefs, particularly shamanism, and mention some ethnohistorical sources, although in most cases their use has lacked depth (however, see Whitley 2010).

Two notes before we delve into how the “lines of evidence” may reveal new information about Yokuts rock art and acoustics. The first of them is that so far in our survey of early 20th-century ethnohistorical sources on the Yokuts tribes, we have seen that salvage anthropologists tended to impose Euro-centric concepts and ontologies on sound and music when dealing with Native Californian cultural practices. Moreover, indigenous listening positionalities were not at the centre of their concerns. However, their overall focus on documenting Native American rituals and religious beliefs allowed for some issues pertaining to Yokuts soundways to emerge in their scholarship (Alarcón-Jiménez and Díaz-Andreu 2019).

Moreover, it is important to note that early 20th-century Yokuts sonic ontologies and epistemologies were not conversant with a clear division between naturally and artificially produced sounds. Songs, for example, could be learnt from different entities such as lakes, the wind, birds, or fellow human beings (Harrington, Reel 89,

Image 176). Furthermore, songs could not only be acquired from other-than-human-beings, but they were also heard by them. Indeed, salvage anthropological accounts of different Yokuts tribes referred to personal, ritual or ceremonial practices to control (e.g. rattle snakes) or to communicate with different beings through singing and dancing. With or without their agency, animal sounds also mediated communication processes between humans and other-than-human-beings. This was the case of the birds from “Wóluluqaj, (...) down south of (...) Tsunut ot Wowol country”, who could share the landscape’s songs with certain individuals (in Harrington, Reel 101, Image 174), or the human beating of a dog to make it cry and stop the rain (Gayton 1948a, 158). Other-than-human-beings not only sounded, sang and responded to singing but some of them also talked. Within the framework of Yokuts’ creation stories, certain animals, such as specific bears and birds, were classified as “people” and spoke phrases in Yokutsan languages. For example, frogs said *pono’j ‘ilik*’ (meaning “two waters” in Chunut Yokuts), according to Yokuts tribal member Josefa Damián (of Chunut and Wowol descent) (in Harrington, Reel 91, Image 146). All in all, the division between sound/song, soundscape/landscape and artificially/naturally produced sounds must be reframed in this context. Moreover, it should be taken into account that sources such as Harrington’s fieldnotes also reveal the complex and conflicting relationship between different religious powers and belief systems that were present in south-central California in the first decades of the 20th century. A brief but telling example about this is found in the testimony of Yokuts tribal member Francisca Lola who, after being baptised by a Catholic priest, lost the ability to dream and bond with dream helpers and thus ceased to learn songs from them. Following her baptism, she was only able to dream with people who had passed away (in Harrington, Reel 89, Image 970).

First line of evidence: The placement of rock art in sonorous landscapes

Yokuts tribal members considered rock art sites to be powerful (Whitley 1996; 2000; 2020; Hector 2009; Robinson 2013) and therefore sonically salient. According to the Yokuts knowledge represented in ethnohistorical sources, the sense of hearing played a central role in the identification of certain locales in the landscape as powerful, “sacred,”² or, in the Tachi-Yokuts language, *tripni*. In Harrington’s fieldnotes, for instance, Yokuts tribal members characterised certain mountains, rivers, lakes and ponds as particularly *tripni* as they either talked, embodied stories, sounded out or sang/had songs on them (Alarcón-Jiménez *et al.* 2021). Particularly *tripni* places and topographic features such as rock art sites could be heard and sensed by Yokuts ritual specialists and other tribal members. It is important to highlight here that the contrast between the Yokuts and the Euro-American settlers’ sensorium – in other words, the ontological difference between these cultural realms – had already been brought up by the aforementioned Francisca Lola in the first decades of the 1900s: “why the Indians see so many *tjr’ip’ni* [*tripni*] things and the Gringoes [*sic*] never see anything like that. (...) Maybe it is because the Gringoes [*sic*] are not afraid of anything and always want to investigate” (in Harrington, Reel 94, Image 329).

Yokuts rock art sites, like other salient tripni features and places, were thus perceived as sonorous points in the Yokuts ancestral territories. In a few instances they were specifically portrayed as sounding hollow and being guarded by both visible and audible other-than-human-beings. This is related to at list one type of practice. As the ethnohistorical and ethnographic evidence suggests, at least some Yokuts rock art sites were painted by ritual specialists. Furthermore, they were used as caches to hide personal valuable items like money and ritual regalia (Gayton 1948a, 113; Whitley 1994; 1996; 2000; and Harrington, Reel 94, Image 616). Regarding the hollow sound, Yokuts tribal members Sam Garfield and Mary Pohot (of Wukchumni descent) described a rock art site in Bell Bluff, presently under the waters of the Terminus Dam, as sounding “different” when stepping on it; they told anthropologist Anna H. Gayton that large rooms, only accessible to ritual specialists, extended within the rock (Gayton 1948a, 113). They also referred to other-than-human-beings guarding the site, which was therefore avoided and feared (*ibid*).

Second line of evidence: The placement of rock art in places with “special” acoustics

The placement of rock art in landscapes where sonic and musical practices could be perceived as having “exceptional acoustic responses” (Díaz-Andreu and Mattioli 2019) refer to acoustic effects such as echoes, resonance and reverberation, none of which are addressed in the ethnohistorical sources consulted. While further ethnographic research and formal archaeoacoustics tests are needed to inquire into these issues in the context of Yokuts rock art, it could be argued, however, that the perception of the acoustics of certain Yokuts rock art sites was probably “enhanced” in the context of some rituals and healing practices, as a consequence of altered auditory perception. Ethnographic and archaeological research suggests that certain “quests” and healing practices took place at Yokuts rock art sites like Rocky Hill.³ Furthermore, ethnohistorical documents highlight the importance of processes such as song acquisition, singing and/or dancing (including bodily percussion movements) for questing and healing, although without specific references to rock art creation, rock art use or rock art sites (see, for instance, Gayton 1928, 32–33; 1948b, 15; Driver 1937, 103, 7). However, a mix-methods approach can be used to link these different kinds of evidence and thus to infer that singing and perhaps also dancing took place at rock art sites during these processes. Along these same lines, it could be further argued that musical and other sound-related practices were perceived to have “exceptional acoustic responses” at rock art places as questing and healing rituals developed. This is because, as the ethnohistorical sources point out, quests involved a disciplined bodily process of fasting, cold bathing and induced dreaming brought on by, for example, the ingestion of the hallucinogenic plant *Datura* (Gayton 1948a, 114, 108–109; 1948b, 150, 158, 173; Robinson *et al.* 2020). The altered state of consciousness resulting from the questers’ preparation of their bodies would surely have influenced their auditory perception of the sites where the rock art was already placed or was about to be painted. The same could be

argued, to a certain extent, for the healing practices that took place at rock art sites (Whitley 2020), as the illness in question may also have altered human auditory perception. Hence, in both contexts, music at rock art places was probably heard to have “exceptional acoustic responses” from the singer/listener’s bodily experience of the surrounding space.

Third line of evidence: The representation of musical practices and sound-producing instruments

As in the previous section, this line too needs to be further researched in the field and in collaboration with Yokuts tribal members. No musical instruments are known to be depicted in Yokuts pictographs. However, in an alcove used for healing purposes at Rocky Hill, as well as at other Yokuts rock art sites, there are pictographs of concentric circles representing a whirlwind (Whitley 2020). Whirlwinds or *mojak’* (in Wukchumni Yokuts)⁴ were described by Francisca Lola as powerful and feared events caused by ritual specialists (Harrington, Reel 92, Image 158). Although different from whirlwinds, strong winds were mentioned in Harrington’s fieldnotes on another three occasions: first, as being “people” (Reel 89, Image 397; Reel 91, Image 823); second, as being caused by the flapping of the wings of a bird that lived on top of Mount Whitney (Reel 101, Image 500); and third, as a source of songs, as in the case of Tachi-Yokut ritual specialist Bob Bautista, who was able to obtain songs from the wind blowing above the presently drained Tulare Lake (Reel 89, Image 176).

Regarding musical practices, a blue heron or Huhuna dancer is depicted in a rock art panel on Rocky Hill.⁵ Archaeologist David Whitley learned about the interpretation of this pictograph from a Yokuts tribal member who collaborated with him; the panel was painted between the late 19th and early 20th centuries by a late family member (Whitley 2020). Both Gayton’s and Harrington’s ethnohistorical documents offer accounts of the Huhuna dancer. To begin with, in Gayton’s ethnography Huhuna dances are described as being part of the annual mourning ceremony and lasting over eight hours. According to the Yokuts knowledge represented in her texts, Huhuna dancers wore ritual regalia made of long feathers with rattling sticks hanging from the back (Gayton 1948a, 127–128). They also had a net covering their faces, abalone shells for eyes, and two horns protruding from the tops of their heads (Gayton 1948a, 43). Huhuna dancers “never sang” (Gayton 1948a, 41) but were accompanied by singers; they used a bone whistle which they blew repeatedly as they danced. They had a wooden stick in each hand, which they occasionally played against each other. During their dance, Huhuna dancers were ritually killed and revived by a ritual specialist and they also looked for hidden money. In Harrington’s fieldnotes, Yokuts tribal members Maria Wheaton (of Koyeti and Yawelmani descent) and her husband Tomás (of Wowol and Tubatulabal descent) referred to similar ritual regalia for Huhuna dancers. They emphasised the fact that Huhuna dancers could not see, as their eyes were covered by abalone shells (in Harrington, Reel 91, Image 823). They did not mention the mourning ceremony, the dance or the sticks.

However, they did refer to the use of the whistle, explaining that “in ancient times” Huhuna dancers blew it throughout the night and that, as a result, there was wind the next morning (in Harrington, Reel 91, Image 823). Moreover, they stated that Huhuna dancers went to “every place just like thunder” and that they were “the same as wind, that is wind’s body” (in Harrington, Reel 91, Image 823).⁶ Finally, it is important to mention that anthropologist Alfred L. Kroeber translated the Yaudanchi word *huhu’-udètec* as “bullroarer” (Kroeber 1907, 234; 1963, 219).⁷ According to him, this ritual instrument was linked to thunder (Kroeber 1963, 214). In the light of the sources currently available it is impossible to say whether or not the bullroarer had a name that was cognate with Huhuna. Nonetheless, with regard to archaeoacoustics, the ethnographic representation of Huhuna dancers does highlight the limited vision resulting from the design of their ritual regalia, as well as the importance of senses such as hearing, to find hidden money during their ritual dance.⁸

Fourth line of evidence: Musical instruments

No musical instruments were found by Elsasser in his 1957 excavation of Rocky Hill (Robinson 2006, 93).⁹ From a broader cultural perspective, nevertheless, a number of bullroarers and bone whistles have been found in south-central Californian Chumash caches (Hudson and Blackburn 1986; Whitby 2012, 278–285). In Harrington’s Yokuts fieldnotes, the bullroarer (or “*zumbador*” in Californio or Spanish) is repeatedly mentioned by Yokuts tribal members in connection with the “*antap*” (Reel 90, Image 585; Reel 90, Image 586; Reel 94, Image 334). ‘*Antap*’ was, “a society of ritual specialists” who “operated throughout much of Chumash territory” in “the protohistoric period” (Robinson 2006, 56). ‘*Antap*’ were also known by some of the Native American people interviewed by Harrington at the Tule River Reservation. In fact, according to Maria Wheaton, Yokuts and other tribal members from the then Tejon Rancheria were familiar with ‘*antap*’ because they saw them at fiestas (Reel 94, Image 453). The deer tibia bone whistles found in Chumash caches have also been associated with the ‘*antap*’ (Corbett 2004; Robinson 2006, 56; Whitby 2012, 287). Corbett has even proposed that a technical improvement in the construction of these whistles during the Middle Period (900–1150 CE) is related to a shift towards greater religious complexity among the Chumash (Corbett 2004; Whitby 2012, 287). Some of these whistles and bullroarers can be found at museums like the Ventura County Museum, the Santa Barbara Museum of Natural History, and the Peabody Museum (see Whitby 2012, 278–313). However, both bullroarers and whistles are sacred objects for south-central Californian Native American people, and so their study must be carried with the explicit authorisation of the pertinent tribal authorities, as well as that of the museums.

Fifth line of evidence: The production of rock art at or near lithophones

South-central Californian rock art sites like Rocky Hill have panels with pictographs, cupules and milling features close by or next to each other (Whitley 2006b; Gorden 2009; Hector 2009; Robinson 2011). Some Yokuts cupule petroglyphs were painted

(Hector 2009, 71, Whitley 2006a, b, 314). Although cupules could be associated with ringing rocks (Hector 2009, 72), further research is needed to confirm whether or not this is the case at Rocky Hill or other Yokuts rock art sites and this resonates with the suggestion above to collaborate and corroborate with Yokuts tribal members. Nevertheless, it is known that cupule petroglyphs in the Yokuts ancestral territories “served functional, ritual, and aesthetic purposes” (Gorden 2009, 25). Despite the fact that ethnohistorical and ethnographic evidence is scarce, Yokuts cupules are known to be made and used by female tribal members for fertility purposes and during puberty initiations, among others. Indeed, through ethnographic interviews conducted in 2008, archaeologist Susan Hector learned that “the Yokuts continue a tradition of women’s use of these features [cupules] at (...) Rocky Hill” (Hector 2009, 73). However, puberty initiations contain internal and delicate tribal knowledge. In our view, this line of inquiry should be consulted with tribal members and researchers must be prepared to keep it confidential if deemed appropriate by the tribes involved.

Conclusions

This article has revealed how ethnohistoric data, despite its problems, can bestow new and important understandings of the acoustic and sound-world of rock art sites. It has also highlighted the relevant but complex use of ethnohistorical documents to further our knowledge of both rock art and archaeoacoustics. Using the five lines of evidence proposed by Díaz-Andreu and Mattioli (2019), we have connected Yokuts rock art with ethnographic evidence to reveal the paths open for future formal archaeoacoustics investigations. Our survey of early 20th-century ethnohistorical sources about different Yokuts tribes has been essential to acquire a more detailed and culturally situated understanding of Yokuts soundways. As we have indicated, however, a critical reading of these sources is key, as also is collaborating and corroborating with the Native American people whose knowledge such documents claim to represent.

We started this article by mentioning informed versus formal methods for the study of rock art. In a multi-sited endeavour such as the Artsoundscapes project with a set formal methodology at stake, the informed approach we followed in this text contributes to illuminating the formal methods we are planning to follow in fieldwork. It brings forward conceptual inadequacies, such as separately categorising song and sound in the context of early 20th-century Yokuts soundways. It also points towards culturally relevant practices and perceptual engagements with the acoustics of rock art sites (i.e. the impact of altered states of consciousness in the auditory perception of certain Yokuts rock art locales). Furthermore, even though chronologically speaking the consulted sources might not coincide with all the sites to be archaeoacoustically measured, some of the points raised by such sources could still help to adjust formal tests so as to avoid discarding ontological perspectives that may escape researchers. Consequently, the use of both formal and informed methods is, we argue, the way

forward in the context of Yokuts rock art. Finally, ethnohistorical sources and anthropological research helps archaeoacousticians undertaking fieldwork to be aware of possible sites and lines of research that could be sensitive and/or restricted to certain members of the society involved.

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Notes

- 1 Archaeoacoustics fieldwork was originally planned for March 2020, but it had to be cancelled due to the Covid-19 pandemic.
- 2 See, for instance, Mary L. Keller’s “Indigenous Studies and the ‘Sacred’” (Keller 2014) for a discussion regarding the use of the term “sacred” in the context of Native American studies.
- 3 Here, we use the word “quests” to refer to the rituals that took place at rock art places and that involved creating and/or using rock art and rock art sites. Whether these rituals were ritual specialists’ vision quests that resulted in the creation and use of rock art (Whitley 1994; 2000; Whitley and Clottes 2005, 168) or rather, other tribal members’ quests – for whom the rock art functioned as both “an active accompaniment to” and a communication vessel “about the constituent elements of” an induced trance event (Robinson *et al.* 2020, 31035) – is still under debate.
- 4 For transcriptions and translations of whirlwind in other Yokuts languages see Kroeber (1963, 193).
- 5 In Gayton’s ethnohistorical text, Huhuna dancers are said to have an owl as a dream helper (Gayton 1948a, 110). In fact, Gayton’s drawing of the Huhuna dancer’s ritual regalia resembles an owl and not a blue heron (Gayton 1948a, 68). However, in a personal communication (11 March 2021), David Whitley stated that, according to contemporary Yokuts knowledge, Gayton had misidentified the associated bird species.
- 6 The relationship between power, the wind and caves/earth-holes appears twice in Harrington (Reel 91, Image 824; Reel 90, Image 820–821). In this last reference (Reel 90, Image 820–821), a place called *Shrok’win T’inliw* (“Wind Cave” according to Harrington’s translation) is mentioned. This place is said to have wind in it, “if you throw a boulder into it (...) it blows it out furiously” (*ibid.*).

- 7 Harrington asked Francisca Lola about *huhu'-udètec* meaning bullroarer and she stated that that word was wrong (Reel 94, Image 325).
- 8 The portrayal of eyes was rare in Yokuts rock art, although there are a few red turtles depicted with white eyes at Rocky Hill (Robinson and Sturt 2008, 36). Furthermore, fieldwork and ethnographic research are needed to look into whether or not the small circle shaped figures that are placed on the left and right sides of what might be the head of anthropomorph figures at Rocky Hill are depictions of ears.
- 9 The Artsoundscapes project will carry out fieldwork at Rocky Hill but our methodology is non-destructive, non-collecting and therefore, no excavations will be carried out.

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