

*A Tree ascended there. Oh pure transcendence!
Oh Orpheus sings! Oh tall tree in the ear!
And all things hushed. Yet even in that silence
a new beginning, beckoning, change appeared.
Creatures of stillness crowded from the bright
unbound forest, out of their lairs and nests;
and it was not from any dullness, not
from fear, that they were so quiet in themselves,
but from just listening. Bellow roar, shriek
seemed small inside their hearts. And where there had been
at most a makeshift hut to receive the music,
A shelter nailed up out of their darkest longing,
with an entryway that shuddered in the wind...
you built a temple deep inside their hearing.*

(Rainer Maria Rilke, “*The Sonnets to Orpheus*” Translated by
Stephen Mitchell, 1985, Simon and Schuster, New York)

“In the beginning was the word...” and so begins one of many accounts of The Creation wherein the fabric of the cosmos is woven by the voice of God.¹ All world peoples from the Aborigines of Australia to the Zulu of Zimbabwe describe the beginning of the universe through sound: The totemic beings weave the Songlines across Australia; The Chameleons of Yemen and Madagascar sing into the primordial forest to bring the world into existence; the Quiché Mayan *Popul Vuh* tells of the Guacamatz—the givers of light, who consult, and while they speak their deep understanding brings forth the dawn. They speak about the forests and about the nature of life; how the waters will flow and how crops would be sown—and these things appear from their words. In the first hogan of the Glittering World, the Holy People of the Diné sing the Blessing Song from which creation emerges; and for the ancient Sumerians, the power of creation consisted primarily of the divine word. “All the creator had to do was make his or her plans, utter the word, and pronounce the name”²—a pronouncement echoed in the Koran, explaining that Allah need only

to say “Be” and It shall become—dispelling any doubt one might have in divine miracles.³

The acoustical creation of “All That Is” is implied in the word “universe” from the Latin “one verse” (a verse being a complete turn or complete idea drawn through a line of a poem). The word *poesis* from which this poetry derived is from the Greek for “creation.” Even our most advanced theories of the birth of the universe start with a Big Bang...



Sound gets stuff done. It is the perfect force for the Gods to wield, making the divine manifest in physical form. The universality of this idea is spawned by the dual nature of sound as both ethereal and visceral, and supported by our experience of the radical transformations that occur by way of sound energy. Energy borne on the wings of sound can work us on a multitude of levels; from the cognitive to the subconscious; from the emotional to the physical. It is integrally woven into our experience of the sacred, wielding profound power to affect us, while remaining something that we cannot grasp, are unable to see, and does not seem to affect the objects that surround us.

Sound needs to impinge on a living being to take effect, and the consequences can be deeply moving. Reaching into the depths of our own souls, it can instantaneously propel us to ecstasy or devastate us into dark depression. The compass of sound’s influence can be vast enough to unify nations, though its effect may also be so individually focused that the very sound that you find thrilling may cause my sadness—and then just go unnoticed by someone else.

Entirely engaged in the world of sound, we have few provisions to stop it from affecting us; by the time we plug our ears to prevent an unwanted sound from reaching us, we already know the meaning it bears. The only way we can effectively prevent sound from influencing or affecting us is by making sound that is louder, more provocative, or more beautiful—creating our own acoustical world. So it is by way of sound that we too may become creators and exercise a prerogative which continuously suggests that by “singing creation,” we, like the Gods can manifest the divine and create our own world.

In this chapter we will explore how and why we sound into our surroundings; affecting change and co-creating an environment that resonates with our needs—a common trait that we share with all sounding beings.

Some Songlines

Perhaps the clearest continuous connection to sound and creation is found in the life, culture, and language of the Australian aboriginals. Their land was created by the First Beings as they emerged from the earth to sing their way across the primordial plains; scraping deep canyons in search of water; heaving stone mountains across the landscape in conflict; weeping rivers, disgorging forests, and pushing up

hills and dunes while making love. Every feature of the landscape has a verse in their song; the paths of these totemic beings wove all of creation together on their intersecting paths before they submerged back into the Earth. Those who inhabit the land are continuously part of the evolving map spun together by the Songlines. An expecting mother, when she first feels the quickening of her baby will take notice of where she is, conferring with the elders to determine of what Songline or “dreaming” her child will be. A child of the Rock Wallaby, the Honey Ant, or Barking Lizard “dreaming” belongs to their totemic songline in a manner more cohesive than their connection to their own birth family or tribe. As they “walkabout,” they sing their songline, learn its features and legacy, and keep it alive by breathing experience and understanding into it over the course of their life. In this manner their entire world is tied together. Even those who don’t speak a common language will recognize human relatives of their own dreaming across the continent through their common song.⁴

We may feel far placed from the enchanted world of the Songlines, but we may be closer than we think. The artifacts of this reality still dwell in our own language, ready to be awakened. The very word “enchanted” conveys a great deal about the transformational aspect of even a simple song. To be en-songed—submerged within song and transported outside our mundane reality.

The singing voice is the first musical instrument used to convey emotion, and it is certain that creatures were singing expressions to each other well before any symbolic vocabulary was ever derived.⁵ The sound of song is still compelling enough to convey emotions not only across cultures but even across species lines.

To sing our experience and call out our perceptions is to live in an enchanted world. Being “enchanted” suggests being induced into a dreamlike relationship with our surroundings—outside of the perceptual constraints of linear time. We who have learned that songs are mostly narratives about certain events from particular perspectives may have forgotten that the original songs—like the songs of the birds—were used for courtship and community bonding, expressions of relationship and territory, or exclamations of fear, lust, anger, and arousal. Humans, with our mimetic abilities used singing to draw those within earshot into our song; seducing friends into our compass and animals into our lair. As we become more versed in singing, we use our musical voice to bring ourselves out into the world, harmonizing with our surroundings and those within it. Song engages and transforms the living beings around us, but the act of singing also transforms us from within (and is the only way we can touch our own body from inside). The gift of song is so compelling that when the Muses introduced singing to humanity, some people were so delighted that they sang continuously, forgetting to eat or drink. Socrates tells us in the *Phaedrus* that these enchanted souls became cicadas, given the gift of perpetual song from birth to death, honored by the Muses in Heaven on their demise.⁶

Human creation of song could be likened to a plant’s creation of flowers. A flower is a distinct expression of the plant that dwells within the seed; it is an offering to the outside world, engaging insects in the act of pollination, and seducing humans into the act of cultivation.⁷ Neither songs nor the flowers are complete expressions in themselves—they require other beings to really exist. Thus flowers

form around the desires of their pollinators with a play of light, color, shape, and odor,⁸ just as songs congeal around the emotional disposition of humans, attracting listeners' sympathies using harmony, rhythm, and lyrics. So while a song conveys a sense of the singer's emotion, it also plays upon the listener's sympathy, inducing their participation in that emotion.⁹

The human predilection of sounding our surroundings begins early on. The innocent, playful "tra-la-la" songs of the child—amusing themselves with their own sounds in their surroundings—are engagements with life in a manner that is woven into the organism.¹⁰ Their cooing and burbling is a reaching out for a response from the world. They form their own sounds around the responses they receive. Sounds that evoke predictable responses are used again; new sounds are invented to test new things. Through this singing, a proto-language emerges; a language that adults may not clearly understand, but nonetheless serves the child in connecting them with their environment. Eventually this proto-language dovetails into our collaborative vocabularies so that "stone" becomes a stone, and "water" becomes wet in our mind as well as in our mouth.¹¹ We sound out our surroundings to affirm its existence, calling things names to place them in our experiential vocabulary. We recall the names, conferring and sharing them with others. We use these common names so we can communicate and exert some control over the things we name in a world we mutually recognize. It is by way of this naming that the song of creation becomes the sounds of engagement and the vocabulary of influence.

Naming: Taking Possession of the Created

Adam's task was to name the things of creation—exhaling the breath of life blown into him to identify "every beast of the field, and every fowl of the air"—ostensibly to know them and have dominion over them.¹² This naming metaphor holds true across the breadth of human cultures, as language and sound become the medium of exchange between these experiential song-beings and their surroundings.

It must have been a delight for the first naming humans, wandering into an unsullied relationship with the Earth; gazing upon vast horizons that had never been witnessed by any other name-casters; reading the world like a new talking book whose pages were just waiting to be turned, whose sentences were anxious to be read and whose names were just waiting to be pronounced.

When these cognitive, linguistic beings formed naming relationships with the ancient world and its creatures, they embarked on a transformative engagement—a playground where the form of their surroundings became sound and meaning, which could then dance through the matrix of their ideas and intentions. To name something was to possess it in the body of the known and thus enable the namer to work with its identity. According to the holy Koran it was by way of this naming that the humans assumed dominance even over the angels (despite the angel's reservations on the matter).¹³

From where we sit now this prospect sounds frightening—having the fate of all living things at the mercy of linguistic associations invented by these clever and reckless creatures. But we are viewing the world from our modern times, when all named Things have suffered and endured many—perhaps hundreds of names by now; all not quite understood, all calling for another shot at “ringing that bell” and sounding their true identity.

The first namers may have recognized the importance of their sacred task and weighed this responsibility into their acts of speaking. If giving voice to something was a way of manifesting it into reality, then speaking a name was itself a manifesting action. This relationship between word and reality is represented throughout the histories of civilization. A good example is found in the beliefs of the ancient Egyptians, wherein the tongue was considered the steering pole¹⁴ or “oar” of the soul; the path-maker that set the course of action.

In the theology of the ancient Egyptians, the complete person constituted up to nine elemental parts. These parts included the “Body, the Mind, and Soul,” prefiguring a common Judeo-Christian tri-partite concept of the “whole person,” but they also included the Heart, the Shadow, the Personality, the Spirit, the Power, and the Name.¹⁵ Of all of these, it was the name alone that could be lost, transferred, or conveyed to others. It carried such importance that no creature, place, or inanimate thing could be said to have an existence until it was named.¹⁶ A person possessing the true Name of another could wield power over them.¹⁷

Remembering one’s true Name was also prerequisite for entry into the after-world. “Giving mouth” to the deceased was a solemn and involved procedure that allowed the desire of the heart to enter the halls of judgment. Once the heart was weighed on the tongue of the balance of life, the Name was entered into the register and they were allowed to continue on their journey.¹⁸ These ancient Egyptians apparently beheld sound as a sacred substance and affecter, believing that names contained forces that could direct, influence, heal, create, and destroy; and that without a tongue, a person was like a boat without a tiller.

The “Name” infers participation with others; only the Gods could self-create. Osiris “...brought my own name into my own mouth,”¹⁹ all other mortals needed someone to give the name—someone to know the name, and someone to behold it. True names were powerful entities, dispensed with under special circumstances to convey their power, held in secret by the namer and the named.²⁰

In consideration of this, the Word was not just a simple tool to be bandied about to represent something alive or sacred, the Word itself was alive; it was sacred. Speaking invited the exchange of possibilities. The voice was intention. Uttering these “words for things” was more than developing a representational vocabulary; rather it was more akin to setting things in motion. David Abram, in his book *Spell of the Sensuous* wraps experience and cognition around the phenomena of language and engagement, proposing that the impact of words is greater than their actual “meaning”. He argues that while words do denote specific things, feelings, or actions, it is the “sensuous, gestural significance of spoken sounds—their direct bodily resonance—that make communication possible at all...the soundful influence of spoken words upon the sensing body—that supports the more abstract and

conventional meanings that we assign to those words.”²¹ This suggests that our species’ linguistic skill is not merely a tool for conveying serial information to others who share our vocabulary, rather it is a biological adaptation, like the direction-giving dance of the bees—for weaving ourselves into our environment.

This idea of the “living word” may seem mere poetic speculation, but consider the relative impact of shouting “FIRE!” in a crowded theater situation. This benchmark in the “free speech” discussion is considered illegal because the act of shouting “FIRE!” reaches behind the reason of the listeners, biologically transforming their bodies into “panic machines” to the degree of endangering their own lives. If the huge graphic of the word “FIRE!” was displayed on the theater screen, the message would be somewhat ambiguous—unless it was accompanied by some extreme sound. Imagine what effect this projected graphic would produce if accompanied by the music of Vivaldi or the sound of church bells tolling—or maybe even the smell of smoke.

Humans are sound-specialist animals; sounds play a central role in crafting our relationship to our surroundings.²² We use sound to get things done—from hunting actions to boundary setting, from courtship to nurturing. We navigate these actions with utterances. When we—like the Ancients, call something a name, it is a testimonial to the inclusion of that thing into our realm. When they invoked names, it wove the named into an indelible bond of words and commitment to action. From a common understanding of the gravity and utility of sound, blessings and curses would set the courses and destinies of families, tribes, and nations²³; the invocation of names could summon the Angels or bring on calamity. For the Ancients, names were more than just memory devices used to navigate places and recall experiences of persons and things; names were acoustical symbols—sonic talismans that conveyed the power of legacy and recognition of the named things:

Among all the varied formulations of the First and Supreme Principal, none recurs more constantly throughout the later Vedic texts than the *brahman*. The oldest meaning of this word seems to be “holy knowledge,” “sacred utterance,” or (what to primitive man is the same thing) its concrete expression, “hymn” or “incantation.” Any holy, mystic utterance is *brahman*. But from the point of view of those times, this definition implies far more than it would suggest to our minds. The spoken word had a mysterious, supernatural power; it contained within itself the essence of the thing denoted. To “know the *name*” of anything was to control the thing. The *word* means wisdom, knowledge; and knowledge, as we have seen was (magic) power. So *brahman*, the “holy word,” soon came to mean the mystic power inherent in the holy word. (Franklin Edgerton, “The Bhagavad-Gita translated and interpreted by Franklin Edgerton,” 1972, Harvard University Press, Cambridge, MA, p.116)

Working back from “language” to “word,” into “sound,” the “Name” is imbedded into the named, ready to be set in play—by being recognized or identified by a naming being.

I was speaking with an Eyak tribal member from Prince William, Alaska. She told me that like many indigenous languages, Eyak has a diminishing number of Native speakers. Until recently in their nation there was only one Grandmother who spoke Eyak as her primary language.²⁴ Some folks are attempting to blow on the embers of their language to keep it alive—teaching the kids; writing down the

vocabulary; learning the syntax and grammar, and recording the truncated conversations. The Grandmother was not so concerned with the demise of Eyak language. Her advice was to learn how to speak a kindred language from the same linguistic family such as Diné, which has a very different vocabulary born out of a different landscape, but is nonetheless a vital and healthy Athabaskan dialect.²⁵ Once the dialect is learned, the perceptual framework of language can then be brought home and used to express the local experience. She said that as long as the land exists, the words will return.

The Persona

If the names are born out of the earth, the pronunciation of these names requires an interlocutor; a body to engage in the experience—inhaling the essence of the spirit on the wind, exhaling an enchanting voice to express the relationship—through sound—*per sona*. Without a tongue a person is a soul without a tiller. Without sound, a person does not exist, and our personhood depends on sounding it into our surroundings. Our task of engagement, boundary setting, coercion, and persuasion depends on how well we articulate these needs. Not through vocabulary, but through sound and inflection.

We can only speculate how the first name-makers sounded as they spoke; whether it was in the droll tones of a modern day telephone operator, or more animated, like the language of the birds. We don't have any voice recordings that antedate writing, but there are some clues as to how early speech was delivered, at least in literate times: Hamlet's instructions to his actors may be the most familiar observation on expression and delivery ("Speak the speech, I pray you, as I pronounce it to you, trippingly on the tongue...").²⁶ In *Rhetorica*, Aristotle also speaks in some detail about the importance of the tone, volume, meter, and rhythm of oration.²⁷ We can understand these texts in relation to our contemporary speech delivery, but neither of these literary works confirm how common parlance was delivered in their own times. We know that there was a difference between conversational speech and oration; otherwise there would not have been a need for the instructions.

The idea of *personae* was expressed in the theater trappings of ancient Greece. The "Personae" were the masks used to project the character and voice of the actors into the audience. Some of these theaters were quite large, seating thousands of people, most of whom were too far from the stage to see the subtlety of the actor's facial expressions, so the personae were used to visually emphasize the dominant emotional characteristics of the rôle in an exaggerated form.²⁸ Because the masks would otherwise cover the mouths of the actor, they were crafted to resonate and thus amplify the human voice. The mouth was always widely open or included a voice projection horn, allowing the actor to focus their voice through the mask while wearing it, animating the character with sound.²⁹ If these masks were visually exaggerated, perhaps the voice was exaggerated as well, accentuating even more the emotional characteristics of the rôle. If the voice inflections were exaggerated, how



Fig. 2.1 Greek Theater Mask Stoà of Attalus Museum (photo by Giovanni Dall’Orto)

deeply did this stylized manner of speaking reflect the depth of common conversational affectations?

We could gauge this in theory by looking at contemporary theater and live stage performance. The craft of theatrical acting is by nature a craft of carefully mediated exaggeration. An actor needs to work a finite space and expand or contract it through the inflections of their voice and actions to suit the scene. If it is done well, the exaggeration is hard to notice; done badly, it is just bad acting.

The craft of theatrical exaggeration is really distilled in Japanese Kabuki Theater and Rakugo (comic storytelling). Kabuki and Rakugo actors really push the envelope of expression of their character’s voice for a grand theatrical effect. The acting styles are expansive and musically fun (though I don’t find the embellishment too far afield from common Japanese conversational inflections). Even without understanding the language, the expressions of incredulity, deceit, passion, or embarrassment are all very clear. What is remarkable in Kabuki or Rakugo is the density and focus. A comic actor saturates their audience with an embellished delivery for the entire duration of a performance. Anyone carrying on this way out in the streets would probably be locked up.

Theater and literature are the only tangible evidence we have in determining the auditory history of common vocal expression. Unfortunately living theater is not a reliable vessel for historicity, as the rhythms and tonal inflections are mediated as much by audience responses as by artistic license. Thus the inflections mutate over time to reflect the contemporary sensibilities of the audience. On the other hand, written words more closely frame the perspective of the time they were written, which is particularly informative when the writing is traceable back to a particular author or a continuous literary tradition—such as Shakespeare, Basho, or the romantic poets of Caliphate Spain.

But prior to the convention of claimed authorship, writing was used more by storytellers to keep their story straight. And in this, the first writing forms were less linked to actual words, rather they were mnemonic devices designed to help orators track the legacy of their tales. The hieroglyphics of Egypt are representative of this, wherein pictographs emerged out of associations, which eventually became abbreviated to represent strings of sounds that could be assembled into literature or history. Contemporary Hebrew also illustrates this, in that it consists of consonants only (Latin: *con sonāre*, “with sound”). Reading silently from the page yields nonsense strings of letters; in order for it to make sense it needs to be read aloud.³⁰ (To some folks this manifests in the belief that the vowels are the spirit of the word, and thus consider it blasphemy to write the vowel into the word G_d.)

The Greek alphabet transformed this consideration with the inclusion of vowels (from Old French *vouel*, “giving voice”), permitting a solitary reader the luxury of dwelling on the page with the words, uninterrupted by the need to speak. Even with the addition of this luxury, throughout various times silent reading has been considered everything from impolite, to strange, to sacrilegious. Prior to the spread of common literacy, watching someone read silently must have been uncanny—or even worrisome.³¹ Reading silently transported a reader into an imaginary realm which they inhabited apart from those otherwise inhabiting their surroundings, inducing a form of madness. (It is this form of madness that afflicted Don Quixote, who Cervantes juxtaposed against the “wise” orality of Sancho Panza, his illiterate and apothegmatic sidekick.)³² Perhaps one of the symptoms of this madness was the way reading silently transformed the way people spoke with each other. The imagined “sound” of written language can be self-mediated by the reader within the silences of their own mind; too much of this inward dwelling without speaking the words produces an odd sounding person.

I know this from my own experience. When I graduated from high school, instead of immediately heading off to foreign lands or to university, as did my peers, I headed out into seclusion in a small cabin in the woods. Loaded with mountains of books from a summertime job in a bookstore, I spent a good amount of my time reading. Unmediated by human contact or sensible conversations, I silently soaked up fresh ideas and new vocabulary exclusively from books. Every few weeks I would return to civilization for conversation (and to do my laundry). Folks indicated that I was hard to understand, and they needed to correct my pronunciation quite a bit.

Perhaps there is some form of this madness inherent in the reading practices of literate cultures. Barry Sanders, in his book “*A is for Ox*” suggests that the ability to

dwell in the silent consideration of written ideas forms a perspective of an inner self that does not exist in oral-dominant cultures. Self reflective critical thinking is unique to those who can read and reread a composed sentence to derive or construct meaning out of it. The “sounds” of the sentence are a co-creation of the author and the reader only, elaborated internally to support a fabricated reality unique to the reader.³³ The reader can then bring these novel perspectives into the world, untempered by community discourse.

This proposal may sound absurd to someone so naturally reading this book, until you ponder the fact that among the 3,500 spoken languages at play in the world today only about 75 are literate, and that the balance of the world’s oral cultures are increasingly subject to the whimsy and wiles of the speakers of these few literate languages.³⁴ (Consider also the etymology of the word “absurd” derived from the Latin *ab surdus*—“unheard.”)

A “post modern” outgrowth of the internal literate experience is our broadcast media (theater in a dinky box), which has further modified the way we speak. We do have auditory records of this, and these records may give us some hints as to how the range of vocal expression has mutated over the brief time since the invention of sound recording. I am thinking here about “news casting” voices and the sullen gravity of Edward R. Morrow, or the paternal authority of Walter Cronkite—voices of the evening news in the 1950s and 1960s respectively. These voices worked well in their times, but I suspect that their rhythms would be too slow and their sense of drama too “thoughtful” to cut through the dazzle-haze of contemporary media where newscasters and pundits continuously break into each other’s sentences.

While the inner landscapes of reading or the framed external theaters of produced media have affected the sounds of our words and speech, I don’t think that these phenomena have changed the fundamental meaning of sounds. What remains constant over the history of human communication are the paralinguistic cues of tone, volume, meter and rhythm, which are much more evocative than a concise vocabulary. It is not the words, but how you say them that deliver the juice. People will respond predictably when yelled at; it will startle or alarm someone even if the words being yelled are nonsense. Yelling is a very blunt tonal tool and it always works (yelling faster works faster). Of course we have far more delicate tonal tools at our disposal for crafting the subtle expressions of our desire—a sensitivity that extends way beyond the mere down-lifting of a word to express disappointment, or the slight ascending of pitch at the end of a question. The rich information imbedded in the tonal stresses of our sentences may even evade conscious recognition, but nonetheless they frame our impression of what is being communicated. Tonal cues give us “hunches” or feelings of whether someone is being sincere, sarcastic, cold, welcoming, bitter, or disengaged. These subtle aspects of vocal tone are understood well enough that common computerized voice analysis tools exists that can differentiate through vocal stresses if a person is lying or telling the truth³⁵—a mechanical task that can be challenging in a live, personal encounter due to the potential conflicting evidence of “honest eyes,” straightforward body language, and a mouthful of deceitful, but sincere sounding words.

Divining the essence of the meaning of linguistic sounds, human behaviorist Fritz Pearls used a technique with his protégés that would immediately reveal the intentions behind their expression. If someone was complaining about something, for example, he would ask them to replace words with nonsense syllables and express their ideas through sounds only. Without the obfuscation of words, it would be very easy to hear if the complainer was whining, angry, fearful, or a just expressing reasonable objection to a situation.³⁶ Pearls' exercise clearly illustrates that the tone of a person's voice can convey more meaning than their words do.

Any pet owner knows this when they call, scold, or encourage their animal. Arbitrary words can be substituted for the pet's name; your little kitty "Snowpaws" will respond with the same guilty resentment to the name "Bar-stool" spoken in a scolding tone; if you beckon your dog "Storm" with the name "Artichoke," he will likely respond with the same bounding enthusiasm.

Of course the reflexive aspect of this interspecies communication is that domestic animals can use linguistic sound tools as well—in controlling the behavior of their human companions. Animal behavioral researcher Nicholas Nicastro recently realized that domestic cats use an extensive lexicon of meows, flutters, and squeaks with humans that they otherwise do not use with their kitty colleagues. Feline co-species vocabulary usually involves only hissing, spitting, yowling, and purring—basic expressions of territory and acceptance. It seems that cats are quite aware of their own species' resistance to all but the most basic persuasions. On the other hand, cats use a rich *mélange* of musical sounds on humans, indicating a much more complex relationship of interdependence and control.³⁷

It is through sound that we convey the wealth of information to others about who we are, what we want and how we feel, a characteristic that is consistent for pretty much all sound producing animals. Sound production is a means whereby creatures may rapidly modify their disposition without changing attire. In lieu of unfolding feathers, flushing complexions, modifying pigments, or even getting up into action, a single sound may unambiguously express the intent of the sound maker, immediately transforming their surroundings by announcing participation. The breadth of expression from inquiry to rage, apathy to passion can happen as fast as it takes the sound to unfurl. We make sounds that can affect incredible changes on our surroundings without our having to touch anything. We can keep people and other creatures at a distance, or lure them closer. We can induce enthusiasm and joy, dread, or fear. We direct our sounds to assure ourselves of the dimensions, texture, and density of our boundaries; we can let other people and animals know how large we are and how much territory we occupy—and how we place others in our realm of auditory influence. Through sound we create our own universe.

Bells and Boundaries

A man is fishing on the lake—well sort of fishing; actually his pole is fishing, he's taking a nap. But in the chance event that some hungry fish takes an interest in his hook, his pole will let him know, for at the tip of the pole the man has attached a

bell—now lightly suspended at the perimeter of his consciousness; standing sentry between the fate of a fish and the landscape of the man's dreams.

Bells are often found at these human intersections—helping define the boundaries and perimeters of our interests. We know how bells mark the divisions of time, metering the flow of events, but they also mark boundaries of space, the extents of territories, and the reach of will. Ranging from the 375,000 lb “Trotskoi” bell in the Kremlin, Moscow ³⁸ to the snuff-can jingles on the jingle dress of an Ojibwa dancer,³⁹ bells have served to set boundaries and attract attention, keeping bad spirits away, and calling in the community. Their role in society has been secured by the fact that unlike other musical instruments which need to be blown, plucked, fingered and navigated, bells are self contained—given a little motion they play themselves.

The archeological records indicate that the “crotal” or “jingle” bell was likely the first bell type. Derived from a seed shaking in a dried pod, these original bells were fabricated out of wood or clay, and eventually from metal. Hung around the necks of turkeys, chickens, goats, monkeys, cattle, and other domesticated livestock—animal bells served the dual purpose of helping an owner locate their foraging animals, while the alien, unnatural sound of the bell would ward off predators.⁴⁰ Similar bells adorning a dancing body would yield auditory feedback on how the body was moving—expanding the inhabited realm of the dancer out into the range of sound. So from the earliest records, the bell has served as both a perimeter and boundary setting tool, and an attracting or locating instrument.

The first cast-metal bells appeared in China c. 1700–2000 B.C.E. Legend of their use includes employing bells as long distance alarms or communication devices,⁴¹ warning of encroachment, calling in the spirits, and establishing the sphere of influence of the bell-sounding people. Through the history of Christianity, bells have served in this same manner; informing the community of various events and establishing inclusion for all those within hearing distance: It has been a long standing tradition that a Christian parish was defined by the reach of the bells.⁴²

The first bells of the early Christians were decidedly manual; they were portable hand bells that helped orient the faithful to each other in the deserts of Egypt.⁴³ Originally just calling people in to prayer, the church bell eventually evolved into an announcing tool, marking events within the day associated with the prayer times or “offices,” dividing the days and the passage of time into transitions marked by sound.⁴⁴ Prior to the mechanization of time through clocks, these temporal divisions were driven by complex interdependencies of season, weather, agrarian work schedules, holy days, sleep requirements, Roman convention, the Rule of Benedict, and the metabolism of the local priest.⁴⁵

When any population was served by a single church this worked well; all citizens were loosely synchronized to each other's circadian rhythms, tattooed by the sounds from the bell tower. But as populations grew throughout Europe, more churches, chapels, cathedrals and abbeys intersected each other's acoustical space. The Middle Ages in Europe saw such a stunning acceleration in church building that by the early fourteenth century there was a church or chapel for every 200 inhabitants.⁴⁶ With each institution ringing in their own schedules, any city soundscape must have sounded somewhat like a continuous carillon.

The introduction of the clock didn't improve things as one might expect, because the clock allowed the automatic chiming of bells without human intervention. Clock bells didn't necessarily replace the "qualitative time" rung by the church; rather it introduced "quantitative time" into the public narrative.⁴⁷ This allowed any civic institution with an interest in time to have it expressed in sound, unhinged from the temporal laws of the church. Clocks also allowed for the ringing to be staggered, offsetting any set of chimes from adjacent bells so that each set would not be masked by other bells ringing at the same time.

As cacophonous and goofy as this sounds, it is a situation that still exists in some places. On a recent trip though Mexico I stayed in a hotel on the waterfront in Mazatlan. The hotel was surprisingly inexpensive; it was only when I turned in for the night that I found out why. It was located between a small church and the harbor Customs House. Both institutions had their own clock, each with a set of bells that would ring the hours and the half hours. By some devilish agreement they both decided to disregard the convention of Greenwich Mean Time and offset their bell sets by 15 minutes to avoid overlap. Fifteen minutes is just about enough time for me to drift lightly to the perimeter of my pool of dreams... but not quite. Just as I would arrive at the gates of sleep, a peal of bells would ring out announcing either chapel time or mercantile time. I had many, many conscious thoughts throughout that night, mostly about bells, commerce, the church, and the mechanization of time. Few of these thoughts were nice...

The long association of bells with Christianity is due to Christian's extensive use of bells throughout history, but it is also likely due to how readily Christian theology resonates with the various bell metaphors: The single clapper striking the hollow metal shell—bringing it to life with a pure tone; the reach of this sound out into the surrounding void; pushing back chaos with a beautiful ringing; and calling the lost in from the wilderness. From this perspective, the sound of the bells conveyed doctrine—resonating associations with faith and spirituality.

This experience of "doctrine through sound" may seem hard to grasp from where we dwell in our modern soundscapes of rubber, concrete, and steel: surrounded by the sounds of road traffic and airplanes flying overhead; masked by the complex electronic sounds of media, and buried by our ability to produce our own deafening noises—the sound of a ringing metal bell does not seem that remarkable to us. But in the soft dirt, wood, and mud soundscapes of the fourth century holy lands⁴⁸ (when the Christian bells first sounded), the ring of a bell must have been a stunning clarion.

Empowered with the novelty of this auditory sensation, bells were easy to hear in pre-industrial soundscapes. But defining a parish as "that which is within auditory reach of the bell tower" did not end with the mere functionality of hearing it from afar. Bells invoked deep emotions, for which they were honored and thus played into a deeper sense of community belonging. The spirits of the bells were sanctified with name, purpose, and intention. They were adopted by godparents⁴⁹ and lovingly hung in amongst the family of bells that defined both the perimeter and the heart of a community, ringing out the collective sensibilities and character of the inhabitants. Given names such as *vivos voco* (I call the living), *defunctos ploro* (I mourn the dead), *pestum fugo* (I drive off the plague), and *fulgorem frango* (I break

the storm clouds) indicated the various attributes of (and faith in) the power of bells.⁵⁰ These bells were more than functional beacons conveying messages from the bell towers; they were the sound of the parish identity. Welcomed in as family members, nurtured and celebrated, the bells served as voices for the community's priorities and beliefs.

As the legacy of bells thickened over time, their complex meanings thoroughly embellished the soundscapes which they framed. The usefulness of a bell to call or alert the public—and stir their emotions—was not lost on the civic minded. Sponsored by merchants, luminaries, and trade organizations, the bells were increasingly employed for secular purposes; calling town meetings, announcing births and marriages, the opening of markets, warning of hostile encroachments, calling citizens to arms, welcoming ships and wayfarers, tolling deaths, expressing joy, signaling rest, or commemorating freedom.

Given the power of the bells to express the priorities and emotions of those who invested their faith in them, the control of bell ringing has always been a matter of contention. While the church steeple was the bell's home, the clergy didn't always control the ropes. The fuzzy boundary between the secular and the sacred was smeared around community signals of alarm, harvest, celebration, and honorary peals for civic occasions. By holding the rope of the bell, the ringer could make a statement that would set the community in motion; informed by the legacy of the bell along the course of community events. The holder of the rope held the heart-strings of the community, thickening the history of bells and boundaries with copious accounts of political intrigue, deceit, revolt, and will.

The control of the bell during the French revolution was really emblematic of this. It was through this time from 1792 through 1806 in France that the Church was ripped asunder between Royalty, the Republican Revolutionaries, and the emotional and spiritual landscapes of the citizens. In this era, thousands upon thousands of bells were silenced, abducted, dismounted and hidden—or “captured” and melted down into cannons. Once the revolutionary smoke had cleared, the return of the remaining bells was itself a painful process. Parishes and hamlets collapsed into each other, abducted bells from the center of a previous community were relocated to the centers of others, and local, regional, and national laws outlining the permissible uses of bells fueled feuds and deathly hard feelings for decades afterwards. When the bells were restored to the soundscape, their legacies and original meanings had been compromised, and their use in turn shifted to reflect a more secular society.⁵¹

Defining the center of community and the perimeter of society with sound was not limited to Christianity and surely antedates the earliest metal bells. When journalist Henry Stanley went into Africa to find Dr. David Livingstone, he was surprised that the natives knew of his arrival well ahead of time, due to the “jungle telegraph.”⁵³ And while there is no written record verifying the history of the “jungle telegraph” drums in Africa, it is likely that the earliest known evidence of tool-making hominids in eastern Africa carried with them the seeds of this form of communication.

The tradition of broadcasting community news on drums is so ubiquitous in West Africa that contemporary short-wave radio stations still use log-drum “call letters”

as station identification,⁵⁴ expanding the historic practice of keeping the news of tribal settlements in the air with a continuous tattoo of rhythms and defining the sphere of their common influence.

The sound of the split-log drum is low and large, producing a deep infrasonic energy that at a distance is more felt than heard, and with a distance-penetrating quality that is quite handy in communicating through densely foliated areas. When entering into the realm of the drums, early European travelers and missionaries often spoke about how the infrasonic pulse produced feelings of vertigo or anxiety—even while they were unable to distinguish any beating rhythms.⁵⁵ While the jungle telegraph is most often associated with the jungles of Africa, I was not surprised when I encountered some ancient log drums in the jungles of Yucatan—said to be used for long distance communication.⁵⁶

This early form of long distance communication could be looked at from the standpoint of our telephone paradigm—that when some news of interest pops up, a drummer would saunter over to the telegraph drums and blow out a few lines. But unlike the telephone, everyone within earshot of the drum was in on the news. In this sense the jungle telegraph is akin to the alpine yodeling of central Europe—a form of overland communication that was common until after WWII. Due to the huge up and down vertical efforts required to travel between the mountain villages (which may have been horizontally separated by only a few miles) pre-telephone inhabitants used yodeling to convey information across the deep valleys. While yodeling didn't have a complicated lexicon, it could clearly convey emotions.

A Moldavian Elder told me that all of the villagers could understand the meaning of the yodel due to the emotional feel of it, so occasions of marriage and birth, illness and death were all understood by the emotions conveyed through the tone of the yodel. Everyone already knew who was courting, who was pregnant, and who was frail as a matter of course; the yodel would set folks into action with invitations to weddings and christenings, or a call to prayers or funerals—conveying the common emotions that the community felt around any particular situation.

In Islam, it is the call of the Muezzin from the minaret that defines the community reach. The original tale of the first Muezzin describes a disciple of Mohammed who had a dream that he encountered a man carrying a large bell. He offered to buy the bell so that he could “use it to call the people to prayer, as the Christians did.” The man said “would it be better that I taught you to sing so that you could call the people to prayer anywhere?” When the disciple awoke, he told his dream to Mohammed. The master told the disciple to tell the dream to the Abyssinian, Bilal—“...because he has a better voice than you.” The disciple did, and Bilal became the first Muezzin, a black man from Sub-Saharan Africa.

Every Mosque has at least one minaret from which the call to prayer resounds. In its original setting this established a Mosque's sphere of influence to the reach of the Muezzin's voice. Their call to prayer is unambiguous; it occurs predictably five times a day, it serves a singular and clear purpose, though singing it requires a gift of voice. One of the beauties of this is that the call of the Muezzin cannot be hijacked to serve any other political or civil purpose. If someone other than the Muezzin was up in the minaret, it would be pretty clear who they were and what they were up to—unlike the chiming of bells, whose ropes can be pulled by anyone from below.



Fig. 2.2 Bell Yard in Hamburg, Germany⁵² (Percival Price collection courtesy of Library and Archives Canada)

The call of the Muezzin is also more centripetal than bells—it is an attracting sound rather than a boundary-setting sound. This characteristic probably has much to do with the desert geography of early Islam, where there remains a high degree of nomadicism to this day. The minaret that we associate with the Mosque predates Islam and served as lighthouses in the horizon; signal towers and beacons welcoming travelers into the hospitality of the caravanserais.⁵⁷

The “reaching out and awakening” of the Christian bells, and the “calling in and welcome” of the Moslem Muezzin still serve as dominant metaphors of these two western religions. The Jews on the other hand have not cultivated an evangelical

out-reaching practice nor an “attracting” architecture: Towers and clarion calls are counterproductive to a persecuted people. Though somewhere between the centrifugal idea of the “bells as messenger,” and the centripetal idea of the Muezzin’s “call to prayer” is the Jewish *Shofar*, a ram’s horn blown for ceremonial purposes. The *Shofar* is not particularly musical and is not played for pleasure; rather it is a signaling device used variously in the contexts of waking the people up from spiritual slumber, overcoming the forces of evil, and getting God’s attention.⁵⁸ The *Shofar* also wields supernatural or sacred power. In what is probably the most spectacular uses of sound to get something done, the *Shofar* was employed as an instrument of war by Joshua to bring down the walls of Jericho. Laying siege on the city, Joshua instructed seven priests to compass the city for 7 days blowing seven “trumpets of rams’ horns.”⁵⁹ The *Shofar* is not a pleasant sounding instrument anyway, but to the inhabitants of Jericho that week, it probably sounded really lousy.

All of the above mentioned acoustical boundary setting behaviors are in social and societal contexts which reflect and sustain a myriad of ways that smaller social groupings—tribes, families, and especially individuals, set their own acoustical territories. This is a human characteristic that has remained with us throughout time. But if there is a new textural thrust to modernity, it is the ever-increasing dominance of the individual in the social milieu. We are less subject to the societal constraints of time and territory than we were even 25 years ago. The advantage to this is that we have more personal “freedom” than in previous eras; the downside is that the reliable boundaries of social convention are now left up to each individual to monitor on their own. Dinner time is no longer at 6-o’clock; the neighborhood no longer rises with the sun or goes to church each Sunday morning. We can do these things if and when we choose, but these personal choices require us to administer the actions ourselves, without the encouragement of everyone else doing the same thing at the same time.

To help with administering our individual tasks, we have mechanized many of them. Alarm clocks, “feeding schedules,” and “play dates” are all artifacts of this. With the perimeter of our community no longer defined by city walls or the sound sphere of the bell tower, individuals are left to mediate their own acoustic territories, which we have mechanized as well—and not necessarily in a refined manner. The artifacts of this are becoming ever more contentious in modern societies; the car horn (and its idiot bastard son, the car alarm), loud exhaust manifolds on motorcycles, louder and more complex police sirens, bull horns, and behemoth car stereos—all pushing out an individual’s acoustic territory into the territory of other people’s silence.⁶⁰ This is particularly evident in America, where the cult of the individual can disproportionately supersede basic civility.

The invasion of public soundspace by personal noise is not necessarily driven by technology; rather it is driven by a need to define personal space in our modern society. This was made particularly evident to me on a recent trip to Egypt. I was told that modern Moslem cities are very noisy, and that the sounds of technology blare throughout the day and night. I assumed that western technology (having been just dropped into these ancient cities by Europeans sometime during the last half century), was handled recklessly by people who had not developed our modern

sensibilities around it. Reckless handling can be the case around the community noises of loudspeakers and industry, but surprisingly it was not the case around Egyptian personal noise.

Car horns, which I did hear continuously—even throughout the night, are used in a completely different manner than we use them in America (where the car horn is most often a personal extension of anger or anxiety). The roads in Egypt are unlike the tracks of destination found in the west; they are rather like paved “tendencies” strewn with potholes and the detritus of opportunistic use (extracting palm fibers or drying fish on the road beds, for example). As roads they are used for all manner of traffic, simultaneously displaying a 6,000 year history of transportation—from walking and goat herding to pack camels and donkey carts—all intermingled with motorized vehicles of all stripes. The cars and trucks are not expressions of personality here; rather they are more like motorized beasts of burden.

In this chaotic setting, driving in “traffic lanes” is useless, so the drivers weave toward their destination using the car horn as a courtesy signal, notifying slower traffic of a rear approach with a delicate “tap, tap” on the horn. This tapping is so habitual that even in cases where there is little risk of collision, the “tap, tap” is still expressed, sort of like a “tipping of the hat” to other drivers. Hundreds, or even thousands of these horn taps calling across the city soundscape does thicken the noise field considerably, but it is not the angry sound of car horns heard in the States, rather it is the sound of courtesy—altogether a different thing.

These western cultural perspectives on how humans sound out our sphere of influence only hint at the rich legacies found in non-western and indigenous sound-play at the perimeter of their respective societies. The rattles and bones of African Griot, the drum of Native American Medicine Man, the chants and whistles of the Sammi Shaman, and the bells and horns of Tibetan mystical healer—all use sound as boundaries and gateways between the human world and the spirit world in ways that are equally compelling and just as complex.⁶¹ This all points to a more fundamental characteristic of our species; that creating acoustical territories may be among the first expressions of human will—second only to the will to emerge from the womb.

Taking Control

An infant’s first draft of air expresses itself in sound—a cry with the power to buckle the knees of the strongest man and to loosen a flood of tears of all those within its acoustical realm. African Shaman Malidoma Somé tells us that when a child was born in his village, all of the village children would wait outside of the birthing hut. When the child issues his first cry of breath, all of the children of the village yell back in welcoming affirmation.⁶² In Somé’s culture, the infant’s first cry is reinforced by community response. But even in less intimate societies such as ours, a child learns at an early age about the power of personal sound—how sound can beckon or repel, and how sound can get everyone moving.

From the first responses we stimulate in others with our sounds we learn quickly that we can produce an impact on our surroundings without our having to touch it.

Our voice precedes us as we grow, helping us keep other people and species at a distance, or lure them closer. Through the sounds we make we assure ourselves of the dimensions, texture and density of our physical boundaries, and we can let other people and creatures outside of our visual realm know where and how large we are.

Infants are capable of expressing huge amounts of emotional information almost immediately after drafting their first breath of air, and once an infant gets a grip on their providers by way of sound, they continuously test it. They test it under varying circumstances to express hunger, solitude, physical discomfort, desire, and pleasure. Soon a common “pre-linguistic” vocabulary is established between infants and their providers with the underlying premise of “I make sound, you guys move.” The whimpers, sighs, grunts, and coos of a newborn child have the ability to summon deep emotional responses in most other sentient beings. Their sounds are so compelling that they can strongly affect all creatures within earshot, regardless of species. Powerful infant sounds are common to most breathing creatures; whimpering puppies, mewling lion cubs, whinnying foals, cheeping chicks, even a salamander pup’s squeaking are sounds that can passionately motivate adult animals across species lines.

Infant humans realize this almost immediately; what they can’t touch with their hands, they move with sound. Their first vocabulary consists of a panoply of sounds that affect others: fawning, cooing, gurgling, screaming, crying, whining, pouting, yelling, singing, even silences are used well before an infant understands symbolic or representational vocabulary. With these sound tools, the child manages to convey enough information to tailor their care and modify their surroundings for their comfort. Even as they learn words to convey ideas, they rely on the tonal vocabulary of sounds to convey those words because the sounds are stronger emotional motivators than the words alone. We continue to craft and refine our sonic vocabulary as we become more articulate, and while we may understand a conversation from the perspective of sharing ideas through words, the sound qualities we make in conversation are likely to convey the more important information—information about how we feel.

Whether we know it or not, we refine the inflections and textures of our expressions to more accurately achieve our desired results, tailored by the responses we get from others. By the time we reach adulthood, our vocabulary of subtle sound inflection is so rich that we can easily identify each other in the smallest snippet of sound. This partially accounts for our ability to recognize an unannounced phone caller on their first “hello”—even if we haven’t heard from them in years.

Subtle voice inflection so persuasively conveys personality that it might as well just be a name tag. Though unlike a name tag, or even a face, human sounds hook us into behavior. Sound conveys emotion so effectively that hearing a familiar voice immediately establishes an emotional relationship—not just a spatial or temporal one. Whether we are cognizant of it or not, most of our memory cues of comfort or suspicion, mistrust or safety—come bundled with the familiar sound of someone’s presence.

Using tools that allow us to dominate our own acoustic surroundings, we also protect ourselves from each other’s invasive sounds. We do this by insulating ourselves against sound intrusion—building our surroundings to exclude outside

sound—or by isolating ourselves from other people’s sound-spaces by withdrawal. We can distance or isolate ourselves by “masking,” or creating personal sound spaces that are louder than our surrounding soundscape. The instruments we use are the personal automobile, the personal headphone, the personal work station, the personal entertainment center, the personalized internet browser. With these tools, and the accepted social conventions that allow us to withdraw from visceral and auditory contact with each other, we are left in complete control of our personal acoustic environment. Mediated by our own will, it becomes hard to gauge the scope of any social or community interaction. Increasingly our only “community” feedback is through pre-produced sound sources—the radio or television. In lieu of dwelling within earshot of the minaret or belfry, we increasingly dwell within a personal acoustical perimeter of our own design. By taking personal control of our soundscape, we may be losing contact with our human society.

This is particularly poignant right now, because as I write this the U.S. 164th Marines are sitting in the middle of Baghdad picking the bones of conquest out of their teeth. The millions of people who assembled across the globe attempting to stop this action were dismissed as a “focus group.” Away from the plazas and parks that contained the rallies, the sounds of political unity were not heard—stonewalled by a fragmented, media-driven and screen-focused society. Waiting to hear their own voices on the radio and television, but largely silenced by exclusion; only having the polished voices of celebrity newscasters to convey some minor details of their urgent message.

So when millions of unified voices are silenced by media exclusion, the “political rally” is perhaps more useful as a unifying force for the participants, and not so much a vehicle to express ideas to a largely dumb media machine. The advent of a hijacked media actually clarifies the importance of gathering together, breathing common air, and sounding out—and listening to the scope and scale of our community noise.

Community “sounding out” was successfully used in the recent Serbian struggle for democracy. The Serbian protesters and their supporters identified themselves to each other by using whistles, which they blew to drown out the distorted state radio and television coverage. When the state television news began at 7:30 p.m., a cacophony of whistles erupted, accompanied by sympathizers beating on garbage pails and sauce pans.⁶³ The noise was so pervasive across Belgrade and Kosovo that it was undeniable, giving further confidence to the citizens in their fight for democracy.

Community sound is a great political unifier, to the degree that the form the sound takes may not be too important, just as long as it is a common sound—a sound that can be joined. In 1992 I attended a San Francisco political rally on the occasion of International Women’s Day. I usually avoid these things because I don’t really enjoy huge crowds. This event was different for me because there were some issues coming up to a congressional vote for which I felt strong enough to show my public support. Besides, as a single male I couldn’t help realize that there would be other opportunities present at a congregation of 100,000 or more people—only 10 % of which would probably be other men. So I packed my political and mercenary self onto the ferry and shipped out across the bay to City Hall.

The rally was taking place on a Sunday so there was very little traffic or building noise downtown. From the ferry docks there was a march along Market Street for some distance, and the sounds of many small pockets of sloganeering in the huge whooshing sea of mostly feminine speaking voices was itself a unique soundscape, but what I found truly unique for my ears was the circus atmosphere of the rally itself, with various orators and political speakers all trying to whip the crowd into a vociferous frenzy.

To be fair, there were actually some good speakers present—Pat MacDonald, then the president of the National Organization of Women presented a cogent and informative speech, as did Norma McCorvey, of *Roe v. Wade* fame,⁶⁴ but by-in-large the speakers who said less got a bigger rise out of the crowd. By spinning digestible, rhythmic phrases out, they could capture the mob's desire to get pumped up, to speak—or rather yell—in one voice. California Congresswoman Nancy Pelosi was just in her first term at the time,⁶⁵ and while I could see that she was not afraid to invite the crowd to join her in some serious sloganeering, her rhythm, conviction or delivery needed some work. The real *Grande Dame* of the rally that day was California Senator Barbara Boxer, who, as one of the few women in the Senate at the time, clearly demonstrated her senatorial skills by reducing the whole crowd into a huge pulsing slogan. I couldn't help think of the "four legs good, two legs bad" chant from George Orwell's rebellious *Animal Farm*.⁶⁶

At the end of the rally, the crowd broke up and the participants melted away, exhausted, catharted, and spent with what I'm sure was a feeling of belonging that lasted long after their ears stopped ringing. I realized then that these rallies are not really a good forum to feed a quest for information, rather they are a chance for a crowd to lift up their voices as one, to be heard, and to let the media, their city, and their country know what everybody already knows. Without the mob behavior, the yelling of rhythmic slogans, and the beating of drums, a rally would be ineffectual. After attending, I could only imagine an equally huge rally held in complete silence. I'm sure it would be quite frightening.⁶⁷

Of course due to the impact of these large gatherings, and the affect on unification of the spirit, the very control of these sound spaces becomes a point of contention. In the *Laws of Plato's Republic*, he scaled the size of an ideal "state" to 5,040 citizens⁶⁸—a quantity of people that could be realistically addressed by a human voice. In Plato's time the possibility of this urban scale did exist—and was close to the size of many European and American cities through the nineteenth century, wherein all inhabitants were within reach of the common soundmarks, and all soundmarks were of a comprehensible human scale.

This all changed with the introduction of the loudspeaker. Perhaps one of the most profound effects of modern technology on communication is that we can now amplify and alter the sound we make electronically. We can affect the dimension and reach of words and ideas, controlling the visceral cues of scale and importance by way of electronic manipulation. The late philosopher Ivan Illich wrote that no real extreme political dynamism had occurred for centuries on the small Dalmatian island where he grew up until someone arrived with a loudspeaker.⁶⁹ This device permitted an individual to have the power to usurp the community sound space.

Adolph Hitler himself remarked in his *Manual of German Radio* that without the loudspeaker, the Nazis would have never conquered Germany.⁷⁰

It was not only the loudspeaker that helped Hitler unify the German people. He was a talented orator, and the power of good oration is as dependant on persuasive delivery as much as it is on digestible ideas (“four legs good, two legs bad” for example).⁷¹ Hitler was a fan of high drama, grandiose pomp and fabulous spectacle. This played well into his presentations—ably assisted by Albert Speer, the architect for the Third Reich, who employed many psychological “tricks” on the subconscious to propel the Reich into mythical proportions. At the Nuremberg Rallies, his use of heavy swastika-emblazoned felt banners did more than impress the eye when they were unfurled at the arrival of *der Führer*.⁷² The stadium’s reverberant field with the loud anxious din of the crowd would suddenly become calmed as they dropped huge sound absorbing panels around the bright open stadium, embracing the crowd in a hush of felt and flannel. Feeling calm, safe and secure, the audience could open their hearts to the message of the Third Reich.

This psycho-acoustic trick notwithstanding, it was electronic technology during the Second World War that really transformed the way people perceived sound. The loudspeaker became a window to sounds from a world that existed somewhere else, in some other time. Radio studios, imaginary film sets, pre-recorded sound, and media sound production all forced a cognitive reality shift. For the first time in civilization sound originating from outside of the reach of the listener impinged on their bodies and their imagination. Through radio, a voice of authority would arrive into an intimate soundspace, bringing Theodore Roosevelt, Herbert Hoover, Bessie Smith or Adolph Hitler within reach of the average person’s living room. In lieu of gathering around the fire or in the public square to listen to the elders, by the 1930s people would gather around a radio,⁷³ sharing their common space with uncommon people.

Sound technologies allowed for the crafting of soundspace in unusual ways, producing improbable juxtapositions of sounds designed to portray emotional states rather than actual settings. The sound of twittering birds mixed in with a lovely singing voice, or the beat of marshal music behind the assured voice of a war propagandist was very effective in capturing the participatory imaginations of listeners. Soundscape coinologist, composer, and writer R. Murray Schafer frames this phenomenon quite succinctly with his term “schizophonia”—referring to packaging and storing of sounds, and the splitting of sounds from their original context to craft composed, imaginary settings.⁷⁴

This new reality was inaugurated through the radio. Soundspaces were constructed that replaced the village story teller and the town elders. A few folks could sit around a microphone and create a totally fictitious realm that a whole population could dwell in. The radio became the new church bells, if you will—which defined a metropolis as “all of those who lived within reach of the radio tower broadcast.” Many of the same metaphors and characteristics apply; the partitioning of days into time segments, the embrace of the safe and the exclusion of the threatening—the voice of a secular God from above. There is a certain hyper-believability of the broadcast voice in a produced soundscape—one which I don’t feel we will ever quite get over, if for no other reason than we can never directly question its authority, we can only turn it off. (But it goes on talking...)

Produced sound so effectively colonizes the imagination because we are not hardwired to question the authority of our own auditory perceptions. We can question the content, but questioning the acoustical cues of sincerity and intimacy requires a conscious effort. The shortcoming of radio (if you can call it a shortcoming) is that the message engages the imagination of the listeners; the listeners construct imagined bodies and landscapes around the sounds of the voice. This “drawback” is neatly addressed by the moving images of television and cinema. The word “imagination” implies an internal creation of images that inhabit a mental landscape, and sound germinates these mental images very effectively. Providing images along with the sound serves as an unyielding mold for the imagination,⁷⁵ a process that broadcast patriarch David Sarnoff introduced with the television at the 1939 World’s Fair, stating: “Now we add sight to sound.”⁷⁶ In our current, visually dominant society, Sarnoff’s statement now seems quaint.⁷⁷

The imaginary world behind the box and through the loudspeaker becomes our new “commons”—both a source and repository of common experience for large segments of society. Lured by the moving images, seduced and comforted by the intimacy of the voices, we feel that we somehow belong to that world. Serving simultaneously as the hearth at the center of our families, and signal pyres defining the perimeter of our society; the bell tower transformed again by technology.

Controlling this imaginary landscape has proven to be a huge boon to those handling the ropes. Like the ropes of the belfry, the handlers do not need to be known for their bells to ring, but unlike the bells, it is improbable that their control could be easily usurped by any members of the listening community.

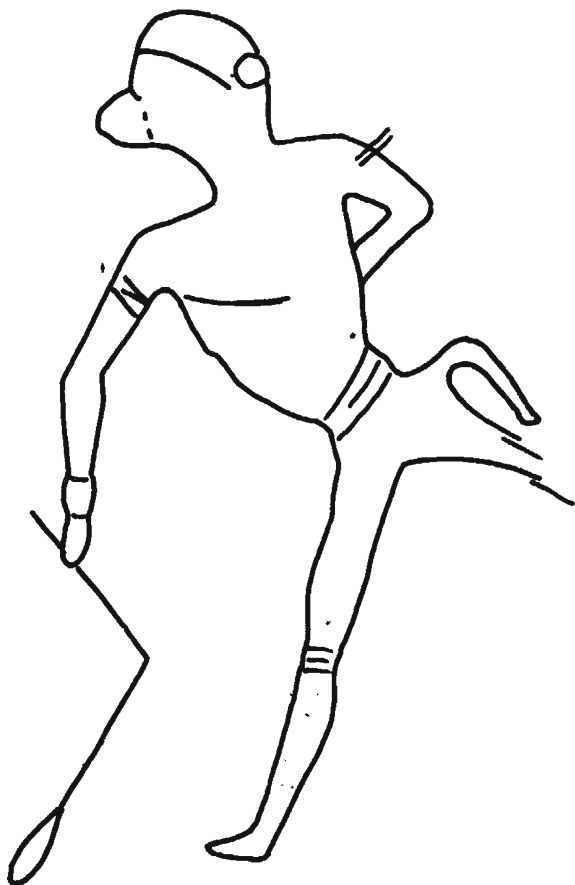
Sound and Warfare

If the intent of warfare was dispassionately reduced to a socioeconomic function, it might be described as an engagement between two competing interests wherein an aggressor throws all of their precious resources at a defender’s precious resources until one of the interests collapses. The desired objective is the economic attrition and/or defeat of spirit of the loser within the recovery envelope of the victor—to whom go the spoils. Many words have gone before this act to justify a human killing behavior that is universally decried by all societies (thou shalt not kill...) but nonetheless has been part of our humanity, even our species—as far back as time’s window allows us to see.

All manner of wiles and tools have been brought into the “Theater of War,” and while we mostly imagine war in terms of weapons that destroy life and property, the acts of war are only partially draped in maimed bodies, burned flesh, and pools of blood. Blowing up bridges and poisoning wells notwithstanding, a huge part of war involves the beating of chests and the rattling of sabers—making huge noises to intimidate the adversary into surrendering early on, postponing the inevitable blood-letting and destruction of property that actually serves nobody.

Preparations for war require unification of the warriors: Proud martial music, war dances, and drill sergeant’s measured barks all set hearts beating to the tempo of courage. Battle cries and braggadocio inspire collective confidence in the

Fig. 2.3 Figure carrying a bull roarer, the “Baboon-man” rock painting from the Brandberg, South West Africa (sketch by J.R. Harding for J. African Music V5n3)



mythical strengths of individuals, and the invincibility of the collective. Once the tears of the Mothers have been shed and the troops have been assembled on the battlefield, the real sound wars begin.

At home the “March of Time”⁷⁸ newsreels roll on, extolling the virtues of the cause, and revealing some of the more magical weapons held by “our side;” a talisman from a particular deity, a robotic soldier, a truth-finding arrow, a smart guided missile, a cloak of invisibility. Meanwhile before the battlefield the engines of war thrum and roar. We know this sound today as the deep beating blades of supply helicopters, and the thunderous scream of fighter jets ripping across the sky. These are the sounds of fear. And while the latest incarnation of these sounds impress a sense of immense power on the listening body, these types of sounds have been with us for thousands of years.

Petroglyphs in Africa and Australia dating back 60,000 years illustrate a device now called a “bull roarer.” This device made its appearance in Europe 25,000–15,000 years ago and was present in the “new world” prior to the European

invasion. The bull roarer is quite simple—not much more than a cartouche or blade of stone, bone or wood on a string. Holding one end of the string, the roarer is rapidly spun around in a circle. As the string twists from the spinning, the roarer begins to counter-spin on the axis of the string creating a fluttering sound. With some energy behind it, this flutter becomes a growl or shriek. This sound is generated from an area the diameter of the string length, creating a complex spatial signature, so the whole effect suggests something quite large and supernatural—an ideal sound to frighten adversaries and predators. The sound of one of these instruments can be eerie, but a whole infantry spinning them as they advance over the horizon was probably terrifying⁷⁹—a deep but ethereal flutter and shriek that seems to issue up from the beyond. If a defending army was not familiar with them, the sound would be particularly frightening; but even if they were familiar, the sound—like the howl of an attacking beast, would nonetheless trigger fear; the welling up of an aggressive roar into the deathly pre-battle silence would naturally amplify the terror of an oncoming threat.

The fear produced by an immense sound approaching from the horizon was a tactic that brought the Pipe and Drum corps into European battlefields. Through the eighteenth century, The Scottish Highlanders produced the sound of immensity with their “Instruments of War”—the throbbing drone of the pipes and the incisive unison lines of the chanters, fiercely driven by the ripping pulse of a battalion of field snare drums. Surely a frightening din to the foe and a bolstering of the blood-pulse for the advancing army. The encouraging music of the pipers was continued through the battle, also providing solace for the fallen. The use of pipes was so effective in war that the British government punished captured Scottish pipers as arms-bearing soldiers.

Prevailing on the Scots in 1750, the British stiffly outlawed the use of pipes.⁸⁰ Twenty years later, realizing the valuable penetrating quality of the pipes in battle, the Brits employed pipers to convey battle instructions—like the bugle callers in American infantry practice. Though in true British form, these poor souls were often placed high above the scene so as to project their instructions further into the fray. No longer just a tactical tool, they were of strategic interest to an adversarial army, and thus the pipers were often shot first.

There is an often mythologized account of Scottish bravery that describes a front line of pipers leading the infantry into battle. The myth is that the riflemen advanced up to the battle line behind the pipers and were instructed not to fire until the last piper fell. Aside from being a tragic waste of musical talent, strategically this doesn’t make a lot of sense. I suspect that this story was assembled from an instruction to an advancing Scottish army not to attack until the last of the British pipers had been silenced, rendering the Brits without a signal corps.

Subjecting defenders to new, previously unheard sounds works well as a terror tactic; few sensations will put a person’s body on alert more thoroughly than a new sound. In a pre-metallurgical era, bells, or the din of metal clanging would give a “wood and stone” army a strong case of the heebie-jeebies.⁸¹ Whistling arrows, Buzz Bombs, screaming missiles, throbbing bombers—were all noises that were initially novel to their victims in their respective times. Of course once the physical impacts of these weapons became known, their sounds become even more terrifying.

During the Blitz of London, the noise of the Buzz Bombs was as demoralizing as Hitler had hoped⁸²—in the same manner that the pounding blades of modern attack helicopters or screaming waves of attacking fighter jets erode the spirit of any contemporary defending population. The sounds of incoming ordinance—particularly supersonic projectiles and missiles—are never heard at the target, because the sound arrives after the hit. But the surrounding grisly noise of hopeless destruction saturates the nerves and sinews of the target victims, unleashing the pummeled emotions of survival; anger, fury, rage, shock, depression, grief, hopelessness, terror, and despair—a very unhealthy diet for the human spirit.

Sonic novelty always hits high marks on the fear scale, but there will always be a place for some good old-fashioned growling, gnashing, and screaming. Such is the reputation of the Viking *Berserkers* who struck tyrannical fear in their victims with berserk behavior—to the accompaniment of their animal sounds: “Sometimes I seem to hear a bull bellowing or a dog howling, and sometimes it’s like people screaming” declares a distant earwitness account from antique literature.⁸³ Explosions are unambiguous, and repetitious explosions are even more unambiguous. A relentless assault of BOOM! CRASH! THUD! BANG! destroys confidence. The louder these sounds are the more hopeless one feels in their field.

Sound is the most direct and unambiguous visceral measure of scale. We are accustomed to having our eyes play tricks on us, but our ears and bodies are hard to fool. The earth shaking rumble of huge battle machines, the dull, thick impulse of a distant bomb blast, or the sharp nasty crack of a high velocity projectile—leave no questions in the body about scale, scope, and danger of the noise source. If demoralizing the foe is an objective of war, the acoustical artifacts of conflict serve the mission well. So in these modern times of automated warfare where “surgical precision” is a proud catchword, it seems that the incentive behind maintaining a nuclear arsenal, or developing MOAB (“Massive Ordinance Air Blast”) bombs is almost exclusively driven by the BIG BOOM, rather than any strategic value of just making the biggest possible mess with one bomb-drop.⁸⁴

Of course the “Art of War” involves more than the loud pounding of chests or even the pounding of adversaries into oblivion. It also involves support through communication and surveillance. In this context, sound is the pavement of warfare. Prior to radio and satellite communications, interpreting sound cues was often the most effective method of determining the progress and nature of armed conflict. Field Marshals and Commanders kept their ears to the battlefield to determine the movement of troops, the presence of action, and the size and scope of conflict.

In pre-industrial times, gunshot and cannon fire could be easily heard over the background sounds of nature. The clatter of hooves and rattle of armor were distinct sounds that helped identify the centers of military activity, but even the silent movement of troops and the pitching of camouflaged tents and screens would transform the acoustical characteristics of a forest understory or an open grassy meadow with an aberrant acoustical texture that did not square with the natural landscape. A perceptive field commander could sit above a battlefield and derive an auditory sense of the battlefield; sensing hostile troop movement, the placement of his own troops, the lay of the forests, fields and streams, the prevailing winds and oncoming

weather—all from how these elements tempered the soundscape. The outcomes of decisive battles have been determined by how effectively the sound cues were heard and interpreted—or missed by the field commanders.⁸⁵

Warfare surveillance does not end at the battle lines. Getting behind the lines to know the enemy's perspective is one of the most powerful tools of war. When people of differing racial origins are fighting, infiltration is a challenge for the intruder; but when people of the same racial origin are in conflict, discriminating friend from foe is a distinct challenge for the defender. Historically some clever sound cues were brought into play to help with this discrimination—and the advantage of acousti-linguistic differences often played a role.

Using sound to distinguish outsiders from those within the fold is represented in the word “barbarian,” which comes from *barboi*, the Greek word for “stammering”—or “babbling,” the strange sound of those speaking a foreign language. Even when one becomes fluent in a second tongue, often the artifacts of the mother tongue remain in the form of accents—phonetic elements that do not comfortably reside in both languages. It was through this that the World War II Dutch resistance shook German spies out of their fold by maneuvering them to pronounce the name of the Dutch town of “Scheveningen.” The Dutch pronunciation of the guttural “schev” was outside of the phonetic vocabulary of the Germans,⁸⁶ whose stammering would betray their mother tongue. In biblical times this same strategy was used by the Gileadites in their war with the E'phraimites. Anyone wanting to pass over the River Jordan was asked to pronounce *shibboleth* the Hebrew word for “stream.” The E'phraimites pronounced the *sh* as *s*, thus revealing themselves.⁸⁷

In biblical times field battles were like all field battles—with opposing armies throwing bodies and blood at each other, propelled by hard objects, machines, and fear. But these ancient times were also much more a time of siege. The outlands and frontiers were ruled by brigands, thieves, and opportunists, and the cities were walled citadels that provided protection for their citizens. Scarcity and greed drove conflict. With the exception of the Crusades, wars of conquest hardly even pretended to be about ideas, rather they were about one group of folks wanting what was inside the walls of someone else's city.

Invaders would lay siege to these walled cities—sometimes for years—to appropriate the goods, kill all the men, make slaves of the women and children, and control the surrounding domains. Being surrounded, defenders would have to rely on their food stores to survive. Besiegers would set up “un-civil” engineering camps surrounding the city, building large towers and catapults from which to hurl burning objects, disease-infected carcasses, and other vile projectiles into the citadel.⁸⁸ In these settings there were three ways for the invader to get behind the walls: Over the top, through the sides (or gates), or under the ground. Scaling or penetrating the walls employed obvious offensive and defensive activities (notwithstanding the Trojan Horse stunt). Going under the walls on the other hand, was surreptitious and called on some imaginative protection measures by the defenders.

Tunnels being out of sight, defenders had to rely on sound and vibration to reveal the presence of digging. Herodotus mentions a bronze worker in the besieged city of Barca (now El-Merjeh in Libya) who used the resonance of a shield laid on the

ground to help locate the tunnels of the Persian intruders.⁸⁹ In a similar but more sophisticated manner, the Alexandrine architect Trypho determined the locations of invasive tunnels under the citadel walls of Apollonia (now in Albania) using hanging resonant vessels. Once the excavations were discovered, the defenders didn't take kindly to the invaders. Opening the tunnels up from above, they poured kettles of boiling water, molten pitch, human excrement and red hot sand into them.⁹⁰

This illustrates a bit of the gooey part of warfare and the unpleasant reality that once the conflict is over, the surviving combatants and their families are left with an untidy catastrophe of rotting flesh, festering, painful wounds, and broken souls. If somehow the strategic objectives could be met without all the mess; if I could say "Bang Bang!! You're dead!" and you would fall; only to get up when Mom calls us both in for dinner, war would not be so grisly. It is perhaps from the innate humanity in all of us that the idea of "non-lethal weapons" arises. Imbedded in this idea is a desire to "have our way" in conflict, but not have to really hurt others.

Non-lethal weaponry is not a new idea. Any conflict from shouting matches to fist-to-cuffs is a practice in non-lethality. Used most often in subduing "civil unrest," the term "non-lethal" really refers to blanket methods of temporarily incapacitating an adversary without causing permanent harm. The modern arsenal of non-lethal weapons has been cultivated by folks with a twisted imagination and reads like the contents of a "fun-bag" for a mean clown: Super sticky foams, rubber bullets, water cannons, calumet chemical sprays, laxative gas, and other niceties. Because sound is a "soft energy" it is a natural for non-lethal use.

Acoustic weapons designed to incapacitate by "acoustic trauma" include low frequency or "infrasonic," and audible band devices. "Infrasonic energy" is defined as all acoustic energy below the human ability of pitch discrimination. Quantified, it is all periodic or impulse acoustic energy below 20 cycles per second—frequencies that don't impinge on the ear as much as they influence the body. Low frequency sound saturates the surroundings and is characteristic of the movement of large things. Thunder, hurricanes, tidal waves, and earthquakes all generate deep infrasonic energy, so like the rumble of an earthquake or the deep howl of a hurricane, unpredictable noise in this band naturally triggers survival anxiety in the target subjects. This low frequency sound can also shake body and bone, resonating with organs and cavities to cause vertigo or nausea.

Some of the larger bells, and the "jungle telegraph" mentioned earlier in this chapter have caused vertigo and nausea in certain listeners. Ivan Illich mentions that the bell named St. Peter in the tower of the Cologne Cathedral (at 24 tons and 3 meters wide, the largest bell on the Rhine) caused vertigo in his colleague; "...the sound of the bell was too low for the ear but not for the guts."⁹¹ In *Village Bells*, Alain Corbin also quotes a listener; "So violently did the reverberation of all these bells agitate the air that ...those listening suffered a *sort of vertigo* and minds were distracted from any other preoccupation."⁹² What better way to temporarily disable a group of hostiles than to have them dizzy, barfing, and even shitting due to powerful infrasonic noise?⁹³

Unfortunately (or fortunately) it takes a huge amount of energy to generate the levels of infrasonic noise required to induce these effects, limiting their practicality. The sound generators need to be large, and due to the difficulty in focusing huge low

frequency noise, the perpetrators would need to have their Dramamine and bottles of Kaopectate at the ready prior to unleashing the wrath of infrasonics on any crowd.

Sounds, or rather “noise” in the range of human hearing shows more promise from a “controllable” standpoint. Loud audible noise can distract, annoy, disable, maim, or kill depending on volume, envelope, pitch, and propagation. While an entire area can be saturated with audible noise, non-target folks can stand away, wear ear protection, or leave the immediate area. These characteristics all play well into non-lethal applications. Crowd dispersal is the most obvious use, and in these dangerous times where the peaceable assembly of citizens could be construed as terrorism, I’m sure that we will increasingly hear loud audible-band noises used in this application.

Most of us are already familiar with, and have perhaps been subjected to acoustical personnel control by way of the ever more annoying and loud panoply of police sirens. Unlike the fire bells and hand crank sirens of yore which signaled right-of-way for police and firemen, newer emergency signal devices are designed to get our attention and to stun us into behaving. Typical volumes of 120 dB SPL at 10 yards⁹⁴ bark with acoustic authority. Our natural reaction is to immediately get out of the way—heart palpitating and in a cold sweat.

Extremely loud noise strips the mind of reason. The whole body reacts in a flight response. If flight is not possible, panic and terror take over. Even with ear protection, extremely loud sounds impinge on the body,⁹⁵ pushing the sensory and survival response envelope. I have willingly entered into environments (to work) where the ambient broadband noise was above the threshold of pain.⁹⁶ In both cases I had suitable ear protection, but nonetheless my work was significantly impaired by the effect of the noise on my body. I can only imagine being involuntarily subjected to painful, or ear damaging obnoxious noise—particularly surrounded by a crowd of panic stricken people who all have limited avenues of escape. One of the drawbacks of crowd control through acoustic trauma is that the responses can be unpredictable. Frightened victims may run for cover, but if the victims are already furious, they may not be so easily coerced.

A more predictable application of audio band noise—just shy of acoustic trauma, is acoustic harassment. Audible range “Acoustic Harassment Devices” are used on fishing nets to scare off marine mammal net-predators⁹⁷ (or ring their dinner bells, according to some fishermen), and you can flush out skunks and other vermin nesting under your home by playing a loud radio in their living space. A similar strategy was used a few years ago at the Vatican Embassy in Panama, when the U.S. Government wanted their errant son, Manuel Noriega, to come home. They set up a large Public Address system outside of the Embassy and played music of “The Doors,” “Iron Butterfly” and other American pop groups at high volumes, 24 hours a day for days on end. This, along with other persuasive tactics eventually flushed the despot out of the embassy.⁹⁸

In the Noriega case the Army just put up a few stacks of speakers aimed generally at the Embassy. That was in 1989. Since then, U.S. Military “psych-ops” have refined their techniques in the audible band. In addition to more powerful sound systems, the material selections have been honed; the contorted sounds of

screaming babies, rabbits being killed, and other unpleasant biological sounds come from one pallet.⁹⁹ The arsenal also includes “heavy metal” rock from AC/DC, Joan Jett, and Def Leppard—all played at excruciatingly high volumes. This characteristic American music produces another effect on contemporary combatants; the US Marines engaged in the conquest of Iraq are familiar with the music and even enjoy the themes while in battle (soldiers will pepper their battle accounts with criticisms of the music selections used by psych-ops¹⁰⁰); meanwhile, people not accustomed to “screaming spandex voices and razor-slashed guitars” have the assault of unfamiliarity to overcome.

In more limited applications such as crowd control and “Active Denial” applications, more precision is called for. Current technologies developed under the rubric of High Intensity Directed Acoustic (HIDA) devices include the Long Range Acoustic Device (LRAD) which can focus high intensity acoustical energy into narrow beams that remain coherent at 1 km.¹⁰¹ At shorter ranges of 50 meters or less, these devices can exceed the threshold of audible pain and can cause permanent hearing damage. The US Army has deployed these in Iraq and Afghanistan, and two were deployed by the New York Police Department to keep protesters at bay around the 2004 Republican National Convention.¹⁰²

All of the acoustical weapons mentioned above are used in terrestrial, airborne sound settings, but acoustical conflict is not limited to soft human targets. Much of our military engagements occur in and around the seas, and dominance of littoral waters around “theaters of war” is a key to any international military venture. Modern global conquest requires moving aircraft carriers and their support fleets around the globe. These fleets are well protected and hard to approach from above the ocean surface, but they can be vulnerable from below. If a submarine can lay in wait at the sea bottom, or even sneak up into a fleet, it can inflict huge damage on a military enterprise. Due to this exposure, contending with submarine threat has been a major thrust in U.S. Naval strategy since WWII. Whether scanning with “active sonar” or listening with “passive sonar,” anti-submarine warfare technologies depend heavily on sound.¹⁰³

Water is fairly opaque to radio waves, and it readily absorbs and diffuses light, but it transmits sound very efficiently. Sound works so efficiently in water that a majority of marine animals have adapted to acoustic perception with the acuity that terrestrial animals have adapted to visual perception.¹⁰⁴ In response to the acoustic properties of the ocean, navies have developed diverse “Sonar” technologies. Sonar—the acronym for “Sound Navigation and Ranging,” is really the only practical way vessels can communicate underwater, so it is used both to detect hostile submarines as well as communicate with allied submarines and other escort vessels. Sonar is also used by fleet vessels for other navigation purposes, such as depth sounding and obstacle detection. And in the event that an enemy submarine does sneak into striking range, loud sonar “jamming” signals are also used to thwart any hostile communication. With all of these various and sundry sonar systems in play, a marine warfare arena is an exceedingly noisy place; saturated with sonar sweeps, groans, whistles, pings, chirps, blasts, pops, snaps, and warbles. These deliberate noises ride on an already loud bed of engine and propeller

noise and hull-coupled equipment noise, so when you see a fleet of navy ships bobbing around in a bay somewhere, the marine environment for miles around it is acoustically toxic.

Transmitting air-borne sound for over a mile takes considerable energy, but sound can easily travel for miles—even hundreds of miles in water. One communication system called “Surveillance Towed Array Sonar System/Low Frequency Active” (SURTASS/LFA in military alphabet soup) is designed to transmit sound over thousands of miles of open sea from a single platform with a source noise level of 215 dB.¹⁰⁵ It is considered a communication device, but due to marine animals’ dependence on sound perception, it may function more like a weapon as far as sea life concerned; harassing, or even maiming animals at close range (within a few hundred meters) and otherwise acting as a medium-grade annoyance for all animals within a thousand mile radius.

While SURTASS/LFA was not designed as an antipersonnel weapon, the impact of this noise level on humans can be severe. Human ears are poorly adapted for underwater hearing and may endure high level underwater noise, but the human body couples water-borne acoustic energy very effectively, so the effects of this noise on the body are quite dramatic: U.S. Navy tests exposing human divers to 160 dB(re: 1 μ Pa) low frequency sound (an energy equivalent to 99 dB re 20 μ Pa in air) induced seizures and other long term physiological effects.¹⁰⁶ The military mind can take this information into all sorts of unspeakable places, and you can be assured that it has.

Sound and Healing

The words used for sound and the words used for states of health all weave through the etymologies and dictionaries together. And while “sound health” and “sound hearing” arise from different origins it is not a coincidence that sound and healing remain companionable in western languages. Sounds are used to read the health of a body when physicians palpate—tap and listen to a patient’s body to diagnose their state of health. They are listening for a “sound body.”

Sound is used to heal unsound bodies; from the calming effects of a familiar song on an anxious child, to the transformational power of the shaman’s drum, enticing a wandering spirit away from an afflicted soul.

Music is an irrefutable panacea to bring the spirit back into the body: The mother’s gentle song; the incisive rhythms of the griot; the focused oration of the cantor; and the disembodied vocal mannerisms of the shaman; these sounds envelope the listener, unifying them with their surroundings. The beat of the drum, the pulse of the heart, the flow of time: Music, like blood coursing through human experience, serves as a wayfinder for spirit and a vehicle for organic transformation.

The first healing instrument—the human voice—teaches us that sound can heal. We are calmed by the song of our Mother and assured by the voice of our Father. The power that familiar voices have in bonding us to our kin and community is probably the most persuasive argument that sound can make us whole—and heal us.

Humans have a broad range of singing and speaking voices, which we consciously use to communicate and express ourselves. But we are also capable of a vast panoply of other vocal sounds—some strange, mysterious, and unearthly. These other voices can affect us in strange, mysterious, and unearthly ways.

The power of the voice and the incantation of sacred healing words weave strongly in many sacred traditions. Sacred words and phrases, or “Mantras” are incanted to bring about results—to heal, to locate, even to destroy. This Sanskrit word is a conjunction of *man*—“intelligence” or “feeling,” and *tram* meaning the protecting power—or “wings” to both shelter and give flight to the sound.

Lama Govinda speaks of the “mantra as primordial sound and as archetypal word symbol.” Mantra formulas are “pre-linguistic.” They are “primordial sounds which express feelings but not concepts, emotions rather than ideas.”¹⁰⁷

The most ubiquitous of mantras is the sound “OM” which is chanted with a depth to encompass the extents of the creation by Buddhist monks. The *basso-profundo* chanting of Tibetan monks sung well below their speaking vocal range with an open throat; setting their entire surroundings into resonance with a sound that seems to reach into the earth’s core, generating a vast range of upper harmonics which suspend around them like twinkling stars. It is here that the cellular resonance of the body takes flight. You could apply the metaphor of the vocal cords as “plucked strings,” but this would only sketch out the obvious: There is vast power in the presence of this sound; a single voice sounds like many, a whole choir forms a thick harmonic landscape that you can dwell in. Practitioners believe that the sound of “OM” can bring enlightenment. Take a moment and try it out: Close your eyes and take a deep breath. Sing your exhalation into the round vowel “Oh.” As you sing, slowly close your lips into the closed “mmm” sound—humming to completion. After a few times repeating this I definitely feel a pool of calm that centers my busy mind. It is definitely more sensational than chanting “bac” or “pliew” (unless these sounds are your personal mantra—sounds that resonate with you specifically). In Buddhist practice the sound from which the universe is constructed holds all things together. Chanters feel that these bonds can be transformed through resonance, so delight, wrath, orgasm, healing, and enlightenment are all available in their focused mantras.

The profound power of healing sounds is also found in early Christianity, spoken by Jesus Christ himself. There is informed speculation that Jesus may have studied medicine with the Egyptians. While the ancient Egyptians are known these days for their fabulous monumental architecture, in biblical times they were known for their medical arts.¹⁰⁸ Jesus’ ability to heal by touch and sound was well established medical practice in Egypt of that time. In the gospel of Mark, Jesus was able to bring speech and hearing back to a man by grasping the man’s head with his fingers in his hears and pronouncing “Eph’pha-tha”—Egyptian for “be opened, open your ears, loose your tongue.”¹⁰⁹

Since sound unseen can compel, command, inspire, and transform, there are few cultures and civilizations past or present that have not considered sound as a healing force. Songs are offered to supplicate deities, spirits, animals, and plants—where words and material offerings won’t do. Chants and spells serve as pathways and

bridges to the realms of the felt-but-unseen. Sounds of sacred instruments weave musical landscapes into which mortal bodies can enter, dis-incorporate and transform. The body, mind and spirit naturally entrain to organically derived rhythms, giving the conscious mind relief from the navigation of the will. With this music the body and spirit take flight, and the shamanic musician can take stewardship of an individual or a community, guiding them through diverse perspectives of reality; navigating through the heavens or underworlds to encounter the iconic and archetypal forces that inform their understandings and beliefs. It is the pulse of the shaman's drum that heals, bonding the one to the many, distracting the self from the limitations of subjective reason, unifying the bodies of the individuals into the body of the community.

Shamanic cultures are by nature invested in a sensate world. These practices remain in areas where nature is clearly the dominant force and the distractions of western technology are ineffective, rattletrap, or scarce. Surrounded by the capricious and irrefutable forces of nature, the Shaman—a naturalist of a kind, sits at the perimeter of society mediating the boundaries between the patterns of social life and the mysteries of the plant and animal world.¹¹⁰ Sound is the vehicle; the Shaman's drum is often referred to as a horse that transports the Shaman between the worlds.¹¹¹ Rattles serve as a gateway—like a beaded curtain through which the healer and his patient travel; into a place where altered vocalizations speak, mutter, and growl the voices of demons and spirits. Sharp bone whistles pierce the realms of drones set down to harmonize the travelers; horns blare out to shock the perimeters—all to the steady pulse of the drum. The patient becomes saturated in a sonic fabric; heartbeat, breathing, even brainwaves entrained to the sounds of the Shaman.¹¹² From this altered state the Shaman can then guide the patient back, “reassembled” as a whole and well person. This is not “music.” They are not composed pieces one would hum as an idyll to while away the day. These are acoustical tapestries bringing the gravity of the occasion together with a deep practiced tradition.

It is in these same societies that dancing and music are often much more than just party and social activities. Rites and ceremonies keep the community blood pulsing, bringing people together, engaged in their important roles in society.¹¹³ A dance may be a celebration and at the same time be an important solemn event where specific tasks are accomplished: Youths are welcomed into adulthood; gratitude expressed for abundance; the arbiters of weather and the seasons are assured that the community still needs their mercy. In this context, the Dance brings all stakeholders together, making the many into one.¹¹⁴

In many African traditions, the Dancers are the “lightening rods” to Spirit. They invite the Spirits to inhabit their bodies and work their magic and medicine. The Musicians act as a conduit to that spirit power, grounding the supernatural energies flowing through the Dancers. It is by this manner that the music is “played” by the deities through the Dancers; manifesting the “spirit energies” into sound, driving the Musicians to connect the intangible spirit realms to the tangible world. The bodies of the dancers and the bodies of the instruments are conductors—alike in their capacity to channel this energy. The Musicians hold things in place. In the end, the Dancers and Musicians are grateful to each other for their respective roles in their

community healing. This Dance is not a performance. Unlike western dance music, the musicians are not playing “for” the dancers; the dancers are not dancing “to” the music. Rather the resonance of sound and dancing harmonizes the community. This engagement is like food—nourishment for the collective bodies and souls. Without it the community spirit will atrophy and starve.

O.K., so you might say that “these sounds do serve to unify the sensibilities, focus the intentions, and enrich the emotions of the community. In the context that all illness has a somatic aspect, these healing practices would naturally invigorate the health of all participants. But this is not brain surgery; these sounds can’t mend broken bones.”

It is true that wild spirit dancing would probably be stressful on the mending of bones, but there are sounds that do mend body and bones. It has been suggested that the purring of cats may be just that sound. Cats of course purr when being affectionate, but they also purr when giving birth to kittens and mending from physical trauma.¹¹⁵ This conjecture is supported by the fact that broken felid bones take significantly less time to heal than broken dog bones, and that low frequency vibrations in the range of cat purrs are used to heal complex fractures in humans.¹¹⁶ Purring and healing is not specific to felids; some birds, notably puffins and storm petrels also purr to their eggs, enabling them to hatch.¹¹⁷ This opens up the inquiry as to whether animals other than humans use sound as a healing energy, and if the cooing and muttering of animal mothers to their offspring serves as more than just bonding vocalizations. It fuels the speculation that in lieu of patent medicines and surgical instruments, some animals may use acoustical methods for their own health care. Given the synergistic effects of environment on health, this might be hard to measure, but interspecies sound interactions with humans may provide some clues.

There is certainly enough anecdotal evidence that dolphins produce healing effects on people, although typically not in the realms of bone and tissue repair. Dolphins vocalize in an ultrasonic range that penetrates soft tissue. They can use this sound tool to discriminate soft tissue in their prey, but it also allows them to see into the bodies of humans.¹¹⁸ The accounts of captive dolphin-human interactions are rife with dolphins identifying early-stage pregnancies in women, tumor growth, and internal prosthetics such as heart valves and bone pins.¹¹⁹ Dolphins also vocalize down into the higher end of human auditory perception, and the sensation of their voices can be quite thrilling, because when you are in the water with them, you don’t necessarily hear this through your ears, rather you hear it through your body.

I have had the good fortune of swimming with dolphins in Hawai’i and found that their audible frequency sweeps stimulated my spine as if my vertebrae were sympathetic xylophone keys being played by their voices. I also found that these encounters—in a trusting “play field” with these amazing creatures, produced a psychological effect akin to deep meditation.

The positive neurological effects of “dolphin therapy” has spawned many “dolphin healing centers” and research into the healing effects of dolphin–human interaction on neurological disorders: Autism, Down’s syndrome, cerebral palsy, epilepsy¹²⁰ and communication disabilities.¹²¹ And while just the thrill of interacting with a magnificent wild creature would raise anybody’s spirits, the effects on

brainwaves have actually induced a significant decrease in brainwave frequency—akin to the effects of self hypnosis or chemical sedation¹²²—benefits that can be traced to the consequences of the sound produced by the dolphins.¹²³

These effects may seem subtle to the allopathic healers who conceptualize the body in more mechanistic terms. The “holistic” sound-healing models hinge on the assumption that psychological states and emotional health affect the self-healing abilities of the body. But even to those who dwell exclusively in the realm of Newtonian physics, sound nonetheless does have a role in medicine. In its most basic form, any medical doctor will listen to their patient with a stethoscope, and palpate the patient’s body to check for inflammation and fluid-saturated organs. Ultrasound, or high frequency acoustical energy is commonly used for internal imaging, and it is occasionally used in the form of microwave heating to warm up organs and joints—stimulating circulation. High energy ultrasound is used for surgery to break up gallstones, kidney stones, and cataracts, and very high frequency sound is even used for brain surgery.¹²⁴

Of course this latter isn’t really sound, *per-se*, it is just acoustical energy. It’s not resonating or aligning anything on a “meta” level; it’s just setting cells in motion through physical resonance; burning holes and cauterizing tissues—allopathic applications of a subtle energy in not-so-subtle ways.

We can thank the dramatic successes of western medicine to its framing the body in physical, allopathic terms; where the physician takes control of the patient’s body and almost forces healing. Of course it works, and works well. But the ancient and long standing successes of healing music and sounds have been pushed aside. In its place is a more systematic application of patent medicines and a modern form of shamanism where the healers are not bridging the boundaries between the community and the mysteries of nature, rather they bridge the boundaries between the individual body and the mysterious language of science.

But “allopathic medicine” and “holistic healing” are not necessarily mutually exclusive concepts, rather they represent two healing modalities that arise from complimentary modes of human consciousness; a Cartesian/Newtonian framework where causes and effects occur in measurable dimensions of time and space, and a “transpersonal” experience framed by metaphor and perception.¹²⁵ In the former, the forces of nature interact in predictable and repeatable ways. In the latter, associations of elements, actions and consequences are more fluid. It is in the transpersonal realm where the experience of the body extends beyond its physical form and where sound at various frequencies can “resonate” the cells, “energy centers” or “chakras” of the body.¹²⁶ Sound readily bridges between these distinct realms of consciousness where quantifiable physical qualities unfold into imaginal landscapes over measurable time. There is enough overlap between measurable physical evidence and transpersonal constructs that the perceived effects are more than just metaphors. It is here where “hospital quiet” is promoted and the structured music of Mozart and Bach is played in convalescent wards to help patients heal.

Mountains of literature linking sound and healing date back through all written history. Even in our times the sheer volume of this literature is a “close second” to the volume of texts on music criticism—indicating that despite the desire to

rationalize the conditions of the body into easily solvable physical relationships, other factors still prevail. Perhaps the pivotal question of this discussion is whether our health is strictly physiological/biochemical, or whether health states—even symptoms quantifiable in strict biological terms—are somehow connected to the larger fabric of our sense of where we are. If the latter statement is true then western allopathic medicine may be selling short on the healing possibilities of sound.

Sound and Intention

Sound is the physical signature of our dynamic surroundings. Things that move produce it; things that don't move nonetheless impinge on it. Our place in the physical world is a continuous engagement with the sounds in which we dwell and amongst the sounds we ourselves create—a condition that exists even in the bodies of those who are auditorily deaf. While we are subconsciously affected by the sounds of our surroundings, we are also consciously (or unconsciously) mediating our placement in our surroundings with our own sounds. It is a dominant tool we use to get things accomplished, whether it is a simple sigh or an involved oration; a banging on the table, or the playing of a piano concerto.

As tool makers we have crafted and refined this tool. We have taken the feedback we get from our own sounds and used it to build complex soundscapes which we inhabit. It is through this that we have created an active perceptual world; the recognition of our surroundings, the responses to our conditions, the expression of our self, and the setting of our boundaries. We aspire to affect some control over that which is within our perimeters by using sound in seductive, encouraging, forceful, or subversive ways. We delight in the engagement, crafting sound into music, communication, and medicine.

This “Song of Creation” has many singers; it is infinitely dynamic and as large as the cosmos. There is some incomprehensible order to it all—some unifying factor we call the Universe.



Singing is a manner in which we can make the element of air manifest in our bodies and out into our surroundings. Our voice takes this fundamental building block of life and helps us feel its invisible form. It is no surprise that some of the most moving human transformations are wrought from the materials of song and voice. It is no surprise that the words “inspire” and “spirit” are all born out of the wind.

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