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Productive Deceptions

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Chapter 9

Talking rocks, illusory sounds, and projections of the otherworld

Acoustics of sacred sites as a magic media in shamanic cultures

Julia Shpinitskaya and Riitta Rainio

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Magic and illusion at sacred sites: an introductory note

While broad interest in the historical, theoretical, and practical issues behind staged illusions and magic performance in modern culture is on the rise, it is perhaps less commonplace to seek the prototypes of present-day magic media in the realm of archaic shamanic practices. Meanwhile, the natural elements of ritual sites can be counted among the magic media of shamanism responsible for bringing auditory and visual illusions to life. The archaeoacoustic team of the University of Helsinki has been studying how sacred sites in Northern Europe, used by shamanic cultures since prehistoric times, are home to remarkable acoustic properties. As ethnographic sources clearly point out, sacred sites were places inhabited by spirits, places where the voices of spirits could be heard. Apparently, this unique value, together with a special power available from the same places, made the sites ideal locations to perform rituals and magic. This premise served as a starting point for an initiative to test and analyse the acoustic conditions of Fennoscandian sites back in 2013. It was discovered that the steep cliffs and rock walls of such natural landscapes create echoes and illusory or hypnotic sounds, endowing the performed sounds with a magical effect, or responding “voices”.

This chapter focuses on natural-site acoustics as a magic tool in ritual practices. Based on our acoustic measurements as well as experimental sound tests carried out during *in situ* studies of prehistoric and historic sacred sites in Finland, we discuss possible sound media (voice, instruments, noise), performing techniques and methods of sound production used at the sites. While the acoustic study of the sacred sites is at the core of our research, we also discuss the visual aspects and visual phenomena observed at the sites during our fieldwork. Our attempt to restore the sound culture of shamanism associated with the hosting sites and their sound potential profoundly rests on ethnographic research of the Finno-Ugric peoples, predominantly the Sámi and the Finns. The end result of this ethnographic and practical research study is our interpretation of the shamanic ritual practices as seen through the prism of the miraculous acoustic illusions and visual appearances created by the sacred sites.

Sacred rocks, sacred acoustics and echoing landscapes

The sacred sites discussed in this chapter are prehistoric rock art sites in Finland and historical offering sites of the Sámi in northern Finland, Sweden, Norway, and northwest Russia. While the rock paintings were made by Subneolithic hunter-fisher-gatherers between 5200 BC and 1000 BC, the offering sites, called *sieidi*, *sáiva*, *passevare* or *passe paikh*, were used by the indigenous Sámi people, who during the twelfth to the nineteenth centuries practised a livelihood based on reindeer herding, hunting, and fishing (Manker 1957; Pentikäinen 1995; Lahelma 2008; Äikäs 2015). Despite the differences in dating, geographical distribution, and other characteristics,¹ these two types of sacred sites have much in common. According to some researchers, they can be regarded as representations of more or less the same tradition (Luho 1971; Núñez 1995; Lahelma 2012).

Typically, both sites consist of a massive rock, either an exposure of granitic bedrock or a separately standing boulder. At least one part of the rock is straight, vertical and wall-like in appearance and has been worn incredibly smooth by the glacial ice sheet (see Figure 9.1). Often, the wall-like part of the rock tilts 91–115 degrees forwards. The maximum height of the wall-like part of the rock is 40–50 m, and the area covers approximately 30–300 m². In most cases, the rock is situated in a rugged terrain, on the side of a mountain, hill or ridge that also has other imposing rock formations, such as caves, crevices and ravines and has experienced rock-slides or displays peculiar anthropomorphic or zoomorphic forms created by erosion. In the case of the rock paintings, the rock cliff is nearly always situated on the shore of a lake, rising directly from the water. This suggests that the paintings made with red ochre were crafted from a boat or a canoe or, alternatively, from the frozen surface of the lake (Seitsonen 2005, 7). Generally speaking, the rock painting sites and the Sámi offering sites are situated along ancient important waterways and migration routes, relatively far from contemporary settlement sites (Leem 1767, 443–4; Manker 1957, 97–290; Kivikäs 1995, 18–20, 325–33; Lahelma 2008, 20–1). This suggests that the places considered sacred or special were somewhat remote and isolated.

Massive rocks of the type described above are acoustically highly reflective. The reflectivity arises naturally from the hard and solid material of the rocks and receives an extra boost from their vertical, smooth, and large surface. These types of rock walls are, in effect, the most efficient sound reflectors found in nature, projecting, emitting, and carrying further the sound waves striking them. Acoustic impulse response measurements, performed at Finnish rock paintings and the offering site of Taatsi in 2013–2020, indicate that all of these sites have a distinct characteristic echo (Rainio et al. 2014, 2017a, 2017b; Lassfolk and Rainio 2019, 2020). This echo is strong in amplitude and is a fairly accurate copy of the given sound signal. It repeats a broad range of the given sound frequencies, even from afar, duplicating the signal compactly once, without giving innumerable consecutive



Figure 9.1 Sacred Rocks at Olhavantuori prehistoric site. The protruding part of the rock in the centre of the image creates impression of a giant face, with eyes and mouth formed by the rock crevices and shadows.

Photo by Julia Shpinitskaya.

copies like most echoes do. Moreover, the echo is clearly localizable: it projects unambiguously from the monolithic surface of the smooth rock wall, not from various ambiguous directions.

In addition to this special echo, the studied sacred sites produce several other echoes. These other echoes are softer in amplitude and less accurate copies of the given signal, diffusing and distorting the signal into various forms and directions. These echoes project from the rocky formations situated in the surroundings, where reflecting surfaces are discontinuous, uneven and relatively small in size. On the whole, it is possible to state that the sacred sites discussed here have a special type of echo and echoing acoustics that make the sites distinct from other sites and environments. Using a visual comparison, the smooth rock wall could be equated to a plane mirror that shows the object sharply, while the other rock formations could be equated to funhouse or broken mirrors that show the object in fuzzy, warped or distorted forms.

Sacred rocks as places of power: shamanism and the spirit world

The significance and use of both prehistoric Finnish rock paintings and historical Sámi offering sites can be associated with shamanism. In this case, the term shamanism refers not only to a general worldwide collection of archaic beliefs and practices (e.g. Eliade 2004; Price 2004; see also Siikala 1981), but also to a historically specific form of shamanism recorded in northern Fennoscandia (Taavitsainen 1978; Siikala 1992; Pentikäinen 1995; Lahelma 2008, 45–64). The shamanic tradition among the Sámi and the Finns comprised all elements typical of so-called hunter-gatherer shamanism, referring to individuals with special powers and skills, the pursuit of altered states of consciousness, out-of-body experiences, sensations of metamorphosis, and access to an alternative reality (Chippindale et al. 2000; Lewis-Williams 2003). For the most part, Finnish rock paintings feature simple human figures, boats, elks or deer, and other animals. However, these figures often appear in strange unrealistic postures and combinations that reveal that the paintings do not necessarily depict things in the real world, but rather beliefs, rituals, and religious ideas.

According to rock art researcher Antti Lahelma (2008, 51–64), shamanism, especially in its northern Fennoscandian form, offers a best-fit explanation for almost all central motifs and pictorial combinations represented in the Finnish rock paintings. Human figures depicted as falling (at an approximately 45° angle), lying down (at a 90° angle), or upside down (at a 180° angle) can be interpreted as representations of prehistoric shamans falling into a trance and plunging into the Underworld. The fish, snakes, and elks or deer accompanying these humans, touching them or merging into their bodies can be interpreted as zoomorphic spirit helpers coming to the shamans, metamorphosing with them and carrying them to the spirit world. Human figures with antlers, bird-like beaks, or wing-like

arms can be interpreted in the same way. Furthermore, boats depicted as moving downwards or merging strangely with the bodies of elks or deer can be interpreted as representations of shamans' vehicles to the spirit world. The same reading applies to the round objects, probably drums, that a few anthropomorphs hold in their hands (Rainio et al. 2017a, b). Indeed, the shamanic interpretation of Finnish rock art suggests that the painted rocks, cliffs, and boulders were considered repositories of the spirits or of spiritual potency that the shamans could access through visits to the sites and rituals performed at them (Lahelma 2008, 59). The act of making of the paintings may have been related to the rituals themselves and/or to an effort to pass this kind of spiritual knowledge from one generation to the next. Prehistoric pendants, arrowheads, pot sherds, and animal bones excavated at the sites indicate that the rituals included campfires, meals and offerings (Lahelma 2006).

Shamanic rituals and beliefs associated with the offering sites of the Sámi can be retrieved, at least fragmentarily, from ethnohistorical sources dating back to the seventeenth to the nineteenth centuries (Leem 1767, 408–16, 444, 475–80; Jessen 1767, 23–6; Friis 1871, 102–39; Genetz 1892, XLIII–IV; Rheen 1897, 33–42; Tornaeus 1901, 30; Lundius 1905, 7; Niurenlius 1905, 21; Forbus 1910, 66–7, 83; Kildal 1910, 90–1; Olsen 1910, 43–4, 83–9; Solander 1910; von Westen 1910, 2; Schefferus 1963, 163–4, 177–9, 201). Sacred rocks, cliffs, and boulders were regarded as abodes of spirits that served as tutelary spirits of the shaman (*noaidi*) and bore the names *Sacred Mountain Bird* (*Passevare lodde*), *Sacred Mountain Fish/Snake* (*Passevare guli*), *Sacred Mountain Reindeer* (*Passevare sarva*), *Sacred Mountain Man or Woman* (*Passevare olmaj/neida*) or the *People of the Underground World* (*Mad-vuolaš-olmo, jennam-jielli*).² Sacred rocks served as entrances to the Underground World, where the spirits lived upside down, feet against the feet of the living people. Thus, the Underworld that also encompassed the underwater realm was a kind of mirror image of the world of the Sámi (see Figure 9.2).

Yoiking as sacred singing: shamanic ritual and its sound expression

The Sámi shamans accessed the Underworld by inducing themselves into trance state, either at the sacred rocks or further away in their villages, tents, or huts (in addition to the sources above, see also Paulaharju 1927, 76, 307–9; 1932, 16–22, 37, 53).³ In this type of séance, the shamans beat their drums (*goavddis*), first at a slow pace, then faster and louder. The drum's metal rings, chains, pendants, and other accessories produced a deafening noise. In addition, the shamans yoiked (*juoigat*), that is, chanted in the traditional Sámi way using what is known as tense voice (more on this below). They summoned Sacred Mountain Bird by chanting its personal yoik, and as soon as the bird was yoiked, it appeared (Jessen 1767, 25). They summoned Sacred Mountain Fish or Snake by yoiking as loud as



Figure 9.2 Representation of the underworld at Värikallio sacred site: a mirrored image of the entire rock, with the red-coloured paintings upside down (Sáiva world).

Photo by Julia Shpinitskaya.

they could, because the louder the voice, the larger the fish that appeared (Jessen 1767, 26). Furthermore, they summoned Sacred Mountain Man or Woman by yoiking the name of the mountain in which the spirit lived. This was because Sacred Mountain Men or Women did not have any specific names but were known instead by their respective places of abode (Forbus 1910, 66–7, 83). From such descriptions, we can surmise that the name of the rock was, in fact, the same as the name of the spirit.⁴

All phrases were repeated by the assistants or companions of the shamans with rising intensity and pitch. When all tutelary spirits were present and ready to convey the shamans to the Underworld, the shamans commanded the helpers to “harness the reindeer bull, launch the boat” or to “set off” and then they fell down like dead corpses (Leem 1767, 477; Lönnrot 1932, 86). During their journey to the Underworld, they heard the spirits talking and yoiking, and they talked and yoiked with the spirits in a soft, mumbling, or whispering voice, called *vuolet zäbme*, that the assistants or companions could discern. They asked for the spirits’ help and advice on healing and matters related to hunting, herding, offering, foreseeing, or fighting other malevolent shamans. In addition to these activities, the rituals at the sacred rocks included offerings, campfires, and sacrificial meals as well as rubbing grease on the rock and praising its power through sacrificial chants (see also

Ravila 1934; Turi 1979, 95). Moreover, at other times people passing the sites needed to show respect for the rocks by keeping silent, because noise and making sound in other than ritual contexts was strictly forbidden (see also Harva 1928, 13–21; Paulaharju 1932, 22, 35, 36, 42, 53).

Although yoiking, with its several local variants (*luohti*, *vuolle*, *leudd*, *luvv't*), is currently practised in all kinds of circumstances (Järvinen 2005, 46–9), the historical records above describe it as being at the core of the Sámi's shamanic tradition, meant to establish connection between human, nature, and the world of spirits. Also, contemporary researchers associate the origin of yoiking with ritual singing, with several calling attention to its shamanic roots in support of their arguments. First, yoiks often consist of animal and bird sounds, onomatopoeic effects, and asemantic syllables, with the latter apparently concealing the meaning of some type of magic text (Lagercrantz 1928; Tirén 1942, 34–53; Szomjas-Schiffert 1996, 75–6). Similar animal languages and secret languages for communicating with animals and spirits were used among shamanic cultures throughout the world (Eliade 2004, 94). Second, yoiks not only represent a form of communication, but also function as a way of calling, signalling, or evoking their subjects, such as humans, animals, mountains, lakes, and other places. By depicting these subjects through imitation of their sounds, movements, and forms, yoiks work on the principle of sympathetic magic and resemble the calls of Siberian, Asian, North and South American shamans, who invoked animal spirit helpers by imitating their voices and cries (Lehtisalo 1937, 21–31; Znamenski 2003, 75, 106–7, 126–8, 243–5; Eliade 2004, 97–8).

Furthermore, yoiks employ a vocal technique that involves a compressed sound, or tense voice, produced by singing with a high larynx, narrow throat, and tightly closed vocal cords. This singing style, in which an attacked (forced) sound is applied to a moving tone, in some cases results in immediate switches between low-pitched and high-pitched registers and effects of quick glissandi, grace notes, and intricate ornamentation (Vize 1911, 484; Arnberg et al. 1969, 55, 57; Lüderwaldt 1976, 56–7). Although not yodelling in the strict sense of voice production, yoiking has often been compared to the yodelling technique for the immediate virtuoso alternation of registers in full voice (Arnberg et al. 1969, 57; Szomjas-Schiffert 1996, 64; Plantenga 2004, 104; 2012, 186). This technique speaks in favour of the use of yoiks for calling or signalling, because similar techniques have been applied in various other cultures in singing genres related to calls owing to their signalling properties (e.g. Alpine yodelling and Swedish *kulning*, with both being herding calls) (Plantenga 2004, 99–105). This type of singing, designed for open-air and echoing locations, involves strong and powerful sounds that could easily cover long distances in mountain areas and rocky landscapes with lakes. In addition, yoiking requires strenuous exertion, leading to the type of physical and mental exhaustion mentioned by yoikers, who had to stop once their strength had been drained (Arnberg et al. 1969, 57). Apart from use in calling, this exhausting voice production brings in mind the shaman séances exercising power of voice and physical and mental strength to their limits.

Finally, two types of yoiking have been categorized among the contemporary Northern Sámi in Finland: a loud shouting type, reaching high notes with emphatic shrieks, and a mumbling type done in a low voice position and intimate mode, similar to a spell (Szomjas-Schiffert 1996, 64). This categorization is reminiscent, on the one hand, of the loud spirit calls and, on the other, of the soft mumbling of the entranced shaman described in the historical sources above. Although the existence of these shamanic practices is only evidenced in the cited sources from the seventeenth to the nineteenth centuries, without any further information on musical forms or structures, it seems that contemporary yoiking in the twentieth and twenty-first century might bear shared characteristics, elements, or reminiscences of a very old form of shamanic chanting.

Experimental approach to site acoustics: sound tests and audio experiences

When conducting fieldwork at prehistoric rock painting sites in the Finnish lake district, we performed standard acoustical impulse response measurements and ran a series of creative tests to experiment with the acoustics. The main idea behind the creative tests was to hear the acoustic response of the rock face to live sound, and, thus, to experience site acoustics in practice. The tests were run as sets of various sound types, including vocal sounds (particular singing methods, talking voice, phonetic combinations and a wide range of voice expressive gestures differentiated in volume, strength, and register and representing different capacities of human voice – e.g. cries, laughter, and sound mimicry); instrumental sounds (drums and sucked trumpets), and noises (produced by means of wooden or iron objects, boat and oars).

The types of sounds selected for performance were based on ethnographic information regarding shamanic séances and our estimation of possible sounds that could intentionally be performed during a shamanic ritual. First, they included animal and bird imitations and onomatopoeic sounds because sounds of this type could be used by shamans for calling spirits or animal spirits. We also assumed that real bird and animal calls could be heard near the sacred sites as a natural sound event, in which case they could be experienced as a particular acoustic event. Second, the vocal sounds covered different voice expressions ranging from typically piercing, energetic, and sharp, high-pitched or low-pitched sounds (cries, shouts, squeaks, and laughter) to soft and indistinct grumbles and murmurs, based on the range of voice dynamics attributed to the rituals. Third, the selected sounds comprised vocal strategies engaged in distance singing of the yodelling type, such as calls and signals produced with tense voice and intended for open-air spaces and the natural environment (*kulning*, the Swedish herding call, or Russian forest calls). With such singing methods in mind, we applied typical vocal methods used in Sámi yoiking to test the site acoustics, including large interval leaps, quick glissandi, grace notes

(“chirping” sounds), and dropped-off and paused accented high sounds. Fourth, we also applied the types of articulated utterances of phonemes and phonetic combinations typical in Finno-Ugric languages in our test selection. Finally, single drumbeats and continuous rhythmic drumming were employed as part of the tests because the shaman’s drum was apparently an essential part of the ritual.

As a result of testing these sound sets in the acoustic conditions of the sacred sites, we experienced several notable effects that could be described according to three main distances kept from the rock face. When approaching the site more or less perpendicular to the sacred rock, the echo projecting from the rock can be faintly discernible from afar, even from a distance of a couple of hundred metres. The first notable difference in the projection of the echo can be marked at 80–40 m from the rock surface and named *calling distance*. At this point, the echo becomes clearly audible and is projected back to the sender in 0.5–0.2 sec. This time delay requires that the caller should make one or two sharp signals and then pause to listen to the echo response. The caller must also raise her/his voice for it to have a clear and sonorous response. The signals that seem to work best in this distance zone are loud, energetic, high-pitched, and piercing sounds: the type of cries, shouts, hoots, or screams, such as imitations of animal vocalizations and bird calls or singing by applying vocal cord tension and abrupt changes from chest to head voice, used in yodelling techniques and singing manners alike (Sound Sample 9.1). However, singing long phrases without pausing at this distance does not make sense, because in that case the continuous singing masks the returning echo. Drumbeats also work remarkably well, and the site’s acoustics provokes the drummer to maintain a steady rhythm or beat, at a moderate tempo, because it creates an effect of drumming in turns with the echo (see Figure 9.3). In this distance zone, the echo gives one the sensation of receiving an answer, response, or reaction from the rock or of waking up an inanimate being.

Sound Sample 9.1 Testing high-pitched hoots and screams in front of the rock painting at Kalamaniemi, at a distance of 43 m from the rock. Voice and recording by the authors.

Moving closer to the sacred site, a *talking* or *singing distance* can be experienced at 40–20 m from the rock, when the echo projects the sound signal back to the sender more quickly, in just 0.2–0.1 sec. This time delay requires that in order to hear a distinct echo, a performer should make the signals shorter and sharper than in the previous zone. However, since the response is so rapid, there is no need to pause to listen to the echo anymore; instead of waiting for the echo, the performer can continue making new signals almost immediately. In addition, since the echo has now grown in amplitude, there is no need to make especially loud sounds, to raise the voice or to exercise any special voice effort or tension (Sound Sample 9.2). The signals that work especially well at such a *talking/singing distance* are

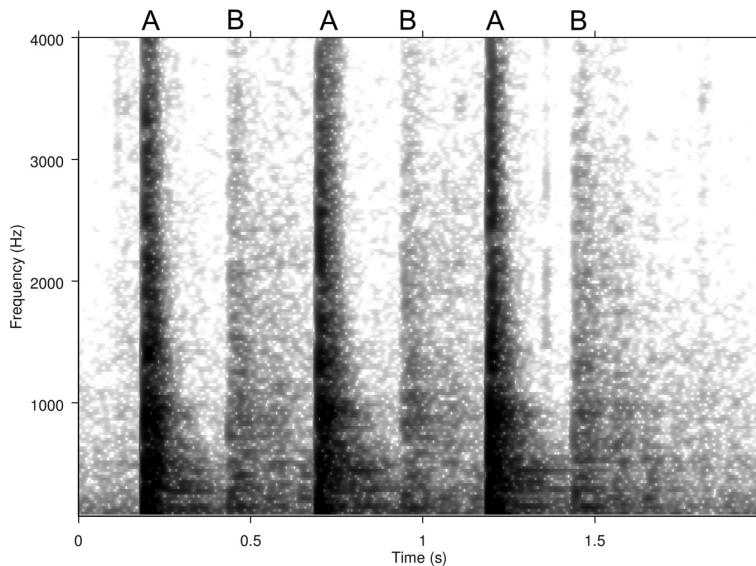


Figure 9.3 Spectrogram showing how drumbeats (A) are duplicated by the rock painting at Vaskivuori, situated 43 m from the performer and the microphones. The echoes (B) accurately repeat the frequencies and structure of the signals. The amplitude of sound is represented by the intensity of the greyscale. The spectrogram was made with the Spectutils software.

fragments of verbal communications (articulated phonemes and syllables, words and excerpts of verbal speech in general) or sequences of discrete and well-articulated, staccato-like vocal sounds, such as laughter and noises with a percussive effect, akin to hand clapping or drumming (see Figure 9.4).

Sound Sample 9.2 Talking with the rock painting at Olhavanvuori, situated 29 m from the speaker and the microphones. Voice and recording by the authors.

However, continuous singing at the *talking/singing distance* can also be effective, provided that the phrases contain dropped-off or paused notes, large interval leaps, quick glissandi and grace notes (ascending and descending chirping sounds) that stand out from the general texture, and, hence, become audible as echoes. It is important to note that such are the typical sounds that form a significant part of the Sámi yoiking techniques. Even the slightest and faintest signals – all kinds of cracking, clicking, squeaking, tapping, snapping, and murmuring sounds – can be heard echoing back from the rock at this distance point (see Figure 9.5). A tempo of the pulse, created by clapping, drumming, or clicking along with the echo, can be faster than the one that occurred in the previous zone, and the tempo accelerates with each step towards the rock (Sound Sample 9.3). In this zone, echo-making gives one the sensation of being able to communicate and

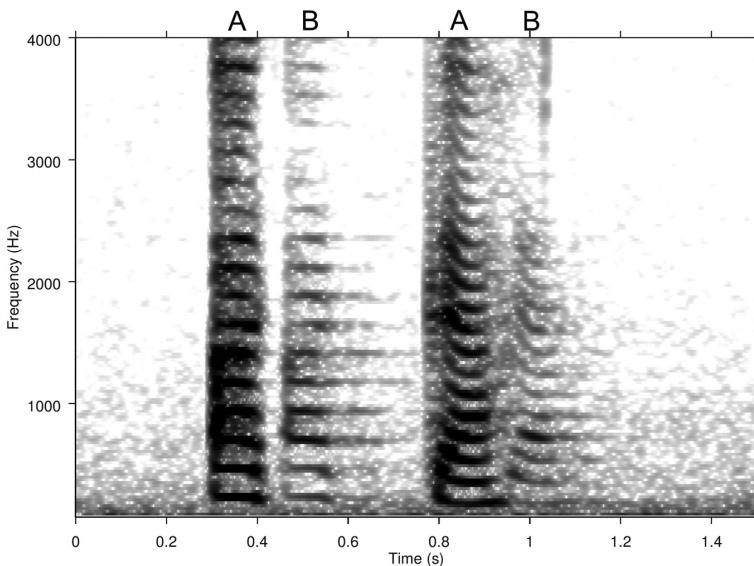


Figure 9.4 Spectrogram showing how syllables of the word Ak-ka (A) are duplicated by the rock painting at Haukkasaari, situated 27 m from the speaker and the microphones. The echoes (B) accurately repeat the frequencies and structure of the signals. The amplitude of sound is represented by the intensity of the greyscale. The spectrogram was made with the Spectutils software.

interact with the rock by talking, singing, and conversing together with the rock. This impression becomes even stronger and more powerful if a listener is placed apart from the performer, either to the side of the performer or between the performer and the rock. In the case of drumming, from this position it is possible to experience a kind of polyphonic hearing or a surreal stereo effect: the performer's signals doubled with similar sounds coming from the rock, and, thus, emitted almost simultaneously from two different directions.

Sound Sample 9.3 Testing clicking sounds in front of the rock painting at Olhavanvuori, at a distance of 29 m from the rock. Voice and recording by the authors.

When moving even closer to the sacred rock, at the distance of 20–10 m,⁵ one can experience what could conventionally be called a *silent/quiet distance*. At this point, the echo suddenly disappears, with the sound reflection from the rock being projected back so rapidly that it practically merges with the signal itself. As a result, the performer in this *silent* zone cannot distinguish between the echo response and his/her own sound signal or voice. This particularity also applies to prehistoric people who came to the foot of the rock to paint or grease the rock in a ritual offering. However,

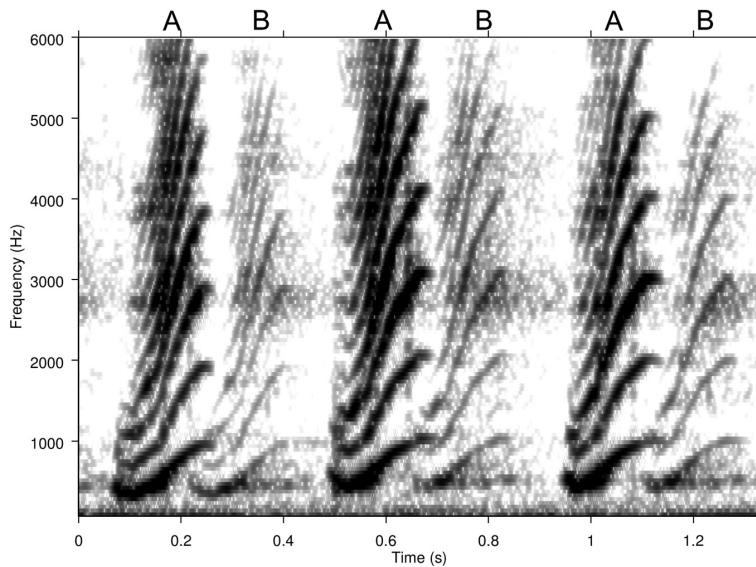


Figure 9.5 Spectrogram showing how vocal squeaking sounds (A) are duplicated by the rock painting at Haukkasaari, situated 27 m from the performer and the microphones. The echoes (B) accurately repeat the frequencies and structure of the signals. The amplitude of sound is represented by the intensity of the greyscale. The spectrogram was made with the Spectutils software.

a listener staying some distance farther away from the rock can hear that, in fact, the performer's signal is amplified and strengthened by the sound duplicated by the reflecting rock.

Additional echoes were encountered in all the above-mentioned zones and positions – those echoes reverberated from other rocks, cliffs, slopes, and shorelines in the surrounding landscapes. Being echoes from afar, often two to four in number, they arrive later than the echo from the sacred rock and form a multitrack extension of the main sound or a reverberant tail to it. In cases where the signal bounces between the sacred rock and the opposite shore, a long fluttering distortion of the original signal can be heard. All these various echoes come from different directions and result in an effect of the whole site, including the lake and its landscape, responding to the performer and taking part in the interactive performance. Since a combination of echo responses is different and even unique at each sacred site, we can speak of special sounds and signals favoured by the acoustics in each case. The site in a way guides the performer and dictates the best performing strategies and techniques in order to reveal and manifest its concealed acoustic qualities. The particular strategies that reveal the individual acoustic properties of a site and capture the essence of the site's sound potential can be understood as the site's sound embodiment. Last but not least, surprising environmental elements entered into our acoustic site

experience during the course of the fieldwork. These elements were bird and animal voices heard through the site acoustics as well as birds and animals reacting and responding to the voice animal imitations or noises. Our voice tests thus far have attracted a response from a common crane (*Grus grus*), a rough-legged buzzard (*Buteo lagopus*) and a mouse (?) (skulking in a crack of Haukkasaari rock) as well as a visit from and call by a whooper swan (*Cygnus cygnus*) (see Video 9.1).

Video 9.1. Mouse (?) – a spirit talking from a crack in Haukkasaari rock, in response to the squeaking sounds from the boat and its oars. Video by Julia Shpiniteskaya.

Visible/invisible: optical effects and visual experiences at the sacred sites

The audible acoustic effects that can be experienced at the sacred sites were, of course, the target of our field study. However, while performing the acoustic tests and taking measurements at the sacred rocks, we also experienced a number of thrilling and intriguing visual phenomena that complemented the audio phenomena inherent to the sites. While some of the phenomena have been generally known among researchers, others were discovered by our team by chance, on the spot. Therefore, in actual fact the sacred sites provided the evidence of an integral audiovisual system of illusory effects, and indeed the visual factors of the sites must also be highlighted for their role in providing magic experiences.

Rock art researchers and Sámi ethnographers (Manker 1957, 23; Taavitsainen 1981; Lahelma 2008, 121–42; Äikäs 2015, 86–9) have long been aware that sacred rock sites often feature natural formations resembling giant anthropomorphic or zoomorphic heads or figures. The strong visual effects created by these formations may well be associated with myths and rituals dedicated to ancestors and divine creatures (see Figure 9.6). While some such sites bear only faint resemblances that can be contested, others, such as Astuvansalmi or Olhavanvuori, have been frequently mentioned in research literature, and researchers have hypothesized that people worshipped the formations for their visual appearance. Not all of the anthropomorphic or zoomorphic sites present a macro formation demonstrating a head or figure itself. However, the crevices and original textures of the rock surface resemble anthropomorphic or zoomorphic faces (eyes/eyebrows, mouth, nose) that can clearly be seen from the shore of the lake, when standing in front of the rock. Both types may have had a strong impact on site visitors and may well have been associated with spirits residing in the place.

Another visual phenomenon acknowledged in passing by rock art researchers and ethnographers (Manker 1957, 195–8; Kivikäs 2005, 31, 136; Parkkinen and Wetterstrand 2013, 22, 134–5, 154, 164–5), and substantiated by our own site experiences, are reliefs and crevices in the rock texture that look more or less rectangular or arched in shape, suggestive of



Figure 9.6 One of the most evident stone figures displayed at the sacred site at Haukkasaari rock: a megalithic anthropozoomorphic figure, as high as the rock itself, towers above water like a guard, among surrounding rock formations. The reflection of the rock represents Sáiva world.

Photo by Julia Shpinitskaya.

entrances. From a mythological perspective, these visual elements as well as other kinds of cracks, crevices, and cavities in the rock can be associated with doors and gates – entrances to the Underworld. In the Sámi legends, sacred beings and animals (foxes, reindeer, birds, and underground people) enter such cracks and disappear there (Harva 1928, 15, 16, 18; Itkonen 1931, 182–4; Laestadius 2002, 106–14). However, when exploring crumbling types of rocks or highly fractured surfaces, some precaution is needed, because the rocks have not necessarily retained their shape for millennia.

Complementing this account of sacred sites, we can add a description of a magic mirror optical illusion created by a water surface (Miettinen and Willamo 2007, 18–21, 135–8; Parkkinen and Wetterstrand 2013, 15). On a sunny and quiet day, the surface of lake water is a perfect reflector that can demonstrate an ideal image of the entire cliff, with all its details clearly visible in reflection, albeit upside down. In this case, the lake surface serves as a magic mirror that can be interpreted, on the one hand, as a shield hiding the real view behind it, and on the other as a screen manifesting a magic reality, or Otherworld. As the magic mirror shows a secret world, one hidden from regular view, the reflection of the rock in the lake water therefore represents entrances to the Otherworld situated beneath the water (*Sáiva* world, to use the Sámi word). When evaluating the cracks and gate-like features revealed at the sites, the most impressive was the one viewed

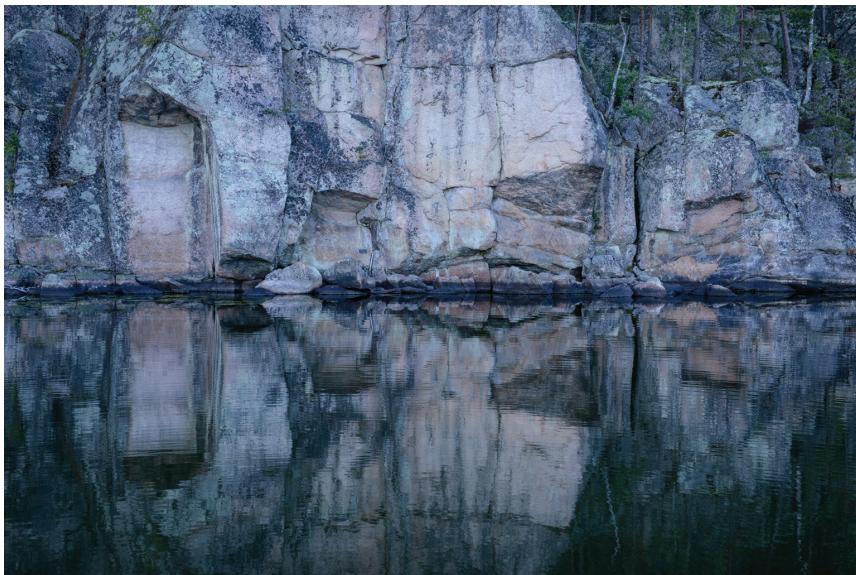


Figure 9.7 Mertakallio rock site: four gates/doors and their reflection (Sáiva world).
Photo by Julia Shpinitskaya.

at Mertakallio, which revealed a five-door structure reflected by the water's surface (see Figure 9.7).

Finally, the archaeoacoustic team of the University of Helsinki discovered another important visual factor in recent years (see also Valovesi 2020). This effect can be termed a *light animation*, one analogous to shadow plays in traditional cultures or moving images in visual media technologies and generally caused by certain weather conditions. Light animation can be created by flare spots as a result of specks of light being reflected onto the rock from the water as it shimmers and dances in the sunlight. Moving across the rock, those glares make the rock's surface appear alive, as if it were an illusory living being. Moreover, if this moving light element occurs at a rock painting site, it provides the spectacular effect of causing the paintings to seem animated. This effect of light animation is created by a flat and wall-like even surface, rather large in area, that acts as a screen. The "screen" provides a better effect if its position is tilting somewhat towards the water, because reflections under protruding ledges are the strongest. We have seen such light animation in action many times, in sunny and relatively calm weather,⁶ but this summer we had the rare occasion to witness it at its best, with the brightest light game projected by shimmering water that, at the same time, occupied a large area of the rock wall at Salmijärvi site (see Video 9.2).

Video 9.2. The brightest and most extensive reflection of sunlit water at Salmijärvi rock site. Video by Julia Shpinitskaya and Riitta Rainio.

Concealed sound as the site's sonic potential: the inaudible and the spiritual

The remarkable acoustic discoveries made at the rocky sacred sites imply that silence was an important and powerful element in the ritual. Initial silence as a precondition to approaching the sacred site could ensure the acoustic outcome of the shaman's sonic interaction with the site. Ethnographic sources confirm that the silence of ritual spaces was strictly protected (Leem 1767, 443–4; Friis 1871, 136–7; Vize 1912, 399–400, 456; Harva 1928, 13–21; Charnolussky 1972, 66–7). Sámi stories often tell about approaching sacred cliffs in total silence, avoiding even the slightest human-made noise produced, for instance, by rowing boats or sledges. Moreover, maintaining a state of silence at the sites did not concern only ritual time. General noise taboos at sacred sites were also quite common among the Sámi: making sounds outside the ritual was strictly forbidden, apparently to preserve the natural silence of the acoustic space. This could mean that the acoustic space of the sites was only destined for special sound actions. Under such circumstances, the sonic space enlivened by the chanting and drumming of the shaman and the assistants would transit from the soundlessness and voicelessness of the world to the sounds and voices of the Otherworld. This seems to have been a key strategy for making the place come alive and for awakening the spirits, and thus for awakening the sound of the place, which had until then remained in a dormant, inaudible state.

Since the sacred sites were associated with spiritual potency, the meaning of the sites as repositories of spiritual power coincided with the meaning of the sites as repositories of sonic potential. The Sámi, and most probably their prehistoric predecessors who used similar echoing sites for shamanic rituals, came to understand that the natural environment – the world around them – is filled with sonic capacity, resulting in the establishment of a dynamic relationship with this environment via sound interaction. On the one hand, landscapes, thought to be silent, in the indigenous view appear as places preserving intrinsic sound and spaces to be sounded. On the other hand, yoiking, the Sámi sacred singing form used in the context of shamanic rituals, appears as a sonic representation of those places, needed to release the sound from the landscapes preserving it. This sonic immanence, or immanent soundscape – to the Sámi a manifestation of the divine – creates a sonic potential corresponding to the notion of *concealed sound*.

Concealed sound is an approach to understanding sacred sound, with the term (Shpinitzkaya 2013; Shpinitzkaya 2017) emphasizing the particular meaning behind the sacred sound and related to the sound before existence or the sound in its inaudible state, thus calling attention to the immanent sonic potential of the world. Such a notion is a part of myths, religious beliefs, and rituals, ranging from the religious mysticism of Hinduism, Indian and Tibetan Buddhism, Zen Buddhism, and Sufism to Ancient Greek, Islamic, and Christian traditions. Concealed sound is fundamental to understanding the spiritual practices that link spirituality with sound,

cosmos and frequencies and refer to sound as the deep essence of the world and the origin of all beings and objects. This sound concept should read as a code that underlies trance and meditation practices, transpersonal experiences, and altered states of mind, one connected to mysteries and ecstasies, healing ceremonies, and religious chanting. The belief in sound as a spiritual and magic tool emerged from the idea of the divine nature of sound that exists in an inaudible state. In shamanic cultures, it reverberates in the stories of sacred chants, healing songs, and magic tunes transmitted to shamans and magic practitioners from spirits, deities, gurus, guides, and helpers in an altered state of mind, trance, meditation, or dream. The ritual use of sacred acoustics joins the list of sacred sound practices, suggesting a sublime understanding of the world and its supernatural power as concealed sound.

Most definitely, the concept of Sámi yoiking builds a bridge to the concealed sound concept. Thus, the Sámi's widespread stories tell that yoiking as a style and yoiks as personal chants were learnt from spirits during a séance and trance when a shaman listened to the spirits yoiking and repeated their phrases (Jessen 1767, 23–4; Lundius 1905, 5–6; Olsen 1910, 25–35). The shaman was supposed to memorize the chants and later use them to connect to the spirits, whenever they needed to be contacted. Moreover, it is important to know that yoiks are thought to be based on a system of leitmotifs referring to their topics (Tirén 1942: 34–53; Travina 1987, 25–35). The leitmotifs are expressed through basic melodic and rhythmic model structures, applied to construct the chant and adjust to different texts (which could be improvised). Second, it is significant to know that sacred places, like rocks, have their own yoiks, which were performed at specific rocks and used for contacting the spirits, such as anthropomorphic Sacred Mountain Men or Women, residing in them (Fellman 1906, 229–31; Forbus 1910, 66–7, 83; Paulaharju 1932, 12–28; Tirén 1942, 46–7; Manker 1957, 204, 222). This, for the most part, means that every subject or object mentioned in a yoik has its own sound representation, and, in particular, it means that sacred places, like rocks, have their own magic sound embodiments. Last, but not least, yoiks are understood by the Sámi as being identical with their object (Plantenga 2004, 103; 2012, 188; Graff 2011, 38–9). The yoik is not actually a chant about an object/person/animal/place; rather, it is a chant identical with that object/person/animal/place. Therefore, a yoik can be interpreted as a magic sonic embodiment of that concrete object, person, animal, or place (or its spirit). By means of yoiking as a sacred sound tool, a yoiker becomes identical with the subject or object of the yoiking; moreover, the object, person, animal, or place that is being yoiked becomes magically present *here* and *now*. By this sound act, a magic link to the subject/object is established, while the yoiker him/herself embodies a human, animal, or place: within the context of shamanic practice, it would imply that transformation or travel has been completed.

Concealed sound should be understood as an immanent sound quality that emerges out of the characteristic properties of places or objects and

allows a shaman to retrieve or release the sound from the place or object. In local tradition, the Sámi shamans and their prehistoric predecessors probably employed rocks as specific sound devices acting as musical instruments. Archaeoacoustic studies can provide the following interpretation of the concealed sound concept and an acoustic model of the release of concealed sound from the place: rock sites that were used as ritual sites worked as sound reflectors, sending the sound vibration back to the sender (yoiker or shaman) or creating various echoing effects. Rocks could also act as resonating devices that amplified the sound vibration and caused it to reverberate. In addition, the reflecting surfaces of the surrounding landscape returned the transformed sound. The ability to vibrate or to reflect vibration made these landscapes into potential sound sources or tone producers. In turn, this inevitably led to the perception of the sites being potential animate beings or their abodes. The specific location of the sacred sites served as a certain theatrical platform for ritual actions to wake the spiritual essence or concealed sound residing in that place. Sound was potentially there: it belonged to the place and was evoked or activated by singing, drumming, or other performing strategies. The sonic potential of the sacred sites could significantly impact strategies of ritual practice, including voice techniques and performing methods. Our experiments explicitly show that site acoustics could stimulate the process of setting preferences for certain sounds used at the sites (animal imitations, shrieks, accented notes, quick register switch, paused and discrete sounds or noises, low or high tense pitches, etc.), and, in addition, the specific acoustics of each concrete site could influence the use of particular sounds at that site.

A magic theatre: spirit choir, invisible orchestra, and virtual reality

In summarizing the study, it needs to be emphasized that the sacred rocks and landscapes discussed in this chapter could provide simultaneous auditory and visual experiences and events, including listening to spirits, hearing voices and hypnotic sounds, and witnessing visual illusory effects, animations, and magic mirrors (both visual and acoustic) – all of which served as evidence of the presence of sacred beings. The sonic duplicates, illusions, and distortions given off by the main responding rock and the surrounding landscape were complemented by optical illusions and transformations, and, as a result, could create a complete experience of an alternative reality. The supernatural world image created by a sacred site suggested virtual reality, complying with the Sámi depictions of the Otherworld as a mirror image of this world existing on the other side of the earth's surface, comprising more or less the same elements but in upside-down form (Lundius 1905, 6–7; Friis 1871, 112–8; Fellman 1906, 61–6; Pulkkinen 2005a, b). The audiovisual evidence described above confirms that the Otherworld became both audible and visible by means of sacred sites, contributing to the magic experience of a shaman and assistants. Additionally, given that

the acoustic and visual mirrors naturally provided by rock and water surfaces produce the most perfect reflections in windless weather condition, we could say that precisely in such moments the Otherworld would become both audible and visible.

Sacred sites as platforms for magic experience supported shamans with the essential means to enable their transformation and magic trip to the Otherworld. They simulated an alternative reality, and they naturally offered the type of absorption in virtual sound and imagery that could create the sense of a reality shift. The audiovisual experience guided the shaman to an altered state of mind by stimulating sensory organs and sharpening perception with overlapping sensory triggers. Continuous drumming and yoiking, both long and repetitive in style,⁷ already sound hypnotic in themselves. However, the use of drumming and yoiking in the acoustic conditions of the sacred sites increased their suggestive effect, provoking communication with the spirit world and a transpersonal experience and resulting in the shaman finally becoming entranced (see Video 9.3). In addition, the accelerating pace of drumming during the ritual (Tornaeus 1901, 30; Schefferus 1963, 201), combined with the simultaneous drumming of the rock in response, would dramatically increase the tempo, leading to even stronger dissociation and excitement.

Video 9.3. While drumming at rock sites, the listener can experience a hypnotic stereo effect, with the rock drumming in response. The video features a reflection of Haukkasaari rock. In addition to the double drumming effect, the sound of splashing waves can be heard. Video by Julia Shpinitskaya.

As the ethnographic records on shamanic practices demonstrate, at least two types of yoiks were involved in the ritual: a call for spirit helpers and hearing the yoiking spirits and yoiking with them while in a trance (Leem 1767, 475–80; Jessen 1767, 20, 25–6, 31; Friis 1871, 128–30; Fellman 1906, 38–9, 107; Laestadius 2000, 211–12). The site acoustics reveals that a ritual as a dynamic process could evolve through different distances (calling distance, talking/singing distance, and silent/quiet distance), which corresponds roughly to the different types of yoiks involved, contributing to the out-of-body experience of a shaman. The way in which an acoustic mirror responds can give a clue about the ritual process: a softer voice can be used when closer to the rock, while the responding echo grows stronger. When approaching the site from afar, a shaman could start calling the spirit helpers from the calling distance. As with other types of distance singing (*yodelling, kulning*), the yoiks used for calling spirits are, in fact, calls or signals projected in an intense and shouting voice (or raising voice) and done with fast, big leaps and a play of registers. This yoik type could involve bird and animal imitations, shrieks, and paused grace notes, and it would have sounded best from the calling to the talking/singing distance. In the process, a shaman heard the voices of spirits answering the calls.

As the shaman approached the site, the yoiking could change, because the talking/singing distance does not require such efforts and power of voice,

and, hence, the site's response differs. The type of voice production would vary: a voice could become lower in volume, and, when approaching the silent/quiet distance, the yoiking could become a mere mumbling in a quiet voice. Such a practice coincides with the fact that yoiking with spirits was a mumbling or whispering type of yoik. Also, beginning with the talking/singing distance, a talking or singing voice would receive an aftersound, a sonic train, as if a spirit was joining the shaman in yoiking. Approaching the site for the shaman would mean approaching the spirit (or the spirit approaching the shaman) while hearing his/her own voice coming from outside his/her body. The experience of the spirit coming closer and closer (or the spirit's voice sounding stronger and stronger) would end with the shaman falling into a trance: at the point where the echo disappears, the spirit would become one with the shaman.

In this light, the sacred sites intended for ritual actions could be interpreted as stages for magic theatre, where sound is used as a magic tool to evoke the sound of a place (and the spirits residing in that place), and, therefore, reveal the supernatural world. The sound could be sent back to the sender (the shaman and his helpers) or further to the listeners in other locations, copied, modified, transformed, and multiplied by the site echoes; in the meantime, the shaman would appear much like a conductor of an invisible choir and orchestra of spirits, interacting with them, or singing, talking, and drumming together with them. In a way, the whole audio experience can be associated with immersive sound, surrounding the listener and coming from multiple source points. At the same time, sacred sites are seen as places hosting illusory visual resources that could inspire an experience of the sites and magic places.

Concluding the study, let us emphasize that the sacred sites with their massive lakeshore rocks are places that create staggering sound and visual reflections, generating virtual mirror images of the audio and visual objects in the real world. In the shamanic context, these reflections could create auditory and optical illusions of spirits or animate beings present and becoming apparent at the sites, which served as borders where the two realities meet. Finally, the reflections could create an integral or complex illusion of a whole virtual world situated behind the rock or water surface. That mirrored virtual world closely resembled the real world, but the virtual reality displayed at a sacred site with all the above-mentioned audiovisual distortions and transformations was never an exact copy – instead, it was evidence of the existence of the magic world.

The audio and video examples can be accessed via the book's product page on Routledge.com: <http://www.routledge.com/9781032036304>

Notes

1 The most obvious difference is that the Sámi offering sites do not feature painted images. Also, the types of sites can sometimes differ.

- 2 Alternatively, these *Sacred Mountain Spirits* could be called *Sáiva lodde*, *Sáiva guli*, *Sáiva sarva*, *Sáiva olmaj*, and *Sáiva neida*. The word *sáiva* referred, in Southern Sámi areas, to a mountain, and, in Northern Sámi areas, to a lake inhabited by spirits (Pulkkinen 2005b). Moreover, local names for similar types of underground beings were *kadnihah*, *gufihtar*, *ulda*, and *čähkalakkis* (Pulkkinen 2005a).
- 3 The historical accounts often fail to mention where exactly the described shamanic séances took place. In the following two paragraphs, several such accounts are summarized.
- 4 While ethnographers generally used the Sámi word *sieidi* to refer to a sacred stone, rock, mountain, or place, the Sámi primarily used the word *sieidi* to refer to the spirit residing in that specific stone, rock, mountain, or place (Charnolussky 1966, 308; Shironina 2009, 34, 62, 183–6; Likhatchev 2014, 220–1; Bakula 2017, 73).
- 5 The exact distance depends on, for example, the air temperature and characteristics of the given sound signal.
- 6 This effect requires some small waves or ripples: the water's surface must be shimmering and rippling to cause such reflective movement on the rock.
- 7 Yoiking, as such, is a continuous and open form that can evolve over a long period of time and stop at any moment.

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