LISTENING

by R. Murray Schafer

Editor's Note: *The following is a chapter from the author's forthcoming book* The Tuning of the World, *an extensive study of the soundscape theme. In introducing the theme of acoustic or soundscape design, Prof. Schafer argues that the only valid place for such study to begin is with the ability of the individual to listen. The author is a well-known Canadian composer, director of the World Soundscape Project, and former Professor of Communication Studies at Simon Fraser University.*

Interspersed in the article are "earwitness accounts", written descriptions of the sounds of British Columbia collected by the World Soundscape Project.

The most important revolution in aesthetic education in the twentieth century was that accomplished by the *Bauhaus,* that celebrated German school of the twenties. Many famous painters taught at the *Bauhaus,* but the students did not become famous painters. The purpose was different. By bringing together the fine arts and the industrial crafts, Gropius, Klee, Moholy-Nagy and the others *invented* the whole new subject of industrial design.

An equivalent revolution is now called for among the various fields of sonic studies. This revolution will consist of a unification of those disciplines concerned with the science of sound and those concerned with the art of sound. The result will be the development of the interdisciplines acoustic ecology and acoustic design.

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In wintertime, the stillness, the absence of life or sound, is weird and oppressive. When the snow is on the ground, you may perceive indeed the footprints of animals, of birds, of deer, or occasionally of a bear, but you hear no sound, not a cry, not a whisper, not a rustle of a leaf. Sit down upon a fallen tree, and the silence becomes oppressive, almost painful. It is a relief even to hear at last the sough of the fall of the snow from the boughs of the cypress, the pine, or the yew, which stretch like dark horse-plumes high overhead.

George Green, *History of Burnaby and Vicinity,* Vancouver, 1947, p. 41. Time: 1859-60.

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Ecology is the study of the relationship between living organisms and their environment. Acoustic ecology is therefore the study of sounds in relationship to life and society. This cannot be accomplished by remaining in the laboratory. It can only be accomplished by considering on location the effects of the acoustic environment on the creatures living in it.

The best way to comprehend what I mean by acoustic design is to regard the soundscape of the world as a huge musical composition, unfolding around us ceaselessly. We are simultaneously its audience, its performers and its composers. Which sounds do we want to preserve, encourage, multiply? When we know this, the boring or destructive sounds will become 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 soundscape. Acoustic design is not merely a matter for acoustic engineers. It is a task requiring the energies of many people: professionals, amateurs, young people – anyone with good ears; for the universal concert is always in progress, and seats in the auditorium are free.

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There's a torn and splintered ridge across the stumps I call the "screamers." These are the unsawn last bits, the cry of the tree's heart, wrenching and tearing apart just before she gives that sway and the dreadful groan of falling, that dreadful pause while her executioners step back with their saws and axes resting and watch. It's a horrible sight to see a tree felled, even now, though the stumps are grey and rotting. As you pass among them you see their screamers sticking up out of their own tombstones, as it were. They are their own tombstones and their own mourners.

Emily Carr, *Hundreds and Thousands,* pp. 132–133.

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Acoustic design should never become design control from above. It is rather a matter of the retrieval of a *significant aural culture,* and that is a task for everyone. Nevertheless, in provoking this design-concern, certain figures have important roles to play. In particular composers, who have too long remained aloof from society, must now return to give assistance to human navigation. Composers are architects of sounds. They have had the most experience devising effects to bring about specific listener-responses; and the best of them are masters at modulating the flow of these effects to provide complex and variable experiences which some philosophers have described as a metaphor for the life-experience itself.

But composers are not yet ready to assume the leadership role in reorchestrating the world environment. Some are still devoting themselves with waspish bitterness to a Parnassus of two or three. Others, sensing the importance of the larger theme of environmental reconstruction, are fumbling ineptly with it, betrayed by inexperience or hedonism.

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A quarter of a mile further on is... the Hastings Saw Mill Company, with its incessant rattle of machinery and clouds of escaping steam... Steaming on we pass... the town of Moodyville, where again the buzz of saws, the hum of innumerable drums and pulleys and the noise of shifting lumber as it sweeps down the inclines through the ports of the different ships, greets our ears.

Account of boat trip in 1882, *Williams' B.C. Directory,* 1888.

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The true acoustic designer must thoroughly understand the environment he is tackling; he must have training in acoustics, psychology, sociology, music, and a great deal more besides, as the occasion demands. There are no schools where such training is possible, but their creation cannot long be delayed, for as the soundscape slumps into a lo-fi state, the wired background music promoters are already commandeering acoustic design as a *belazza* business.

THE MODULES FOR ACOUSTIC DESIGN

A module is a basic unit to be used as a guide for measuring. In the human environment it is the human being who forms the basic module. When architects organize spaces for human habitation, they use the human anatomy as their guide. The doorframe accommodates the human frame, the stair the human foot, the ceiling the human stretch. To demonstrate the binding relationship between architectural space and the human beings for whom it is created, Le Corbusier made a man with an upstretched arm his modular symbol and imprinted it on all his buildings.

The basic modules for measuring the acoustic environment are the human ear and the human voice. The only way we can comprehend extra-human sounds is in relationship to sensing and producing sounds of our own. To know the world by experience is the first desideratum. Beyond that lie the wonderful exercises of the imagination – the music of the stones, the music of the dead, the Music of the Spheres – but they are only comprehensible by comparison with what we can hear or echo back ourselves.

We know a good deal about the behaviour and tolerances of the ear and the voice. When, as today, environmental sound reaches such proportions that human vocal sounds are masked or overwhelmed, we have produced an inhuman environment. When sounds are forced on the ear which may endanger it physically or debilitate it psychologically, we have produced an inhuman environment.

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There were still lots of horses until well after the First World War – horses pulling delivery wagons. Every grocer had a delivery cart with one horse. They'd never move faster than a walk and on these cobbled streets that were just stones set in, sort of rough, the horses' iron shoes made quite a row. We've got to bear in mind that at that time there wasn't any noise anyway, so one horse going along a block or two could be heard easily.

Joe Simson (1972) reminiscence.

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There are few sounds in nature that interfere with our ability to communicate vocally and almost none that in any way pose a threat to the hearing apparatus. It is interesting to consider, for instance, that while the naked voice can be raised to quite a loud level (say about eighty decibels at a distance of a few feet), it cannot be raised in normal human intercourse to a point where it might endanger the ear (over ninety decibels). In discriminating against low-frequency sounds, the human ear conveniently filters our deep body sounds such as brainwaves and the movement of blood in our veins. Also, the human hearing threshold has been set conveniently just beyond a level which would introduce a continuous recital of air molecules crashing together. The quiet efficiency of all body movements is another stroke of genius. And has anyone speculated on how inconvenient it would be if the ears, instead of being placed on the side of the head, had been placed next to the mouth, where they would have been subjected to close-quarter vocal garrulity and soup-slurping?

God was a first-rate acoustical engineer. We have been more inept in the design of our machines, for noise represents escaped energy. The perfect machine would be a silent machine: all energy used efficiently. The human anatomy, therefore, is the best machine we know and it ought to be our model in terms of engineering perfection.

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In the winter the kitchen was always the warmest room in the house, so we got dressed in there. I remember the sound of the foghorn from Point Atkinson. I remember it because for some reason it used to echo right under the sewing machine. It was a spooky sound but I got to love it.

Mrs. Ralph Hockridge (1973) reminiscence.

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Contrary to these simple lessons in acoustic ecology, we live in a time when human sound is often suppressed while mechanical jabberware is encouraged. While some of our students were measuring the noise of a downtown construction site in Vancouver, they were entertained by some members of the Hari Krishna sect, an Eastern movement dedicated to the worship of God with song in the streets. In 1971 this group was arrested under the noise abatement by-law, were convicted, appealed the conviction and lost the appeal. This by-law expressly excludes all noise made by construction and demolition equipment – though the students discovered that such noise often ran as high as 90 decibels, at precisely the point where the Hari Krishna singers were arrested. True, singing or hawking in the streets is frequently annoying; but when it disappears, so does humanism.

EAR CLEANING

The first task of the acoustic designer is to learn how to listen. Ear Cleaning is the expression we use here. Many exercises can be devised to help cleanse the ears, but the most important at first are those which teach the listener to respect silence. This is especially important in a busy, nervous society. An exercise we often give our students is to declare a moratorium on speech for a full day. Stop making sounds for a while and eavesdrop on those made by others. It is a challenging and even frightening exercise and not everyone can accomplish it; but those who do, speak of it afterwards as a special event in their lives.

On other occasions we prepare for listening experiences with elaborate relaxation or concentration exercises. An hour of study may be given over in preparation for listening to the next.

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One of the real landmarks in Vancouver was an old women who would yell "PROVENNCE!" She sold the Province newspaper under Birk's clock. She had a voice like a foghorn and had a long, frayed, black coat with a man's hat and fingerless gloves.

Mrs. Donald B. Grant, reminiscence of the 1920's.

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Sometimes it is useful to seek out one sound with particular characteristics. For instance, try to find a sound with a rising starting pitch, or one that consists of a series of short non-periodic bursts; try to find one that makes a dull thud followed by a high twitter; or one that combines a buzz and a squeak. Such sounds will not be found in every environment, of course, but the listener will be forced to inspect every sound carefully in the search.

Sometimes it is useful to document only single sounds in the soundscape in order to get a better impression of their frequency and patterns of occurrence. Car horns, motorcycles, airplanes, can be counted by anyone with ears, and it is surprising how discriminating one becomes when isolating one sound from many. Social surveys can also be conducted simultaneously in which citizens are asked to estimate the number of such sounds they imagine occur over a given time period. In repeated exercises of this sort, we have discovered that the imagined traffic is much below the actual volume – often as much as ninety percent. For instance, when we asked West Vancouverites to estimate the number of seaplane flights over their homes in 1969 the average estimate was eight per day compared with an actual count of sixty-five. In 1973 the same experiment was repeated in the same area. This time the average estimate had risen to

sixteen; but the actual count had also risen to one hundred and six.

Exercises like this extend Ear Cleaning to a wider public. To be reminded of a sound is to think about it; to miss it is to listen for it next time.

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Steam whistles – those were sounds you used to hear. I used to sell these whistles. No two sounded the same. A lanyard would go up to the wheelhouse. The skipper'd yank it and hold it. The steam comes out of this little narrow opening all around, blasts into the bell and whips out. It makes a terrific racket.

It's quieter now, but steam whistles weren't a noise that bothered you. They were a nice sound. Pleasant. And it didn't require much effort to get to know the different ones like the CPR Princess of Victoria. The CPR used to run the big boats to the big centres of population. The Union Steamships (there were a lot of them) would whistle for their own dock – a LONG two SHORTS and a LONG: Whooo, woof, woof, whooo – wherever they went. The CPR's whistle was a LONG and a SHORT, and a LONG and a SHORT: Whoooo, woof, whoooo, woof. Each skipper would do it differently. One guy would drag it out, the next guy would whip it out quick. You knew who was in the wheelhouse.

Joe Simson (1972) reminiscence.

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The tape recorder can be a useful adjunct to the ear. Trying to isolate a sound for high-fidelity recording always reminds the ear of details in the soundscape that have previously gone unnoticed. Sound events and soundscapes can be recorded for later analysis and if merited can be permanently stored for the future. It goes without saying that only the best tape recorders should be used for this purpose. When we record sounds we provide them with cards giving the following information:

No. _____ Title: _____

Date recorded: _____ Name of recordist: _____

Equipment used: _____ 7½ i.p.s. mono
15 i.p.s. stereo
other quadraphonic

Place recorded: _____ Distance from source: _____

Atmospheric conditions: _____ Intensity: _____ dBA
_____ dBB
_____ dBC

Historical Observations: _____
_____

Sociological Observations: _____
_____

Additional Observations: _____
_____

Names, ages, occupations and addresses of local people interviewed: _____
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_____

Sounds threatened with extinction should be noted in particular and should be recorded before they disappear. The vanishing sound object should be treated as an important historical artifact, for a carefully recorded archive of disappearing sounds could one day be of great value. We are currently building such an archive. Our list is very extensive, but a few examples will suffice for illustration:

The ringing of old cash registers;
Clothes being washed on a washboard;
Butter being churned;
Razors being stropped;
Kerosene lamps;
The squeak of leather saddle bags;
Hand coffee grinders;
Rattling milk cans on horse-drawn vehicles;
Heavy doors being clanked shut and bolted;
School hand-bells;
Wooden rocking chairs on wooden floors;
The quiet explosion of old cameras;
Hand operated water pumps.

We train students in soundscape recording by giving them specific sounds to record: a factory whistle, a town clock, a frog, a swallow. It is not easy if the result is to be "clean", without distracting interferences. How often has the novice recordist, sent out to record a "complete" passage of an aircraft, switched off the machine before the sound has dropped totally below the ambience? Even the life of the more experienced recordist is often hazardous. On one occasion, for example, a small boy had watched our recording team setting up their sound level equipment and tape recorders to measure and record a particular noon whistle. Just as it began, the boy, who had been carelessly left next to a microphone, said: "Is that the whistle you want mister?"

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The conductor at the back of the streetcar had a hand bell to signal the motorman at the front. A single bell meant to stop at the next street corner, two bells signalled the start, three bells meant to back up and, I believe, four bells signalled an emergency stop.

The interurban cars had a very distinctive whistle sound, produced by an airwhistle. For some reason they had two different codes. When they were in town they used – just like the streetcars – one signal for stopping at the next street. But once they were outside of town they used three whistles as a stop signal.

On New Year's Eve when the late tram went out to New Westminster you could hear it blow the horn all the way out there.

Gordon Odlum (1973) reminiscence pre-1955.

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A TOURIST IN THE SOUNDSCAPE

The student of acoustic design should keep a soundscape diary, constantly noting interesting variations in sounds from place to place and time to time. The ear is always much more alert while travelling in unfamiliar environments, as proved by the richer travelogue literature of numerous writers whose normal content is acoustically less distinguished. This at least seems to be true of such authors as Thoreau, Heinrich Heine and Robert Louis Stevenson. Returning from a trip to Rio de Janeiro (1969) an American student

was able to produce a much more vivid account of the Argentinian soundscape than of the city in which he lived.

RIO DE JANEIRO	NEW YORK
Street hawkers	Traffic
Bargaining in the market place	Horns of taxis
Live chickens and birds in the markets	Bums on streets in the Village
Man going around swatting flies in restaurants	Buses
Ice being chipped from blocks (no crushed ice)	Subway trains
Cars and wagons on cobblestones	Foreign languages on streets and in restaurants
Street cleaners sweeping by hand	Occasional drunks on streets at night
Strange dial tone, busy signal and ringing of telephones	Police sirens
Predominance of old cars from 40s and 50s	
Singing and dancing in the streets; music echoing through the whole city from amplifiers (Carnival)	
Old hand-operated elevators	
Steam engines in the country	
Total silence in the classroom when teacher enters	
No electrical machines in businesses and banks	
250,000 people shouting together in a stadium	
Cockatoos	
Monkeys	
Cutting of Jacaranda	

When one travels, new sounds snap at the consciousness and are thereby lifted to the status of figures. But the acoustic designer must be trained to perceive all aspects of *any* soundscape unmistakably, otherwise how should he be able to adjudicate it properly? How should he be able to gauge the effect of signals and soundmarks and know the function of keynotes and background sounds?

It is not enough to remain a tourist in the soundscape, but it is a useful stage in the training program. It enables a person to become detached from the functioning environment in order to perceive it as an object of curiosity and aesthetic enjoyment. Like tourism itself, this type of perception is a recent development in the evolution of human civilization. As the American geographer, David Lowenthal, has written: "Perception of *scenery* is only open to those who have no real part to play in the landscape."

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Bowen Island used to be a popular Saturday night resort then. We used to go on so-called "Moonlight Excursions" on the "Old Lady Alex" [Lady Alexandra]. An orchestra would play on the boat over to the island. They'd get off there and go up to the dance hall, where they played till half past eleven. When the boat left late at night the trumpeters would go up on the bridge and play "Farewell To Thee". This sound, wafting across the water as the boat backed out into the darkness, was something fantastic.

Ralph Hockridge (1973) reminiscence of the late 1920's and early 1930's.

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Because of his dependence on visual stimuli, modern man has allowed himself to be led by the tourist industry into believing that tourism consists simply of sight-seeing. But the sensitive human being knows that environment is not merely what is seen or possessed. A good tourist inspects the whole environment critically and aesthetically. He never merely "sight-sees"; he hears, smells, tastes and touches. A tourist of the soundscape would demand not *Sehenswürdigkeiten* but *Hörenswürdigkeiten.* With increased leisure all men could become tourists of the soundscape, remembering affectionately the entertainment of soundscapes visited. All it would take is a little travel money and sharp ears.

SOUNDWALKS

A listening walk and a soundwalk are not quite the same thing, or at least it is useful to preserve a fine shade of distinction between them. A listening walk is simply a walk with a concentration on listening. This should be at a leisurely pace, and if it is undertaken by a group, a good rule is to spread out the participants so that each is just out of earshot of the footsteps of the person in front. By listening constantly for the footsteps of the person ahead, the ears are kept alert; but at the same time a privacy for reflection is afforded. Sounds heard and missed can be discussed afterwards.

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You don't realize what you have until you no longer have it. Noise is so all-pervasive now that the tendency is not to listen. In the past the trains either whistled more or we heard them better. In any case they seemed to be announcing their arrivals, starting from a long distance away, and we heard the steam whistles, then all that snorting and puffing. They had more personality.

Mrs. Donald B. Grant, reminiscence of the 1920's.

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The soundwalk is an exploration of the soundscape of a given area using a score as a guide. The score consists of a map, drawing the listener's attention to unusual sounds (keynotes, signals, soundmarks) to be heard along the walk. A soundwalk might also contain ear training exercises. One could have a dialogue with a slat fence by dragging a stick across it; or the pitches of different telephones or cash registers could be compared. Different walking surfaces (wood, gravel, grass, concrete) could also be explored. "If I can hear my footsteps as I walk, I know I am in an ecological environment," said a student. In one soundwalk a student asked participants to enter a store and to tap the tops of all tinned goods, thus turning the grocery store into a Caribbean steel band.

A series of ingenious soundwalks ought to be of interest to the tourist industry, and it would be of great value also in introducing Ear Cleaning into schools. The relationship of soundwalks to contemporary *environmental* music is also clear. Exercises such as these are the root of the acoustic design program. Yet they require no expensive equipment and they do not camouflage simple acoustic facts with pictures or statistical displays which, being silent, are *not acoustic information*.

When a school of acoustic design worthy of the title finally comes into existence, Ear Cleaning must be its Basic Course.