

Archiving the soundscape

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Abstract

Environmental sound recordings that fall beyond the scientific preserve of wildlife studies or the focus of ethnomusicological research, often lie abandoned, unrecognised as a resource in the study of our relationship to the soundscape. This paper explores the viability of an international environmental sound archive, using threatened musical and phenomena as case studies to examine pertinent issues of climate change, pollution, urbanisation and evolution, and the importance of sound in culture. The paper also illustrates the need for an international database of environmental sounds, especially those recorded in detailed fieldwork, allowing for use in comparative studies and the advancement of education.

Since the innovation of recorded sound, recordings of the human voice, sounds of nature and the music of many cultures have been collected and archived. As a history in itself the archiving of these recordings has formed a source of study – reflecting changing attitudes towards each subject, as the effects of rapid urbanization and industrialization irreversibly altered the societies within which each recording was made. As each collection defined itself within academic circles, parameters were set, slowly isolating the fields of sound from each other and in the process disregarding sound recordings that failed to meet the narrow criteria that defined each subject. Among these lost sounds is the field of environmental and soundscape recordings which has gained in significance in the field of recorded sound both within areas of scientific, social and economic study and as a record of cultural significance which is establishing itself almost as quickly as its subjects are disappearing. Qualified as the arena of ‘acoustic ecology’ it is not a new field but an area that has an established history and is increasing in its importance; not only within its own parameters but precisely because of the fact that it forms a key relationship between the many other areas of recorded sound which are now so removed from each other. I would argue there is a need to establish an international environmental sound archive to bring together all the worldwide resources and studies hitherto conducted and to establish a source from which comparative studies and advances in education can progress.

[For the purposes of this paper I am adhering to the descriptions used by the Soundscape Association of Japan to categorize the sounds of the environment in the conservation programme of 100 soundscapes of Japan. These sound categories are as follows:

Living things – birds, insects and frogs, the voices of creatures in their habitats. This also includes the category of plants – e.g. the sound of plants on the wind in local symbolism.

Natural phenomena other than living things – land water, rivers, falls, seas, etc.

Daily lives and culture – festivals and other events-bells, industry, transportation and other elements of historic sound culture- e.g. suikinkutsus (sound sculpture) and wind bells.]

To begin this paper I would first like to establish the position of environmental sound recordings in relation to existing collections of archived sound. Taking the collections at The British Library Sound Archive as an example, existing categories are as follows: International Music, Wildlife Sound, Drama and Literature, Oral History, Popular Music, Western Art music and Jazz. The recordings that fall within the field of environmental sound and soundscape bear closest relationship to the first four collections, appearing to overlap within several categories. Examples of elements that appear in each collection are as follows: naturally occurring musical sound in international music; rural and urban atmospheres in wildlife recordings; ‘ear-witness’_ accounts in oral history; sound art in drama and poetry.

For the purpose of this paper I would like to consider the relationship of soundscape and environmental sounds more specifically to the first two collections with which I believe it has the closest scientific and cultural relationship and of which I have the most direct experience.

Wildlife sound recordings and the soundscape

The words ‘acoustic ecology’ would suggest a strong correlation with ‘wildlife sound recordings’ as the study of the natural environment is included in wildlife research. The organisation of wildlife recordings begins with the identification of species and patterns of animal or bird behaviour. For example, recording the sound of a bird in its mating

season and the analysis of that call has been the object of study for many years. Recordings of most major species now exist in collections around the world (Alström & Ranft 2003), about 0.5 million, covering nearly all the birds and known mammals. These result from 'systematic collecting of recordings from the 1930's to date' (Ranft, 2001). When considering how much importance is stressed upon the study of wildlife and its habitat it seems strange that so little attention has been paid to the recordings of humans and their relationship to the sound environment.

Soundscape recordings appear regularly throughout the wildlife collections although their inclusion is often incidental. Many wildlife recordings are made using equipment such as the parabolic reflector which isolates the call from its background so as to make the study of that vocalization easier. However at the end of each recording a 'wild-track' or picture of the sound environment within which they have been examined will be made as a reference to be used as part of the analysis. Here the atmosphere or soundscape is recorded to provide a location - near a river or in contrast to a motorway - to further clarify the context within which the vocalization is performed. The study of habitats are an important element of wildlife recording, revealing invisible boundaries formed by a bird's acoustic range or how an animal responds to the acoustics of a particular environment. The study of urban environments is a less familiar context within which wildlife recordings are made, but nevertheless appears more frequently within sound recordings as urbanization encroaches into the field of wildlife studies and the subjects adapt their behaviour to cope with the human habitat. But the point at which human involvement becomes the prime factor in the wildlife sound recordings is where environmental sounds depart from the realm of wildlife research. In a collection of wildlife recordings those that feature human involvement are often discarded as there is no arena for studying the relationship between humans and environmental sound.

In addition, the recordings of individual acoustic events such as storms and waterfalls appear in the collections of wildlife sound archives, however these are considered mainly within the scientific context of acoustics and climate. Therefore the cultural importance of such events is largely missed. The effect on man from the sound environment and the effects of social, economic and climate change on the acoustic habitat can therefore be seen to be poorly represented, even though the effects are irreversible in many cases.

International Music and the soundscape

Departing from the realm of wildlife studies the next area within which environmental sounds and the soundscape can be found to have relevance is that of International Music.

Man has always had a direct relationship to the land and this is borne out through the customs, religious practices and traditions of many different countries. The polytheistic worship of nature within Shinto belief systems and the rituals of the Zoroastrian faith that celebrate the seasons and the main agrarian events with official ceremonies and sacred sanctions, are just two examples. These relationships are often studied through the songs and music of each culture and it is here that the importance of archives becomes clear.

A large part of the collection of early recordings of international music consists of commercial recordings that were made in order to increase the sales of gramophone machines and records throughout the world (Vernon, 1993). These have become an important record of musical traditions, many of which have changed or disappeared as a result of the processes of acculturation and socio-economic changes [which are also prominent subjects in the study of soundscapes]. The vast collections of work songs from different peoples often feature references to the rhythmic nature of work practices, as Gregg Wagstaff noted in his research into the sounds of the tweed makers in the Hebrides (Wagstaff, 2002). Their waulking songs would be performed to the rhythm of the men and women working the wool. These songs and the clatter of the loom were sounds of everyday life before the impact of mechanization and economic change drove this sound from nearly every house on the island of Harris and in the process irrevocably altered the soundscape. The sounds of the natural environment also appear in the rituals of many cultures. For the people of Guadalcanal in the Solomon Islands the sound of the wind as it passes through the 'ghau kilori' - an aeolian organ that is constructed as part of a funeral rite where the body is committed to the sea - bears great significance.

"The sound of the Aeolian organ was thought to call the spirit of the dead man back to his village before it went to dwell in the island of Malap, situated off the southeast tip of Guadalcanal."

Hugo Zemp (OCORA OCR74)

Recordings of this beautiful instrument, which features four bamboo canes measuring between 5 and 7 meters tall and with holes cut into them through which the wind blows, can be found on an OCORA record of traditional music. This label frequently features recordings that include the soundscape and

environmental sound. In addition, if you listen to the sound of the funeral songs on this record you can hear the women's voices echoing the sound of the wind and the rhythm of the waves.

Parallels between ethnomusicology and the study of soundscapes can be drawn from the fact that neither can be seen as a singular discipline as it combines the elements of many others:

"It is equally uncertain whether ethnomusicology is a separate discipline, requiring its own rationale, methodology apparatus, courses, curricula, and learned societies or whether it is indeed simply a field of interest and an activity that draws its adherents from a number of recognized disciplines – musicology, anthropology, folklore, linguistics, psychology and others."

(Nettl, 1980: pp 1-9)

The term 'ethnomusicology' has only been in existence for about 50 years although activity in the field began much earlier. Like the study of soundscapes, ethnomusicology has its roots in the existence of valuable descriptions of music in the historic annals of missionaries, travelers and civil and military officials. Murray Schafer and the World Soundscape Project demonstrated this with their collection of historic references to sound in literature, described as 'earwitness' accounts.

Furthermore the direct correlation between natural sound and music can be found in a wide range of instances from different forms of programmatic music - that is music of a narrative or descriptive kind (R. Scruton, *New Groves*) - to the influence of rhythmic elements in nature upon meter and structure in music, as noted by Stephen Feld in his description of the *dulugu ganalan* "lift-up-over sound" structure in Kaluli songs of Papua New Guinea:

"Even when the situation involves a single voice, the sound is coordinated with the surrounding acoustic features of the environment;"

(Feld, 1984: pp 383-409)

Within both the fields of wildlife sound and international music the availability of recordings with which to compare and study the influence of environmental sound on each subject have proved a useful resource and one which I believe should be available to those studying the soundscape and environmental sound.

My interest in environmental sound relates in particular to naturally occurring acoustic phenomena that appear in local mythologies, thereby directly informing traditions and beliefs. This can be understood in reference to previous soundscape studies in terms of 'soundmarks' (Schafer, 1977), a term defined by Schafer as a distinct foreground

acoustic feature uniquely defining a time, event, culture or place. It is here that there are to be found many 'disappearing sounds' – those that are adversely affected by climate, urbanization, pollution and evolution but above all by the slow increase in the disruption of the soundscape. It is this area that I wish to explore within this paper through the search for musical sands in Asia.

Sounds of the Sands

From the simple to the more exotic the sounds of the environment have influenced many cultures, shaping their daily routines and colouring their beliefs. One example is that of musical sands which have surfaced in travelers tales throughout the centuries:

"At times sad and plaintive notes are heard and piteous cries, so that between the sights and sounds of the deserts, men get confused and know not whither they go. Hence there are so many who perish in the journey. But it is all the work of demons and evil spirits."

Hiuen Tsang (A.D. 629)

From accounts of the ancient pilgrimages of the Buddhist monk Hiuen Tsang to the more well known adventures of Marco Polo, the loud and thunderous musical noises emanating from deserts around the world are one of the enigmas subject to legendary status among some desert peoples. A subject of fascination that has captured the imagination of many scientists and explorers alike. The haunting call of the desert sirens we now know is not the call of a desert genie or lost army but the sound of a particular geological phenomenon – booming sand - which also occurs in a different form on beaches, known as singing sand. These musical sands occur throughout the world but are now considered to be a disappearing sound.

References to the musical sands have appeared in many historic literatures but it is in East Asia that they are still celebrated within the cultural traditions of Japan and China. I traveled to both countries in the Summer of 2001 in the hope of capturing recordings of these sounds and raising them off the pages of history before they could disappear forever.

In Japan the musical sand is found in the form of singing sand beaches which at one time surrounded much of Japan's coastline. Now the beaches are limited to just a few which fall under the protection of the conservation programme of '100 soundscapes of Japan'.

The project, which occurred over a period of 3 years, was carried out by the Environment Agency of Japan with the Soundscape Association of Japan under the title "100 Soundscapes of Japan: preserving

our heritage". The project's intention was 'to select 100 soundscapes from those elected by citizens and local government, that were considered to be significantly meaningful sonic environments'. It was in essence a strategy for understanding natural sound as cultural sound.

The beaches that were included in the selection were identified by the eminent Professor Shigeo Miwa, some thirty years earlier. His research into the musical sands has generated the largest collection of musical sand samples in the world which are housed in the Sand museum in Nima near Kotogohama beach. In the process of collecting the sands Professor Shigeo Miwa began researching historical references to them during which he came across local mythologies and poetry. The sounds of the beaches have been compared to that of the Japanese zither the koto (commonly referred to as a harp), which begins the name of the two beaches that I was to visit: Kotohikihama in Amino and Kotogohama in Nima, where the sand museum was built and which is where the following folklore begins.

"Long, long ago, there lived a blind man and his daughter called Koto Hime (Harp princess). Koto Hime's father was a famous koto player in the Taira family, who were facing defeat in a bloody battle with the Minamoto family. Koto Hime inherited her father's unique musical talent for playing the koto and learned from him a secret melody. Desperate to save his beloved daughter, Koto Hime's father helped her to escape from the battle in a small boat. The boat wandered at sea for 3 days until it encountered a large storm which tossed and beat the small boat until at last the boat was destroyed in the furious sea. Koto Hime clung to her koto as she fell from the boat and was eventually washed up on the beach dead.

From the day that his daughter set sail, Koto Hime's father waited anxiously for news from her. After the war ended he began his search for his daughter wandering up and down the coast in the hope that she had landed safely in one of the villages by the sea., until one day he arrived at Kotogohama beach. As he walked along the beach he thought he could hear the sound of his daughter playing the secret melody. He asked some of the locals if they knew where she was living and was broken with grief as they told him the story of the girl who had been washed up on the beach clinging to her koto and whose soul they believed to now haunt the sands. So it is said that the sounds of the sands were the sounds of her spirit, playing the secret melody."

This story relates to the epic 'Heike Monogatari' – a tale which told of the tragedies and victories during the battles at the end of the Heian period (794–1192). The particular battle that the Koto Hime story refers to, the battle between the Minamoto and Taira clan, reached its climax in the naval battle of Dannoura which took place along the coast from the singing sand beaches. The Heike epic was traditionally recited by guilds of blind monks to the

accompaniment of the biwa (lute) and includes the use of programmatic music to describe the battles contained within its repertoire. At the height of its popularity there were many versions of the Heike epic which were later refined into a single version that was recognised as standard (Guignard, 2002). Perhaps with further research it would be possible to determine if there are any passages in local versions of the 'Heike' which relate to this story of the Koto Princess or any traditional compositions for the koto which describe the sands.

For anyone who has heard the sound of the singing sand they will know that it is quite hard to equate the sound, which at times can appear like a barking noise, with the gentle notes of the plucked string of a koto. Perhaps there was more variation to this sound in the past. The fact that different locations and different levels of contamination can affect the frequency of different sands could lead one to imagine there could have been a situation where more varying sounds were produced. The sounds can be affected by tiny differences in force and attack that are difficult to measure, which is perhaps why the study of the acoustic properties of this sand are conducted in the main under scientific conditions, where controlled experiments can reproduce conditions to determine exactly how to change the frequency of the emissions. However this does not deny the interest in such change of frequency beyond the scientific sphere.

Through scientific study it has been determined that the presence of acoustic emissions from singing sand is a good indicator of the level of environmental contamination, making the sounds of the singing sands a good omen. The inclusion of the singing sand beaches in the '100 soundscapes of Japan' conservation project was beneficial on the one hand in that great efforts have been made to preserve the beaches from sea pollution which affects its ability to sing, but by drawing attention to the phenomenon it has increased the pollution from tourism on the other. The destructive effects of tourism are obviously not something specific to Japan. In fact within this culture, which holds great reverence for its landscape, the effects can be much less catastrophic than in a developing country like China where the success of tourism is bringing huge benefits to certain areas that are suffering economically. As a result it is the environment and traditional elements of culture that are paying the price.

Legends of the booming sands

For many centuries tales of the East were received in the West filtered through the eyes of travelers. The works of Marco Polo were for many years considered among the most important discourses on Asia. The most famous reference to the booming sands is to be

found in his description of the Desert of Lop in Western China:

“When travelers are on the move by night and one of them chances to lag behind or fall asleep or the like, when he tries to gain his company again he shall hear spirits talking, and will suppose them to be his comrades. And in this way many have perished....And sometimes you shall hear the sound of a variety of musical instruments, and still more commonly the sound of drums.”

Marco Polo (1254-1323)

The number of local legends that relate to the booming dunes are as many and varied as the sites themselves. The largest known site of booming sand dunes is the Badain Jarain desert in Inner Mongolia which was where I was to travel to next with experts from China’s leading desert research center in Lanzhou.

Seeking legends

The remote location of the Badain Jarain desert in the heart of Inner Mongolia, means that the journey to it is a long and arduous one. Situated in an area that has only been open to foreigners for the last 10 years it is rarely visited and so it lies pretty much undisturbed. The giant dunes, which are the source of the booming sounds, rise out of the desert like a mountain range. Known as star mega-dunes, which at their most powerful reach 500 metres high, they create valleys of silence in which the slightest sound travels for miles. We set up camp in the shade of a small oasis at the foot of Baorittaolegainuoer a 230 meter high star mega-dune and one which was reputed to have the greatest sound for miles around.

It was while we sat to catch our breath that we heard it – a soft drone from the sea of sand - natural booming. The sound grew slowly forming a pure tone, a bass tone, haunting and clear. The desert siren called us and like fools we left in a hurry to seek the source of the sound. As fast as we walked towards the sound it always seemed to be coming from higher and further up. I clipped my binaurals above my ears and laid my head to the ground as the flies buzzed around me and listened carefully. It is a low deep bass more pure than the dub from a reggae sound set and with a greater range of audible harmonics. At moments it could appear like a choir of voices or the resonant vocals of an overtone singer (höömii). In the quiet of the desert its voice was clear, an unearthly musical sound that filled the air with a magical atmosphere.

Some say that the desert is haunted by the sound of the ancient bell of a lost city and some will tell that it is the sound of warring armies buried under the sand. The legend surrounding the booming sands in the Badain Jarain desert bears many similarities to other stories about booming sand sites throughout China. The booming emissions are usually attributed

to the sounds of people buried by the sands - from the villagers celebrating a festival in Shapotou (Shuoyangcheng) to the monks reciting their Buddhist chants in the Lama temple (Yonkezhao) at Xiangshawan and the drums of the armies of the Tang dynasty female general Fan Lihua. [These stories are collected by Professor Qiao in his book on China’s deserts.]

It is highly probable that the legends of the booming sands appear as folksongs in Chinese and Mongolian traditional music. However the identification of such songs may well have been hampered by the effects of communist ideological restructuring in both China and Mongolia. The synthesis of diverse ethnic musical traditions into a single unified ‘socialist’ and ‘national’ identity resulted in many local musical traditions disappearing. (Pegg, 2002: pp 1005). Among the musical styles that survived the purge is höömii (overtone singing) which has a myth of origin among the Western Khalkhas of Mongolia, that describes a relationship between environmental sound and music.

“ Their district is bordered on the west by a range of Altai mountains, including Mount Jargalant, and on the east by a huge lake, Har Nuur. Mount Jargalant, they say catches the wind coming from the east, creating a drone that crosses their area and is then swallowed by the lake.”

(Pegg, 2002: pp1009)

The idea that the booming sands could have generated their own unique musical influence on a vocal style or a programmatic instrumental interpretation seems feasible. In addition, considering how prolific the booming sand sites were at one time throughout China the possibility for a range of interpretations exists. With further research the importance of the booming sands on the music cultures of China and Mongolia could well be established. Meanwhile the sounds of the sands continue to disappear as I found when we arrived in Dunhuang – the site of the ‘Mingsha Shan’ singing sand mountain.

Lost sounds

Dunhuang has occupied an important position in Chinese history. Its strategic position on the ancient silk route – where it formed the point at which the Northern and Southern routes of the silk route converged - meant it became a cultural center for Middle China.

Dunhuang is also home to one of the most well known sites of booming sand in Chinese culture. Every year on May the seventh people come from all over China to slide down the dunes in the hope of making them boom. The dunes stopped making a sound around 1982, however the Chinese tourist board continues to profit from the legends.

In Dunhuang the amount of tourism has introduced a pollution problem, camel treks and golf cart buggies and airplanes flying over the dunes to drop parachutists, along with the high level of pollution from the coaches and cars that bring the tourists to the Mingsha Shan mountain from dawn to dusk have polluted the sand. Dr Qiao suggested it would take at least 3 years for the sand to clean itself - which invariably it does - and for the sound to return. Aside from the pollution however, the constant peal of loud hailers, the cries of stall sellers, and the chug of golf carts banishes all the peace and silence of the real desert making the possibility of anything being heard unlikely anyway. Protection for environments like these is something to strive for but when there is economic pressure in a country of billions the environmental sound heritage is one of the last things to be considered.

China's relationship with its deserts is not an easy one. Professor Zhou informed us of the problems of desertification and China's interests in stopping or controlling the encroaching Gobi desert. The government budget for the Institute of Desert Research has been multiplied 20 times in the last 2 years and much of the research revolves around preventative measures like planting trees and studying the effects on arable lands. The problem is worst in the north and northwest and the resulting sandstorms that blow through Beijing in the Spring prove that the deserts are on their way whether the government likes it or not. The impact on the rural population is destructive as whole communities are moved into new farming practices and / or out of the fields and into the factories. A way of life is being affected by environmental change impacting on the social and economic practices of a population.

The irony remains that as the musical sands are losing their sounds the sand itself is gaining territory inch by inch and day by day. It is more than likely that enigmas of sound like that of the booming sands will lose their fascination as the attitudes towards the deserts change from a source of wonder to a source of threat and their wonders will cease to be celebrated. I hope to return again soon to China to explore the sands and the cultural implications of the sands upon the current society. However for the meantime let me conclude with the argument for the need to establish an international environmental sound archive.

Resolutions

To begin with perhaps I should explain that the study that I made of the musical sands would not have been possible without the support of the Winston Churchill travel fellowship which provided me with the funds to make this fieldwork study. At the time of my initial research there were no recordings of the musical sands of Asia available in

the West. Since my journey Shigeo Miwa has mounted a sample on his web-site so that people can hear an example of this sound. The comparisons between sound available on the web at the moment and a 48khz recording need not be mentioned here; but suffice to say that for anyone wishing to conduct research using spectrograms and the like it is not such a great option. Without the funds to travel and make these recordings specifically I would still be none the wiser. In practical terms fieldwork like this is not an everyday option and for many soundscape studies just being able to locate recordings of these phenomena to prove their existence would have sufficed. But being able to hear the sound in real life through an independent internationally connected environmental sound archive would have been the ideal.

Since the beginning of the study of soundscapes in the late 60s many countries have developed their own approaches and responses to the issues of soundscape study. In countries where archives have already been collected it has allowed for comparative studies- listening to the change in the soundscape - and the field is constantly growing. The uses of such an international network will grow and so I believe it useful to consider the options at hand.

There are several models for international or local networks being tried and tested at the moment within the field of archiving. Starting with access to archives on a local scale one example that is on trial at the British Library is run by JISC (Joint Information Systems Committee for the UK). The project in question is called CNI (Coalition for Networked Information) - Institution Wide Information Strategies. On a basic level it is an experiment to connect specified Higher Education institutions with the collections at the British Library - thereby extending access from the current centralized source though recognised HE institutions - a system that reflects the current Inter-library loan system.

This involves several key strategies which include:

- The digitization of items currently held in the collections so that they can be viewed in remote locations. This material is being digitized on request and will hopefully be added to as the current digitization programmes operating within the Library build their data archives.

- Issues of safety while in transit via the internet are of great concern and are being addressed in experiments at M. I. T. [Massachusetts Institute of Technology] and other large institutions concerned with international networking on the global scale. (The whole debate around the encryption and safety of data in transit is one that I am sure will continue, but with so much market interest involved it is likely to bear a positive outcome sooner rather than later.)

This model suggests links between existing HE institutions and archives implicating education as the highest beneficiary, an important strategy when considering the future of soundscape study.

However access for all would be the ideal - and it is - but I am simply using these models as examples to raise pertinent issues which need to be considered when archiving sound recordings and the setting up of a secure network system. What it does highlight is the need for safe and recognizable authority controls needed to access this data. The use of recognised institutions allows for the protection of server and user by securing the access to the information.

Now in terms of the very existence of environmental sound archives this may seem somewhat ahead of itself. But when considering the setting up of an archive it is worth considering all the possible future implications. If the WFAE were to consider the setting up of an international environmental sound archive the first steps are much simpler and avoid engagement in some of the issues outlined above.

The best way to proceed would be for each country to first establish a record of what collections of recordings are in existence and collate this first set of information. This information could be established within an international directory outlining areas that have been recorded and when (this could be regularly updated). With this information it would then be possible to calculate costs for archiving materials and as and where funds need to be deployed / raised. Then if individual countries could establish a recognizable and secure depot the archiving could begin. I would suggest that it should be done digitally with an eye to being able to exchange information in the future via recognised centers.

One possible source for an initial application would be the IASA research programmes fund, which has supplied funds to the International Music Collection in the British Library Sound Archive in the past, to conduct a survey and research into locating existing sound archives in parts of the world which lack an existing infrastructure for archiving sound.

I do believe the success of such an application would depend on the number of countries wishing to pursue such research and it is therefore my intention through this paper to encourage discussion within the WFAE as to the future of such a proposal and hope to be able to act positively following the conference.

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