

7

The Music of the Environment

R. MURRAY SCHAFER

Canadian composer and theorist R. Murray Schafer (1933–) came to prominence in the early 1970s with a series of writings on environmental sound and noise pollution. In 1977, Schafer published *The Tuning of the World*, which presented his most thorough and cogent argument for what he termed "acoustic ecology." Inspired by the Pythagorean (and, later, Cagean) idea that the cosmos itself is a musical composition, the book looked back on the history of modern literature, music, and audio theory (Russolo, Cage, Schaeffer, etc.) and offered prescriptions for a new kind of listening to the world "soundscape," a term Schafer coined. Schafer also founded the World Soundscape Project, which drew attention to the sonic environment through location recordings and environmental advocacy. The "acoustic ecology" movement is still thriving today, notably represented by The World Forum for Acoustic Ecology and the work of environmental sound artists such as Hildegard Westerkamp, David Dunn, Douglas Quinn, and Chris Watson. The following piece is drawn from Schafer's *The Music of the Environment*, a 1973 pamphlet that presents, in distilled form, the argument Schafer elaborated in *The Tuning of the World*.

The soundscape of the world is changing. Modern man is beginning to inhabit a world with an acoustical environment radically different from any he has hitherto known. These new sounds, which differ in quality and intensity from those of the past, have already alerted researchers to the dangers of the imperialistic spread of more and larger sounds into every corner of man's life. In various parts of the world important research is being undertaken in many independent areas of sonic studies: acoustics, psychoacoustics, otology, audiology, noise abatement practices and procedures, communications and sound recording engineering (electroacoustics and electronic music), aural pattern perception and the structural analysis of speech and music. These researches are related; each is dealing with aspects of the world soundscape, the vast musical composition which is unfolding around us ceaselessly. In one way or another researchers engaged on these vari-

ous themes are asking the same questions: what is the relationship between man and the sounds of his environment and what happens when these sounds change? Is the soundscape of the world an indeterminate composition over which we have no control or are we its composers and performers, responsible for giving it form and beauty? These researches have been given an additional impetus lately since noise pollution has now emerged as a world problem. It would seem that the world soundscape has reached an apex of vulgarity in our time and many experts have predicted universal deafness as the ultimate consequence unless the problem can be brought quickly under control. Noise pollution results when man does not listen carefully. Noises are the sounds we have learned to ignore. Noise pollution today is being resisted by noise abatement. This is a negative approach. We must seek a way to make environmental acoustics a *positive* study program. Which sounds do we want to preserve, encourage, multiply? When we know this, the boring or destructive sounds will be conspicuous enough and we will know why we must eliminate them. Only a total appreciation of the acoustic environment can give us the resources for improving the orchestration of the world. Ear cleaning in the schools to eliminate audiometry in factories. Clairaudience, not ear muffs.

The following thoughts are crosshatchings on this theme designed to suggest how a new subject of acoustic design might develop, knitting together scientific discipline and artistic imagination.

The Musician is an Architect of Sounds

Throughout this essay I am going to treat the world soundscape as a macrocosmic musical composition. This is perhaps an unusual idea but I am going to nudge it forward relentlessly. The definition of music has undergone radical change in recent years. In one of the more contemporary definitions John Cage has declared: "Music is sounds, sounds heard around us whether we're in or out of concert halls (cf. Thoreau)."¹ The reference is to Thoreau's *Walden* where the author experiences in the sounds and sights of nature an inexhaustible entertainment.

There are two basic ideas of what music is or ought to be. These may be seen clearly in two Greek myths dealing with the origin of music. Pindar's twelfth Pythian Ode tells how the art of aulos playing was invented by Athena on hearing the heart-rending cries of Medusa's sisters after Perseus had killed the Gorgon. In a Homeric hymn to Hermes an alternative origin is proposed. The lyre is said to have been invented by Hermes when he surmised that the shell of the turtle, if used as a body of resonance, could produce sound.

In the first of these myths music arises as subjective emotion; in the second it arises with the discovery of sonic properties in the materials of the universe. These are the cornerstones on which all subsequent theories of music are founded. In the former myth, music is conceived as subjective emotion breaking forth from the human breast; in the latter it is external sound possessing secret unitary properties. This is the *anahata* of the Indian theorists and the music of the spheres of Pythagoras. It suggests that the universe is held together by the harmonies of some precise acoustic design, serene and mathematical. For many decades, however, it is the other view of music that has dominated Western musical thought.

This is the musical expression of the romanticist. Its tempo fluctuations, dynamic shadings and tonal colourings are the means by which the subjective and irrational art of the virtuoso artist is created.

The research I am about to describe represents a reaffirmation of music as a search for the harmonizing influence of sounds in the world about us. In Robert Fludd's *Utriusque Cosmi Historia* there is an illustration entitled "The Tuning of the World" in which the earth forms the body of an instrument across which strings are stretched and are tuned by a divine hand. We must try once again to find the secret of that tuning [...]

Clairaudience

We will not argue for the priority of the ear. Modern man, who seems to be in the process of deafening himself apparently regards this as a trivial mechanism. In the West the ear has given way to the eye as the most important gatherer of environmental information. One of the most evident testaments of this change is the way in which we have come to imagine God. It was not until the Renaissance that God became portraiture. Previously He had been conceived as sound or vibration. In the Middle East the message of Mohammed is still heard through the recitation of his Koran. *Sama* is the Sufi word for audition or listening. The followers of Jalal al-Din Rumi worked themselves into the *sama* state by whirling in mystical dances. Their dancing is thought by some scholars to have represented the solar system, recalling also the deep-rooted mystical belief in the music of the spheres, which the attuned soul could at times hear. In the Zoroastrian religion the priest Srosh (representing the genius of hearing) stands between man and the pantheon of the gods transmitting the divine messages to humanity.

When man was fearful of the dangers of an unexplored environment, the whole body was an ear. In the virgin forests of North America, where vision was restricted to a few feet, hearing was the most important sense. *The Leatherstocking Tales* of Fenimore Cooper are full of beautiful and terrifying surprises.

... for, though the quiet deep of solitude reigned in that vast and nearly boundless forest, nature was speaking with her thousand tongues, in the eloquent language of night in the wilderness. The air sighed through ten thousand trees, the water rippled, at places, even roared along the shores and now and then was heard the creaking of a branch, or a trunk as it rubbed against some object similar to itself, under the vibrations of a nicely balanced body ... When he desired his companions, however, to cease talking, in the manner just mentioned, his vigilant ear had caught the peculiar sound that is made by the parting of a dried branch of a tree, and which, if his senses did not deceive him, came from the western shore. All who are accustomed to that particular sound will understand how readily the ear receives it, and how easy it is to distinguish the tread which breaks the branch from every other noise of the forest ... "Can the accursed Iroquois have crossed the river, already, with their arms and without a boat?"²

The Rural Soundscape

When men lived mostly in isolation or in small communities their ears operated with seismographic delicacy. In the rural soundscape sounds are generally

uncrowded, surrounded by pools of stillness. For the farmer, the pioneer or the woodsman the minutest sounds have significance. The shepherd, for instance, can determine from sheep bells the precise state of his flock.

Just before dawn he was assisted in waking by the abnormal reverberation of familiar music. . . . In the solemn calm of the awakening morn that note was heard by Gabriel beating with unusual violence and rapidity. This exceptional ringing may be caused in two ways—by the rapid feeding of the sheep bearing the bell, as when the flock breaks into new pasture, which gives it an intermittent rapidity, or by the sheep starting off in a run, when the sound has a regular palpitation.³

The sounds of the environment signalled in many ways.

He was disturbed in his meditation by a grating noise from the coach-house. It was the vane on the roof turning round, and this change in the wind was the signal for a disastrous rain.⁴

Even when sounds had no special messages, poets among men knew how to make larger interpretations of them. Goethe, his ear pressed to the grass:

When I hear the humming of the little world among the stalks, and am near the countless indescribable forms of the worms and insects, then I feel the presence of the Almighty, Who created us in His own image. . . .⁵

When Phillip Grove travelled the Manitoba prairies in his buggy in 1916, often by night or in dense marsh fog, he travelled by ear as much as eye.

I had become all ear. Even though my buggy was silent and though the road was coated with a thin film of soft clay-mud, I could distinctly hear from the muffled thud of the horses' hoofs on the ground that they were running over a grade. . . . I listened intently for the horses' thump. Yes, there was that hoof-beat again—I was on the last grade that led to the angling road across the corner of the marsh. . . .⁶

The Hi-Fi and the Lo-Fi Soundscape

A hi-fi system is one possessing a favourable signal to noise ratio. The hi-fi soundscape is one in which discrete sounds can be heard clearly because of the low ambient noise level. The country is generally more hi-fi than the city; night more than day; ancient times more than modern. In a hi-fi soundscape even the slightest disturbance can communicate interesting or vital information. The human ear is alert, like that of an animal.

. . . footfalls followed a round drive in the rear of the hotel, taking their tone in turn from the dust road, the crushed-stone walk, the cement steps and then reversing the process in going away.⁷

In a lo-fi soundscape individual acoustic signals are obscured in an overdense population of sounds. The pellucid sound—a footstep in the snow, a train whistle

in the distance or a church bell across the valley—is masked by broad-band noise. Perspective is lost. On a downtown street corner there is no distance; there is only presence. Everything is close-miked. There is cross-talk on all the channels, and in order for the most ordinary sounds to be heard they have to be monstrously amplified. In the ultimate lo-fi soundscape the signal to noise ratio is 1 to 1 and it is no longer possible to know what, if anything, is to be listened to.

Muscle Sounds [. . .]: The Industrial Revolution

The industrial revolution began to produce the lo-fi soundscape. Let us briefly chronicle its development. When industry first intruded into town life it was immediately conspicuous by the aberration of its novel noises. Stendhal, writing in 1830, noticed how it upset the rhythms of French provincial towns.

No sooner has one entered the town than one is startled by the din of a noisy machine of terrifying aspect. A score of weighty hammers, falling with a clang which makes the pavement tremble, are raised aloft by a wheel which the water of the torrent sets in motion. Each of these hammers turns out, daily, I cannot say how many thousands of nails. A bevy of fresh, pretty girls subject to the blows of these enormous hammers, the little scraps of iron which are rapidly transformed into nails.⁸

By the early twentieth century such sounds had become more acceptable to the urban ear, "blending" with the natural rhythms of antiquity. As Thomas Mann described it,

We are encompassed with a roaring like that of the sea; for we live almost directly on the swift-flowing river that foams over shallow ledges at no great distance from the popular avenue . . . Upstream, in the direction of the city, construction troops are building a pontoon bridge. Shouts of command and the thump of heavy boots on the planks sound across the river; also, from the further bank, the noise of industrial activity, for there is a locomotive foundry a little way downstream. Its premises have been lately enlarged to meet increased demands, and light streams all night long from its lofty windows. Beautiful glittering new engines roll to and fro on trial runs; a steam whistle emits wailing head-tones from time to time; muffled thunderings of unspecified origin shatter the air, smoke pours out of the many chimneys to be caught up by the wind and borne away over the wooded country beyond the river, for it seldom or never blows over to our side. Thus in our half-suburban, half-rural seclusion the voice of nature mingles with that of man, and over all lies the bright-eyed freshness of the new day.⁹

Ultimately the throb of the machine began to intoxicate man everywhere with its incessant vibrations.

As they worked in the fields, from beyond the now familiar embankment came the rhythmic run of the winding engines, startling at first, but afterwards a narcotic to the brain.¹⁰

Before long, the noises of modern industrial life swung the balance against those of nature. This significant flashpoint occurred about the time of the First World War, the first mechanized war of history. In 1913 the futurist Luigi Russolo proclaimed the event in his manifesto *The Art of Noises* [. . .]"¹

Russolo invented an orchestra of noise makers, consisting of buzzers, howlers and other gadgets calculated to advance his philosophy. The "pastorale" and the "nocturne" give way before machine-music like Honegger's *Pacific 231* (1924), an imitation of a locomotive, Antheil's *Ballet mécanique* (1926), which employed a number of airplane propellers, Prokofiev's *Pas d'acier* (Dance of Steel), Mossov's *Iron Foundry* and Carlos Chávez's *HP* (Horse-power) all dating from 1928. This blurring of the edges between music and environmental sounds is the most striking feature of twentieth-century music. Finally in the practices of *musique concrète* it became possible to insert any sound from the environment into a composition via tape; while in electronic music the hard-edge sound of the tone generator may be indistinguishable from the police siren or the electric tooth-brush [. . .]

Schizophonia

The Greek prefix *schizo* means split, separated. Schizophonia refers to the split between an original sound and its electroacoustical transmission or reproduction. It is another twentieth-century development.

Originally all sounds were originals. They occurred at one time and in one place only. Sounds were then indissolubly tied to the mechanisms which produced them. The human voice travelled only as far as one could shout. Every sound was uncounterfeitable, unique. Sounds bore resemblances to one another, such as the phonemes which go to make up the repetition of a word, but they were not identical. Tests have shown that it is physically impossible for nature's most rational and calculating being to reproduce a single phoneme in his own name twice in exactly the same manner.

Since the invention of electroacoustical equipment for the transmission and storage of sound, any sound, no matter how tiny, can be blown up and shot around the world, or packaged on tape or record for the generations of the future. We have split the sound from the maker of the sound. Sounds have been torn from their natural sockets and given an amplified and independent existence. Vocal sound, for instance, is no longer tied to a hole in the head but is free to issue from anywhere in the landscape. In the same instant it may issue from millions of holes in millions of public and private places around the world.

The twentieth century has given us the ability to dislocate sounds in time as well as in space. A record collection may contain items from widely diverse cultures and historical periods in what would seem, to a person from any century but our own, an unnatural and surrealistic juxtaposition.

Most recently, the quadraphonic sound system has made possible a 360 degree soundscape of moving and stationary sound events which allows any sound environment to be simulated in time and space. This provides for the complete portability of acoustic space. Any sonic environment can now become any other sonic environment. When I originally coined schizophonia in *The New Soundscape* I said it was intended to be a nervous word. Related to schizophrenia, I intended it to convey the same sense of aberration and drama. The benefits of

electroacoustic transmission and reproduction of sound are well-enough celebrated, but they should not obscure the fact that at precisely the time hi-fi was being engineered, the world soundscape was slipping into a lo-fi condition. Indeed the overkill of hi-fi gadgetry contributes generously to the lo-fi problem.

A character in one of Borges' stories dreads mirrors because they multiply men. The same might be said of radios. As the cry broadcasts distress, the loudspeaker communicates anxiety. "We should not have conquered Germany without . . . the loudspeaker," wrote Hitler in 1938.¹² In the USA, Americans were listening to 268,000,000 radios by 1969. Modern life has been ventriloquized.

Towards the Integrity of Inner Space

The desire to dislocate sounds in time and space has been evident for some time in the history of Western music, so that the recent technological developments are merely the consequences of aspirations that have been building for some centuries. The introduction of dynamics, echo effects, the splitting of resources, the separation of soloist from the ensemble, are all attempts to create virtual spaces which are larger or different from natural room acoustics; just as the simultaneous breaking forward to find new musical resources and the turning back to recover the past represents a desire to transcend the present.

If I speak of music it is because I believe music to be a barometer giving clues to our whole attitude towards making and hearing sound. Certainly in the growth of the orchestra we have a clue to the present day imperialistic spread of sounds of all kinds. And there is little difference between Beethoven's attempts to *épater le bourgeois* with sforzando effects and that of the modern teen-ager with his motorcycle. The one is an embryo of the other.

The concert hall made concentrated listening possible, just as the art gallery encouraged, focused and selected viewing. Music designed for outdoor performance—such as most folk music—does not demand great attention to detail, but brings into play what we might call "peripheral hearing," similar to the way the eye drifts over an interesting landscape. Today the transistor is reviving interest in the outdoor concert while headphone listening is isolating the listener in a private acoustic space.

Messages on earphones are always private property. "Head space" is a popular expression with the young, referring to the geography of the mind, which can be reached by no telescope. Drugs and music are the means of invoking entry. In the headspace of earphone listening, the sounds not only circulate around the listener, they literally seem to emanate from points in the cranium itself, as if the archetypes of the unconscious were in conversation. There is a clear resemblance here to the functioning of Nada Yoga in which interiorized sound (vibration) removes the individual from this world and elevates him towards higher spheres of existence. When the yogi recites his mantra he *feels* the sound surge through his body. His nose rattles. He vibrates with its dark, narcotic powers. Similarly when sound is conducted directly through the skull of the headphone listener, he is no longer regarding events on the acoustic horizon; no longer is he surrounded by a sphere of moving elements. He is the sphere. He is universe. While most twentieth-century developments in sound production tend to fragment the listening experience,

rience and break up concentration, headphone listening directs the listener towards a new integrity with himself [...]

Acoustic Design [...] : Quiet Groves and Times

The huge noises of our civilization are the result of imperialistic ambitions. Territorial expansion has always been one of our aims. Just as we refuse to leave a space of our environment uncultivated, unmastered, so too we have refused to leave an acoustic space quiet and unpunctured by sound. The moon probes are undoubtedly a great achievement, but they may likewise be interpreted as an expression of that same imperialism that made Western man a world colonial power.

The amplifier was also invented by an imperialist; for it responds to the instinct to dominate others with one's own sound. But in a crowded and restless world, imperialism loops back on itself; its proponents become its victims as the locus of the battlefield shifts. For the first time in history, Constantin Doxiadis reminds us, man is less safe in the heart of his city than outside the city gates.

Just as man requires time for sleep to refresh and renew his life energies, so too he requires quiet periods for mental and spiritual recomposure. At one time stillness was a precious article in an unwritten code of human rights. Man held reservoirs of stillness in his life to facilitate this restoration of the spiritual metabolism. Even in the hearts of cities there were the dark, still vaults of churches and libraries, or the privacy of drawing-room and bedroom. Outside the throb of cities the countryside was accessible with its lulling whirl of natural sounds. There were still times too. The holy days were quiet before they became holidays. In Christendom Sunday was the quietest day before it became Fun-day. The importance of these quiet groves far transcended the particular purposes to which they were put. We see this now that they are being destroyed. The city park is situated next to the parkway, the library is next to a construction or demolition site, the church is next to a heliport.

Acoustic design will want to pay special attention to the repatriation of quiet groves and times. Genclik Park in Ankara is merely one of many in the cities of the world today that has been wired throughout for background music, though the volume at which it is played is louder than most. This practice betrays an important principle of acoustic design: always to let nature sing for itself.

A park or a garden is a place where nature is cultivated. It is a humanized treatment of landscape. It may contain human artifacts (a bench, a swing) but they must harmonize with the natural inheritance (trees, water)—otherwise we no longer have a park but a highway or a slum. If synthetic sounds are introduced, if we venture to produce what I would call "the soniferous garden," care must be taken to ensure that they are sympathetic vibrations of the garden's original notes. The wind chimes of the Japanese, or the once-popular aeolian or wind harp, are reinforcements of natural sounds in the same way as the trellis reinforces the presence of the rose. The object in creating a soniferous garden would be to work up from natural sounds, materials, formations [...]

The Recovery of Positive Silence

In October 1969 the General Assembly of the International Music Council of UNESCO passed a most interesting resolution.

We denounce unanimously the intolerable infringement of individual freedom and of the right of everyone to silence, because of the abusive use, in private and public places, of recorded or broadcast music. We ask the Executive Committee of the International Music Council to initiate a study from all angles—medical, scientific and juridical—without overlooking its artistic and educational aspects, and with a view to proposing to UNESCO, and to the proper authorities everywhere, measures calculated to put an end to this abuse.

For the first time in history an organization involved primarily in the *production* of sounds suddenly turned its attention to their *reduction*. In the present article I have been suggesting that a saturation point has been reached with regard to all sounds. It remains to discuss how best to accomplish their reduction. I have suggested that the least effective way would be by the introduction of more noise abatement bylaws, sound-proof walls or ear plugs. An uncomprehending public with a developed appetite for noise would scarcely accept these means, unless they were necessary for public health—though in many instances this can now be demonstrated to be the case.

My approach [...] has been to treat the world soundscape as a huge macro-cosmic composition which deserves to be listened to as attentively as a Mozart symphony.¹³ Only when we have truly learned how to listen can we make effective judgements about the world soundscape. I am especially anxious that musicians should take the initiative in this field, because musicians are the architects of sounds; they are concerned with making balances and arrangements of interesting sounds to produce desired aesthetic effects.

Silence is the most potentialized feature of Western music. Because it is being lost, the composer today is more concerned with silence; he composes with it. Anton Webern moved composition to the brink of silence. The ecstasy of his music is enhanced by his sublime use of rests. By this means he produces hi-fi works in which diminutive but stunning musical gestures inhabit containers of stillness.

Simultaneous with Webern's rediscovery of the value of silence in music, his compatriot Freud discovered its value for psychoanalysis. "The analyst is not afraid of silence. As Saussure remarked, the unconscious monologue of the patient on the one side and the almost absolute silence of the psychiatrist on the other was never made a methodological principle before Freud."¹⁴

In the West, silence has for many centuries been unfashionable. It will be recalled that when Galileo's telescope first suggested the infinity of space, the philosopher Pascal was deeply afraid of the prospect of an infinite and eternal silence. "*Le silence éternel de ces espaces infinis m'effraye* [The eternal silence of these infinite spaces frightens me]."¹⁵

When silence is conceived as the rejection of the human personality, the ultimate silence is death. Then man likes to surround himself with sounds in order to nourish his fantasy of perpetual life. In Western society silence is negative, an embarrassment, a vacuum. Silence for Western man equals communication hang-up. If one does not speak, the other will speak. This has not always been so, nor is it so for all peoples today. I have seen Arabs sitting quietly in a circle saying

nothing for long stretches of time. Even the conversation of farmers is much more leisurely than that of citydwellers.

In the West we may assume that silence as a condition of life and a workable concept disappeared sometime towards the end of the thirteenth century, with the death of Meister Eckhart, Ruysbroeck, Angela de Foligno and the anonymous English author of *The Cloud of Unknowing*. This is the era of the last great Christian mystics and contemplation as a habit and skill began to disappear about that time.

I am about to suggest that the soundscape will not again become ecological and harmonious until silence is recovered as a positive and felicitous state in itself. We need to regain that state in order that fewer sounds could intrude on it with pristine brilliance. The Indian mystic Kirpal Singh expresses this eloquently:

The essence of sound is felt in both motion and silence, it passes from existent to nonexistent. When there is no sound, it is said that there is no hearing, but that does not mean that hearing has lost its preparedness. Indeed, when there is no sound, hearing is most alert, and when there is sound the hearing nature is least developed.¹⁶

It is this same idea that Rilke expresses in his *Duineser Elegien* when he speaks of "*die unterbrochene Nachricht der Stille*" ["the endless report that grows out of silence"]. Silence is indeed news for those possessing clairaudience.

Among our students we have declared days of moratorium on speech. In our classes we have also been trying to employ some yogic or relaxing exercises as a preparation to the listening and creating experience. Little by little the muscles and the mind relax and the whole body becomes an ear. This may take some time but at the conclusion, students have told me, they have heard music as never before.

It is in exercises such as these that I have come to believe our ultimate hope lies in improving the acoustic design of the world. Still the noise in the mind: that is the first task—then everything else will follow in time.

NOTES

1. R. Murray Schafer, *The New Soundscape*, Universal Edition, London and Vienna, 1971, p. 1.
2. J. Fenimore Cooper, *The Pathfinder*, New York, 1961, pp. 113–114.
3. Thomas Hardy, *Far from the Madding Crowd*, London, 1902, p. 43.
4. *ibid*, p. 254.
5. Johann Wolfgang von Goethe, *Die Leiden des jungen Werther*, Leipzig, 1774, p. 9.
6. F. Phillip Grove, *Over Prairie Trails*, Toronto, 1922, p. 34.
7. F. Scott Fitzgerald, *Tender is the Night*, New York, 1962, p. 40.
8. Stendhal, *The Red and the Black*, New York, 1926, p. 10.
9. Thomas Mann, "A Man and His Dog," *Stories of Three Decades*, New York, 1936, pp. 440–441.
10. D. H. Lawrence, *The Rainbow*, New York, 1915, p. 7.
11. [See chap. 2, above. —Eds.]
12. Adolf Hitler, "Ohne Kraftwagen, ohne Flugzeug und ohne Lautsprecher hätten wir Deutschland nicht erobert," *Manual of the German Radio*, 1938–39.