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# CANADA

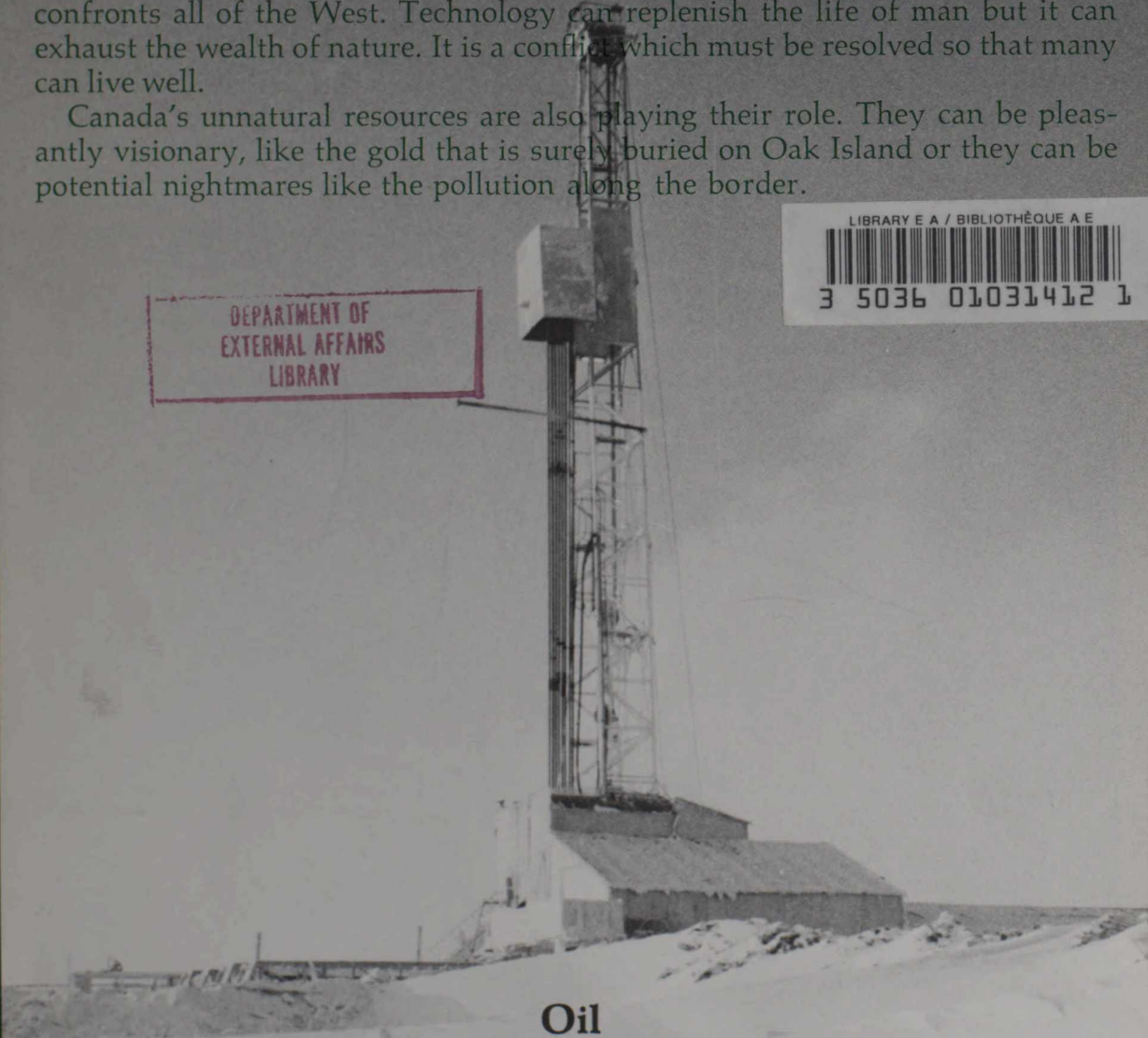
TODAY / D'AUJOURD'HUI

Canada's Natural and Unnatural Resources shape its future. The greatest natural one is people. Its most discussed are oil and the other things that have been accumulating under its surface for millions of years. The people and the oil and the other riches are all tied up together. Canada is at once both a developed and an underdeveloped nation. Its cities are resplendent with new buildings, its homes with new color TVs, its laboratories with new electronic marvels and its banks with computers. But most of Canada is still primeval — virgin forests, pure icy lakes. The challenge for Canadians is the challenge that confronts all of the West. Technology can replenish the life of man but it can exhaust the wealth of nature. It is a conflict which must be resolved so that many can live well.

Canada's unnatural resources are also playing their role. They can be pleasantly visionary, like the gold that is surely buried on Oak Island or they can be potential nightmares like the pollution along the border.

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## Oil

On February 24, 1972, thirty-five men working in the Arctic night on Ellesmere Island, 650 miles from the north pole, sent word by radio that they had struck oil after drilling to a depth of 3,425 feet.

Ellesmere, Canada's northernmost bit of land, is closer to the pole than any land except the tip

of Greenland. Because the permanent polar ice begins not far off its coast, the Island was the jumping-off place of early polar explorers. The fact that Canadians have been drilling for oil there illustrates points both about Canada and its oil: It is a country potentially rich in resources, but sometimes it has to go to great lengths to

get at them. Canada is now drilling for oil and natural gas all across its Arctic frontiers and in waters offshore.

Canada's oil production was minor until 1947 when the wheat and cattle province of Alberta struck it rich. Alberta became Canada's Texas. Canada advanced from being the world's fifteenth ranking oil producer to ninth place today. In 1946 it produced only nine per cent of the oil it consumed. Now on balance it could be self-sufficient.

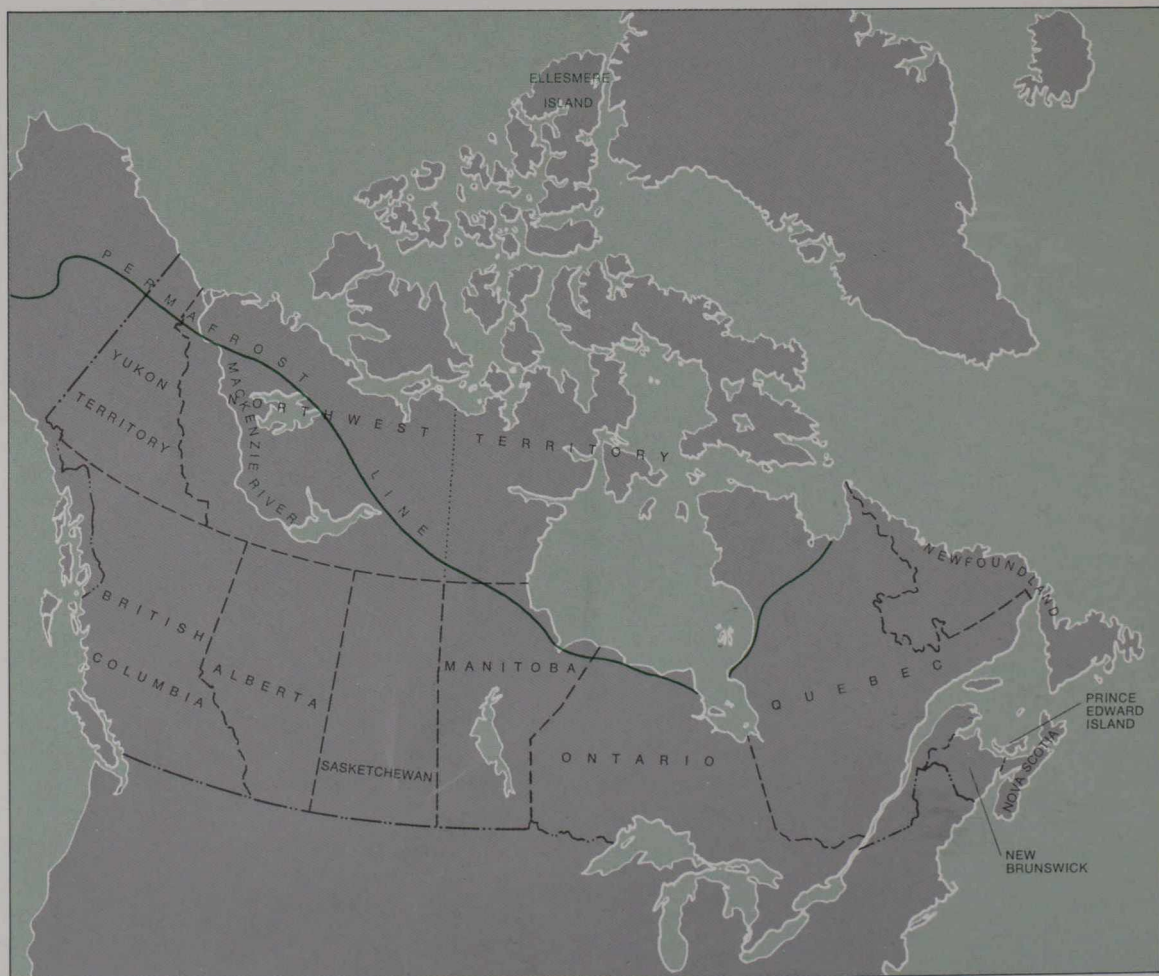
Its *known* oil reserves, mainly in Alberta with smaller amounts in British Columbia, Saskatchewan, and Manitoba, now amount to about ten billion barrels, enough for about seventeen years at the current annual rate of use. But in recent years it has become evident to Canada's planners that these established reserves will not be enough. The country's use of energy is expected to quadruple by the year 2000. Its exports of oil to the United States are growing. Jack Austin, Deputy Minister of Energy, Mines and Resources in Ottawa, estimates that by the end of the century, Canada will need additional reserves of both oil and natural gas approximately equal to all its proven reserves to date just to keep up with domestic demand, not counting increases in exports.

Geologists estimate that Canada has a poten-

tial 120 billion barrels of oil, twelve times existing known reserves, plus vast supplies of natural gas, in its Arctic regions and off-shore. There is probably another 300 billion barrels of viscous oil in the Athabasca tar sands in Alberta if efforts which are being made to extract it turn out to be economical.

Canada is not just the ribbon along the border, it is a rough pentagon shape as deep from north to south as it is wide from east to west. Its northland is an immense undeveloped area. The Yukon and Northwest Territories begin at the 60th parallel and comprise forty per cent of its land, yet here only 60,000 people live, mainly Indians and Eskimos. Beyond the 60th, Canada stretches 1,500 miles north toward the pole. Many of the promising oil and gas areas are along the farther side of this northland.

To date, there have been significant gas finds in the Mackenzie Delta and the Arctic Islands — and some oil. Getting this gas and oil to market poses huge problems. Though the tanker *Manhattan* made it across a frozen Northwest Passage in 1969, year-round operation of tankers in most of the Arctic is not yet practical. On land the Arctic permafrost — ground permanently frozen down as far as 1,500 feet — sounds solid. But



sometimes it has an extremely high water content. When bulldozers strip away the insulating ground cover and the summer sun shines, it becomes soup. Pipelines can sink into it; hillsides slide into valleys. A Canadian consortium has plans to build a gas pipeline from the Mackenzie River Delta in the Northwest Territories to Canadian and U.S. markets. A 900-mile highway along the Mackenzie River is under construction and is expected to open up, for the first time, a vast section of the northland. The Mackenzie pipeline project has a U.S. counterpart, the proposed Trans-Alaska Pipeline by which oil from Prudhoe Bay on the North Slope of Alaska would be piped southward across that state to Valdez on the southern Alaska coast, where it would be transferred in tankers. At one point Canada invited the U.S. to discuss the prospect of shifting the TAP to a Canadian route. However, the U.S. Interior Department said Alaskan oil was needed sooner than the oil pipeline could be constructed across Canada. The Alaska route has been much criticized on environmental grounds, the Canadian route less so, but in both cases an Arctic oil pipeline raises big environmental problems. Gas can be piped cold, but oil must be pumped hot, and ways must be found to insulate it from the permafrost in some areas. The Arctic tundra recovers slowly from damage. Other potential environmental upsets include fouling of sea birds by oil on beaches (where there is related tanker transport), deflection of the migration of caribou by pipelines, damage to critical ranges of moose, spoiling spawning areas of fish and indiscriminate hunting as a result of opening access to wilderness areas. Arctic pipelines also raise the prospect of disruption of traditional native ways of life.

It has been estimated that developing new oil and gas sources in Canada may require \$50 billion in new capital during the next ten years. Because investment capital is limited, some of this is expected to be U.S. money, and this is a subject of

much debate in Canada. The Canadian Government's most recent statistics show that through 1967 a group of industries — manufacturing, petroleum and natural gas, mining, smelting, railways, other utilities, merchandising and construction — together were twenty-eight per cent controlled by U.S. direct investment capital. The petroleum and natural gas category had the highest foreign control — sixty per cent U.S. and fourteen per cent other foreign. This is a subject of concern for many Canadians. The Canadian Government has been looking for ways to increase Canadian financial participation in industry. It put up initial funds to start a Canada Development Corporation, with voting shares limited to Canadians, which it is hoped will provide a vehicle for increased Canadian equity participation in growing Canadian industries.

Canada has decided, as a matter of national policy, to develop oil and gas resources primarily for its own use, allowing exports when reserves are surplus to Canadian needs. However, geography has imposed some economic constraints on the marketing of Canadian oil in eastern Canada where easy access to middle eastern and Latin American crude oil make those sources much cheaper than western Canadian oil. Hence, Canada, since 1961, has had a National Oil Policy under which all of Canada east of Ottawa is supplied by imports, mainly from Venezuela, and all the rest of Canada is supplied by Canadian oil. In 1971 Canada imported 666,000 barrels of crude per day and exported 750,000 barrels per day. Virtually all of the latter went to the United States, a natural market since it uses high-priced oil. (Canada is the only industrialized country in the west which has a supportable surplus of oil.) Finally, the intense exploration activity in the highly promising Arctic islands and east coast offshore areas offer the prospect of freeing Canada from dependence on offshore oil supplies some time during the next several years.

## Dirty Air

The International Joint Commission has pinpointed the causes of bad air along the border.

It reports that the bad smells noticeable in Michigan come from Canada and those in Canada come from Michigan.

More specifically, in the Windsor, Ontario, area roughly ninety per cent of particulates and ninety-four per cent of sulphur oxides originated in the United States. The principal sources were the steam electric power plant and metallurgical industries in Wayne County, Michigan.

In the Sarnia-Port Huron, Michigan, area about

fifty-two per cent of the particulates and twenty-seven per cent of the sulphur oxides originated in Canada. The principal sources in the St. Clair River area were the steam electric power plants in Michigan and the oil refineries and chemical industries near Sarnia.

The Commission is urging the governments on both sides of the border to adopt soon its air quality standards and then to "enter into an agreement on schedules for the implementation at the earliest practicable date of preventive and remedial measures."

For 177 years the treasure of Oak Island, Nova Scotia, has inspired greed and adventure, killed men and ruined fortunes.

The treasure is now in sight — it has been photographed — but it is not yet in hand. Fortunes are at last likely to be made, though not necessarily by those who did the digging.

The island is a small one in a place where islands are many — there are by myth 365 in Mahone Bay, one for every day in the year.

In 1795 there were more islands than men. The men were fishermen and boys were boys. Daniel McInnes, sixteen, rowed out the hundred yards from shore to hunt birds. There, on top of a hill, he found a twelve-foot wide saucer-like depression directly under the sawed-off limb of an oak. There may or may not have been a ship's block and tackle hanging from the limb.

The hanging block is the first element of the mystery. If it existed it established a paramount point — blocks are made of wood, tackle is rope, and wood and rope rot. If a block did hang from the limb it must have been used to lower treasure into the ground. And if it was there in 1795 the treasure must have been buried not too long before, years perhaps, but not decades.

The block is still at the heart of the mystery. But whether or not Daniel found it, he did see the depression and he dug. He dug ten feet down and came to a spruce platform. He rowed home and got two other boys to help, Tony Vaughan and Jack Smith. They dug and discovered a design. A shaft had been expertly made, then carefully filled. There was a platform every ten feet. The boys needed help. They tried in vain to find it — the island was supposed to be haunted. Two fishermen had vanished there in 1720 when they'd rowed over to investigate strange lights.

Two of the boys, McInnes and Smith, settled on Oak Island. In 1804 a local rich man, Simeon Lynds backed them in a new effort and with the best of modern machinery they dug down to ninety feet. They found, as expected, a spruce platform every ten feet and they also found a mass of coconut fiber, some charcoal and ship's putty. They found a stone, chiseled with mysterious signs. A cryptologist, whose qualifications are lost in the years, read them to say that gold to the value of two million pounds was buried ten feet below. The diggers probed with a crowbar and at ninety-eight feet they hit something solid. They were exultant but tired. They went to bed.

The next morning they went back to the shaft and found it almost full of water. They tried bailing to no avail. The water remained, sixty feet deep.

The next spring Lynds hired miners and they sunk a 110-foot shaft beside the first one. Then they started to dig over, to get under the treasure and come up from below. The wall broke and the new shaft flooded, miners scrambling to keep ahead of



*The best place to dig for gold is in a gold mine, and the best thing to do with gold is to give it to someone for Christmas. Some men, who may not have been wise, put their gold back in the ground for safekeeping.*

## Oak Island

Once upon a time some very clever men dug one of the world's most complicated holes in an island shaped like an exploding pork chop off the pine swept coast of Nova Scotia. They stuffed it with gold. Maybe. Now Dan Blankenship, (top, left) and his cohorts are about to get it out. Maybe.



the rush. Lynds gave up and Daniel McInnes the original discoverer died.

There was a long pause. Treasure hunters get discouraged but they never quit.

In 1849 Tony Vaughan, a man well into his sixties now, tried again. This time he had the backing of a wealthy man named Vaughan Smith, possibly a relative, possibly not. There were a lot of Vaughans and a lot of Smiths around Nova Scotia. A syndicate was formed, the latest equipment purchased, including a horse-driven auger, and optimism was reborn.

The hole was still full of water, but the auger could push right through. Its purpose was to bring up samples of what lay below, which it did with almost mathematical precision. Below the ninety-foot plank flooring was an open space, then four inches of oak, then twenty-two inches of metal, eight more of oak, another twenty-two of metal, four of oak and six of spruce. After that clay. The metal included golds, specifically three links of a gold chain, and a scrap of parchment. The diggers were jubilant.

In 1850 they sunk another shaft, 110 feet deep, by the original two. Once more they tried to dig over to the treasure. Once more the water rushed in. This time they noticed something that had been missed before. The water in the shaft rose and fell

with the tides and it was salty. Tony Vaughan remembered that a half century before he had noticed after the first hole was flooded that water bubbled up in Smith's Cove as the tides went out. Smith's Cove was 520 feet from the diggings. The men went to the Cove and dug again. They found a man-made rock floor under the sand, 142 feet long, covered with coconut fiber and drained by five tunnels. They found neatly crafted tools, a wooden scoop and notched logs with chisled Roman numerals.

The men who had buried the treasure had protected it with extraordinary ingenuity. The drains were the mouths of a tunnel. The tunnel ran first on a slight slope, then on a precipitous one, 520 feet to the wall of the treasure chamber. When the chamber and the chambers above it were full of clay the water had been held back. When the pressure was removed the water had crumbled the wall and flooded the shaft.

The tunnel was dynamited off. New shafts were sunk. They flooded too. There was, it became apparent, more than one tunnel.

Decades went by with many men trying to get the treasure out of the ground and none succeeding. The latest diggers, a consortium of Canadian and American businessmen, joined as Triton Alliance

Ltd., have been at it for six years. They have at their command the technology of the late 20th Century and have spent \$500,000. The shafts are still flooded, but no matter — men can now dive deep under water and work.

Triton now has a new shaft, 185 feet from the original "Money Pit." It is not a true shaft but a hole eighteen inches in diameter, large enough for a camera. At the bottom the driller found a vault, apparently one connected to the original shaft by a lateral tunnel. A T.V. camera was lowered into the vault last year and it disclosed shapes which were interpreted to be human remains, three chests, bits of wood and a pickaxe. The Montreal Star reported that later still photos showed clearly two skeletons and three chests, one with an inscription.

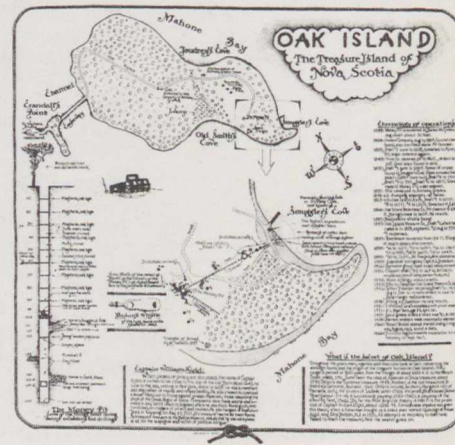
Plans now are to drill two more twenty-eight-inch holes into the vault through which water could be pumped. The pumps would not attempt to dry out the vault permanently but merely to keep it clear enough so that divers could unload the treasure trunks and send the valuables up on a hoist. The problems ahead are still great. At the depth of the vault a diver could work for only a few minutes.

Still it may be that at long last the hands of man are about to grasp the buried treasure. If they do they may well also solve the basic mystery — who buried it.

The theories are many — it has been suggested that the government of Spain had the formidable underground complex dug and that it contains the legendary Inca treasure which disappeared from the city of Tumbrez in the 16th Century. There is something to be said for that. It is impossible to believe that a pirate or a band of pirates had the time, patience, man power, authority and engineering skill to build the tunnels and vaults. And in the 16th Century there would have been few curious fishermen around to spy on the operations. Any that were could have been left in the vaults.

The solving of the mystery may be the only immediate gain. Triton has already spent a half a million and the vault in question is clearly not the main one. No one knows what is inside these trunks. But if it is brought up it will be valuable. Ralph Surette suggested last spring in The Montreal Star that the real value of the treasure would be as an attraction to tourists. He quoted one Nova Scotia realtor as saying "In five years Oak Island will be the biggest tourist attraction in eastern North America." The south shore of Nova Scotia is becoming a rendezvous for tourists and a summer playground for the rich and super-rich. The rich are building \$50,000 houses on large estates. The super-rich are buying whole islands.

The beauty of Nova Scotia has become more valuable than the gold.



## R. Murray Schafer



"Neshmoor," "Sloofulp," "Maunklinde," "Sheelesk," and "Malooma" are Canadian seventh-graders' solutions to the following assignment: "Create a more suggestive word in a private language for 'moonlight'."

"Plimniblemay," "Cudabulut," and "Drimpollillins" are examples of *raindrops* contributed by university students.

The perpetrator of these forays is R. Murray Schafer, now Resident in Music at Simon Fraser University in Burnaby, British Columbia. The private and original words which students generate for themselves do several important musical things. They provide material for musical setting. They exercise the student's creative abilities. They set him thinking about the basic stuff of music and sound.

Another example of Schafer's ability to stimulate students is his "Biography of the Alphabet," a compendium of Schafer's own attitudes and reactions to the letters of the alphabet:

- "A" (pronounced *ah*) The most frequent vowel-sound in English. Elemental. *Ur*-sound. If the mouth is wide open, you can't produce any other sound. Together with "m" as "ma" it is the first word spoken by millions of infants.
- "G" Guttural, brash in a solar-plectic sort of way.
- "J" Sound of metal striking cement. Jaded, jingle. When sustained, "jjjjjjjjj," it suggests a motor needing oil.
- "SH" White noise. Full frequency-spectrum of random sound.
- "T" On a typewriter, all letters sound like "t" — tttttttt.

These and many other unorthodox approaches to musical education and to the education of music educators characterize Murray Schafer as a seminal mind in his field. Besides being an artist as a teacher, he has written books for adults to read and pieces of music for youth choirs and youth orchestras to perform.

The first of Schafer's four books on musical education was *The Composer in the Classroom*, basically a set of transcripts of class sessions in which Schafer and his students are recorded in

verbal form. In a first chapter the students express their musical preferences and distastes. A tone of acceptance of their opinions is set from the beginning. Next Schafer explores "What is Music?" and, slowly stimulating their ears and minds, builds his class up to a point of musical creativity on their own.

A second book, called *Ear Cleaning*, is a set of notes written directly to and for those music educators who wish to attack the problem of making a course on new music. The book is subtitled, "Notes for an Experimental Music Course." The chapters are concerned with "Noise," "Silence," "Tone," "Timbre," "Amplitude," "Melody," "Texture," "Rhythm," and culminate with "The Musical Soundscape." This book gives an orderly format for creating a course which encompasses new music.

A third book, called *The New Soundscape*, is diverse in its format and polemic in its tone. It calls attention to the dangers of noise pollution with pointed eloquence, and, more importantly and almost uniquely, is full of examples of how to fight the noise pollution and thoughtless brutalities of The New Soundscape:

"Keep a world sound diary. Wherever you go take note of what you hear." From this admonition to students and teachers alike, Schafer progresses to this one:

DEAR STUDENTS:

IT IS TIME TO GET ACQUAINTED WITH A NEW SUBJECT: FORENSIC ACOUSTICS, THE STUDY OF THE GROWING NUMBER OF NOISE-NUISANCE AND EAR-DAMAGE CASES TAKEN TO COURT.

He goes on to advise his students to join or form a noise-abatement society.

Schafer's most recent book returns to words. It is called *When Words Sing*, and is a rich source of creative thinking and sound reasoning on the subject of words and spoken sounds in life and in music.

As in his earlier books, Schafer sets the tone of the lesson and of the text with his assignments: "Take your own name. Repeat it over and over until it gradually loses its identity. Lull the sense of it to sleep. Hypnotize it until it no longer belongs to you. Now that it is merely a quaint sound object hanging in front of you, examine it thoroughly with your ears."

The book builds up to a discussion of Schafer's piece for Youth Chorus and Optional Bells en-

titled *Epitaph for Moonlight*, a setting of the seventh-graders' made-up words for 'moonlight.' Schafer explains in the preface that "Moonlight is a study-piece for youth choir. It is an ear-training exercise, for the singers must learn to pitch their notes by interval from any note given." Schafer's musical score itself carries on the process of education and mind-opening, training now practicing young musicians, rather than music teachers of regular schoolchildren or young adults. As the chorus begins each one of its episodes, one singer is allowed to choose a tone on which to begin. Thereafter, throughout the episode, the other singers must cue on this original note and sing another note a particular musical distance away.

Schafer's first piece for youth performers, *Statement in Blue* for youth orchestra, is even more free in giving performers choices. Here, pitch and duration are free throughout the composition. This means that within set limits, each player can choose which note to play at all times, and even how long to play it.

At one point in the score, a solo is proscribed as follows: A box is drawn, clearly setting off a certain space in the score for one event. Within the box, a wavy line begins at the lower left and moves upward as it progresses naturally toward the right. Midway its course, it turns downward, and then becomes wavy at the end, just as at the beginning. This solo is suggested for flute or oboe. The player is given two verbal instructions: "A bird climbs slowly into the sky." at the beginning of the wavy line's adventure to the far left; and then "Then glides to earth again." at the ending on the right.

Schafer's attitude toward musical performance and toward the relationship between composer and performers in his youth pieces can be seen from a very interesting comment with which he closes out his set of instructions to *Statement in Blue*:

"Anything in this score may be omitted or changed if, in the opinion of the performers it leads to an improvement."

Murray Schafer's most recent piece for youth is by far his most ambitious. It is called *Threnody* and it involves youth choir and youth orchestra as well as magnetic tape and five narrators — children ranging in age from eight to seventeen years old.

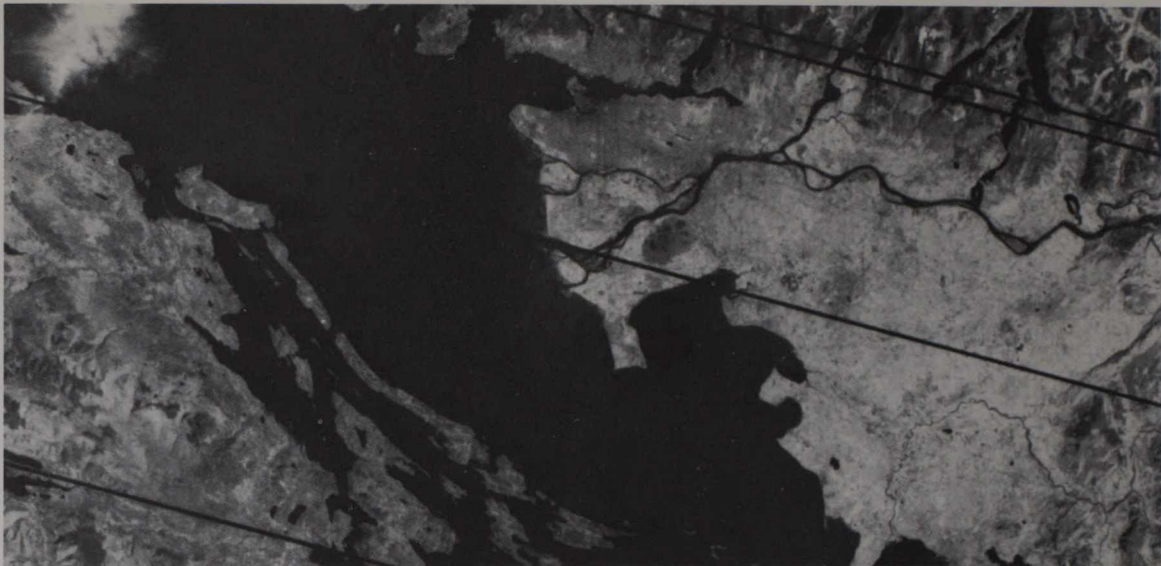
*Threnody* is an evocation of the horrors of nuclear destruction. The narrators intone eyewitness accounts of the atomic bombing of Nagasaki and comments and telegrams sent to and from the Potsdam Conference reacting to the first atomic bomb blast. It is a rare opportunity for young musicians. The musical score itself is complex and varied in the degree to which it gives performers options. Also, in the field of new classical music, the coherence of form and rightness of the many parts of the whole of a piece of music are often the weakest aspects of a musical composition. Experiencing a masterful work which succeeds in tying together diversities cannot help being a valuable experience.

Murray Schafer has contributed a great deal to the musical life of countries where English is read. Now in progress is the translation of his books into German for publication in Europe.

This article is by Stephen Wheelton, a composer, artist and music reviewer.

STATEMENT  
IN BLUE  
FOR YOUTH ORCHESTRA  
R. MURRAY SCHAFER

1. The music is to be played in a relaxed, unhurried manner. The tempo is to be determined by the conductor. The music is to be played in a relaxed, unhurried manner. The tempo is to be determined by the conductor. The music is to be played in a relaxed, unhurried manner. The tempo is to be determined by the conductor.



Canada as a natural resource is best seen from the Earth Resources Technology Satellite (ERTS). This view was taken last July. The water line, right center, which looks like a profile of Punch, touches Vancouver. A more conventional Vancouver profile is below. Last month Canada sent the world's first domestic communications satellite — Anik I — to join other Canadian hardware in the sky, including Alouette I, the longest operating satellite, which has been collecting data for ten years.



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