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Resources for Living

THIS IS A PRODIGAL CENTURY, probably the most prodigal in the history of the world. We are using up the earth's resources at a pace never before known. The surface is being scratched to provide food for a rapidly increasing population, and modern industry is literally turning the earth inside out at a rate that never occurred in the past except in the neighbourhood of volcanoes.

All this is creating a new environment, an environment which we are not yet sure will be healthful and habitable for us and our successors.

Human life is not a simple thing, like stepping from not being into being. Before our environment could start to support the likes of us it had to be built up from the simplest microscopic cells through higher and still higher forms. The process is still going on, as our environment changes by small degrees between ice age and ice age.

Since mankind toddled its first steps there have been great changes in the demands made by men upon the earth's produce. But in the same time there has been no significant change in the earth's 24,902 mile circumference, its 145 million square miles of ocean, its 58 million square miles of land surface. Our allowance of land suitable for cultivation is some 10,710 million acres, about 3½ acres for each person living today.

It is obvious that since we live within such limited bounds, every change we make in our environment, from the building of cities to the explosion of nuclear forces, has profound biological significance for us. If we alter things around us, we must adjust ourselves to new conditions of existence. Darwin's theory of survival of the fittest does not mean survival of the best, but only survival of those best fitted to cope with their circumstances.

Evolution is not only a belief about how we came to be what we are, but our hope for becoming what we need to be.

Here is the human problem in a sentence: to what extent shall we conform to patterns imposed by environment and how far shall we go in resisting and changing them? Every force we set in motion, whether by our technology or by our treatment of soil, animals,

birds, insects and bacteria, will affect the lives of many other creatures.

This problem must be faced with one tremendous factor in mind: the increasing pressure of world population. Always, so far back as history carries us, there has been this pressure of the biological increase of human beings on the sources and means of production. Some of the pressure was relieved in past centuries by expansion into new continents; some was relieved by the development of new food production processes.

There are no new continents today, and world population has increased from 900 million at the time of the American Revolution to 3,060 million in 1960.

These mouths are being fed from soil which we are working intensively. Only recently have we begun to think of the need to maintain the proper mineral content in this soil. Only recently have we become active in trying to stem the washing away of chemical elements necessary to proper nutrition.

While life has been evolving for perhaps 500 million years, this change in demand has come about in the last two hundred years, and our awareness of the need for conservation can be dated no further back than a half century. It would be strange if some adjustments in our thinking and our behaviour did not have to be made.

What is our environment?

Professor A. F. Coventry, in an address to the Toronto Field Naturalists' Club, referred to "this compulsive matrix . . . which provides the marvellously fit environment for life, but only if life conforms to that environment."

As it is used in terms of human life, "environment" is a comprehensive word. It is the community in which we live; the neighbouring counties and the distant plains and mountains, and the actions of men whose influence spreads out to affect in some way nearly every community living on the earth. Our destiny is governed by a multitude of events taking place beyond the observational range of any individual.

Basically, nature is an orderly system of things and events. A healthy and excellent way of life demands balance between soil and city; plants, animals and men; air, water and industry. Men are but a part of the pattern in which the soil-plowing worm, the mineral-exploiting industry, the chlorophyll-using plant and the lowly spider's web all have their place. Men, having so great power to interfere with the ways of nature, have a corresponding duty to study it so as to make their interference constructive.

Some of the laws contributing to the balance of nature are these: adaptation, succession, multiplication, and control. When these laws are obeyed, nature tends to produce on any piece of land the greatest amount of life that it can support. There is a built in system of checks and balances tending to maintain a stable condition or to lead to a gradual change: for example, a climax forest or a pond that is being converted successively into a marsh, a bog, and a swamp.

We have paid too little attention to these facts. As Professor Coventry said: "We have assumed that we can push nature about to our heart's content without reference to that subtle interplay of living things that we call the balance of nature, when in fact we interfere at our great peril."

The greatest man of letters produced by ancient Rome said two thousand years ago something that might with truth have appeared in today's newspaper: "Nature points out her tendencies by a variety of unambiguous notices, and proclaims her meaning in the most emphatical language, yet I know not how it is, we seem strangely blind to her clearest signals, and deaf to her loudest voice!"

Of this we can be sure: no retaliation of nature is caused by a perverse desire to frustrate us, and no explosion of nature is an incoherent episode. We are expected to know the laws which govern us, and upon our conformance to them depends the future of the human race.

Most of us want, as one of the principal things in life, our health, but if we make the earth sick we ourselves shall reap the diseases arising from pollution, exhaustion of the soil, wasting water. It is not enough to work out medical schemes involving hospitals, doctors and drugs, although in our present state we need them greatly. It is not enough to invent new ways of "making" food — as did the British scientists who this year discovered a process of making milk without a cow. We need, first of all, to make sure that the bases of our lives — soil and water and air — are pure, and that they contain the elements necessary to our bodily systems.

Our food sources

So long as the balance of nature remains undisturbed, the soil is a self-renewable fund. This implies that arable land is as much a function of the farmer as of the farm.

There are people who would, because they have a cage and no pool, try to turn a tadpole into a squirrel instead of a frog, just as there are farmers who, under the pressure of the market, try to grow grain on land fitted only for trees. We cannot force land into the pattern we wish to impose upon it, but must fit the use to the land, its capabilities, and its limitations. The quality of the soil, its organic and chemical content, has a great effect on the quality of the plants that grow in it, and therefore on their food value.

This is why the steering committee of the 1961 "Resources for Tomorrow" Conference decided on formation of a Resource Ministers Council for Canada. It will meet several times a year to consider policies and plans for more effective resource management and development.

Basic knowledge about plants has advanced at a prodigious rate, but wisdom in their management has been slow to come.

What the plants do has been known for a long time. The green leaf pigment, called chlorophyll, is the one link between the sun and life: the conduit of energy to our bodies. In the plant's green laboratory the chlorophyll blends the sun's rays with elements taken from the air, the water and the soil. When the plant is eaten by an animal, the stored-up force is used to sustain life. When a plant dies, its roots and leaves sustain the small organisms which are among the most important factors in the cycle of life, the bacteria. These decompose the remains of higher plants and animals into new chemical combinations to be used as food by new generations of plants.

Our agricultural plants, our grains and our roots, have been forced out of their natural habitat where they could look after themselves in their own way into a new environment, largely artificial. We owe them the debt of protection and culture.

Our forests

In every land and in all ages the forests have had profound influence on the progress and welfare of mankind. The story of man's advance from a primitive cave-dweller to the master of a civilized world cannot be told without frequent reference to his contacts and relationships with forests.

The violation of the laws governing the extent of forest cover is one of the most tragic examples of human folly in the face of nature's wisely ordered system. As continuous waves of immigrants swept over one country after another, the forest was pushed back by axe and fire. The hoe and the plough were used where only trees could grow. As a Nicaraguan proverb has it: "One man in one day with one match can clear a hundred acres!"

Productive forests are possible only by the sustained and effective practice of good forestry. This involves progressive cutting, reseeding either by planting or encouraging seed trees, protection against insects which bore into the trees, and grazing animals which destroy the bark and the ground cover.

Wildlife

It goes without saying that wildlife needs a place in which to live, and it should follow that human beings must preserve or provide that place.

As was said in a "Resources for Tomorrow" background paper: "Regardless of any peregrinations of the gross national product, Canada will be irreparably poorer if, as a result of economic pressures, we lose a single species of our native wildlife."

When a forest is cut, a field plowed, or a marsh drained, wildlife is affected. This is not to say that we must not cut, plow or drain, but only that these operations should be modified by, or accompanied by, the actions needed to provide for the displaced wild creatures.

In the past, all forms of life were subject to automatic natural controls, but man, stepping in with his artificial controls, threatens to undermine the whole pyramid of nature's system. We cannot continue to build an urban environment according to the dictates of economics, technology and convenience, while ignoring the natural laws of biochemistry.

The illusion has persisted as part of our folklore that natural wealth is inexhaustible.

Our national and provincial coats of arms feature the beaver, sheaves of wheat, maple leaves, trees and buffalo. But, as was said by Professor Ian McTaggart-Cowan in *Wildlife Review*: "The symbol of our generation is the bulldozer."

We need to take care lest we overreach ourselves in our attempts to impose our will on nature. On a museum wall is a sign which reads: "The animal you see here is the most dangerous and destructive creature on earth." Below these words hangs a mirror.

This comment has not universal application. There are many people and organizations working to bring back perspective to the resources picture. They do not wish to retard progress; they do not wish to rob people of their pleasure. They do believe that the principles of life on a planet inhabited by more than a million and a half species of plants and animals, continually using and reusing the same molecules of soil and air, should not be tampered with by un-informed tinkering.

Pollution

The purity of our air and water and the foods produced on our soil and in the sea will determine our number, our health, our efficiency, and our enjoyment of life.

Although pollution has reached impressive proportions, legislation competent to eliminate it is creeping forward at a snail's pace. There is delay in initiating measures of cleanliness because of lack of clearly defined responsibilities. The various levels of government are not certain who should do what. As was said in a paper presented at the "Resources for Tomorrow" Conference: "Indecision and delay stem

in part from differences in interpretation of the B.N.A. Act and a lack of clear federal and provincial policies." Meantime, public health is at stake, recreational values are impaired, industrial uses are limited, and fisheries suffer.

Our rivers are flowing to the sea, as they always did, but with this difference: on their journey every drop of water gives its service again and again to the homes and towns and cities along their banks. Every user — individual, industrial, municipal — takes water from the river, uses it, defiles it, then returns it with its load of refuse to the river for the next user to get from it what service he can. Insecticides are carried from surface and ground water into streams and lakes, where they kill large numbers of aquatic animals. The use of bodies of water as dumping grounds for nuclear wastes leads to concentration of radio-active matter in plankton, algae, mollusks and fish, which in turn make their way into human diet.

Because of modern water treatment methods, such as filtration and the addition of such chemicals as chlorine, water-borne epidemics are infrequent, though it is possible that epidemics of non-fatal character are unrecognized as being water-borne.

Offers by the federal and provincial governments to share the cost of erecting efficient sewage disposal plants often come to a dead end at the municipal level because apathy of the public combines with the tax rate to discourage sponsorship by municipal governments.

Pest controls

Agriculture today may be differentiated from that of an earlier day by its reliance upon chemical preparations in the control of insect infestations. In the present state of nature, with many natural checks and balances removed, it is necessary that this should be so.

A statement by the Canadian Agricultural Chemicals Association in August said that since 1947, when the annual sales of pest control products in Canada amounted to \$7 million, the volume of sales has more than quadrupled. "Twenty years ago", continues the statement, "25% of all crops were destroyed by insects. Today, progressive use of chemical aids has cut farmers' crop losses by one half on a much larger agricultural output."

But it does not do to ignore ecological processes while being guided by such quantitative criteria as the size of the crops. At the annual conference of agricultural ministers and their deputies from the ten provinces, held in Quebec in July, Dr. J. R. Bell, of the Manitoba Department of Agriculture, recommended that more applied science is required to decide the effectiveness and safety to people and animals of insecticides now used in Canada.

It is remarked in *The Bulletin* of the Conservation Council of Ontario: "We know almost nothing of even the direct effects of many control agents on

plants, animals, soils and soil organisms, and we know still less of the indirect, accumulative and long-time effects these controls have upon wildlife, plants, and even upon man."

What of the future?

What about subsequent centuries? This question is a fair one, and we should not be permitted to dodge it. The earth we abuse will, in the end, take its revenge; for in exploiting it today we are diminishing the future of our children.

Few voices are raised nowadays in favour of the complete "return to nature" which gave Henry David Thoreau notoriety when he set up housekeeping beside Walden Pond in the middle of the nineteenth century. He wrote: "I put no manure whatever on this land, not being the owner, but merely a squatter."

Modern man can never return to the primitive life he so often professes to idealize. He does not need to. The use of machinery and chemicals do not conflict with good farm practice, nor do industry and city life preclude the benefits of more natural environment.

But such a life, making the best of two worlds, needs to be planned.

Instead of concentrating upon technological research of a short-time character to achieve functional ends, we need answers to these questions: Has constant displacement by civilization made the grasses, grains and trees more vulnerable to disease? What is the long-range effect of pesticide and insecticide spraying? Will the succession of selective cutting of one-tree species, which is a standard forest management practice, affect the heredity of the species? These questions were posed in an article in the Ontario conservation *Bulletin* two years ago.

Conservation

The meaning of conservation, say ecologists firmly, is not preserving everything but working to keep things in balance. The physical requirements of society must be met from the resources of the natural world, but met in a way which, while fulfilling the needs of the present, will assure the maintenance of reserve for the future. Making the world a better place in which human beings may live involves making the world a better place for all living organisms.

"Personal conscience," said one writer, "is the beginning of conservation." This application of personal conscience should not await the onslaught of a gigantic crisis in the resource supply. It should begin in childhood and grow with maturity and understanding, until conservation becomes a way of life.

There is, in Canada, a small dedicated band of resource specialists, and another band of non-specialist nature lovers. Upon these people falls the task of informing the public, so that large numbers of people will understand the urgency of the issues.

The beauty of life

All this is very important, even vital, to our physical lives, but there is more.

"Life," says a fine Greek adage, "is the gift of nature; but beautiful living is the gift of wisdom." One way to prevent life from becoming an empty dream is by becoming a vital part of all life.

Men of the nineteenth century took up a posture of aggressiveness toward the forests, prairies and seas. These were obstacles to be overcome, impediments to progress. Today we are filled with a vague nostalgia for the very things they destroyed. To a certain degree, wrote L.H. Herber in *Our Synthetic Environment*, this reflects the insecurity and uncertainty of our times. But it also reflects a deep sense of loss, a longing for the free, unblemished land that lay before the eyes of the frontiersman. It springs from the growing need to restore the normal, balanced, and manageable rhythms of human life.

Not all of us can study ecology intensively, but we can all walk under trees older than our nation's history, on a forest floor rich with the things that sustain life, or fish along a conifer-shaded stream or bird-watch along the edge of bushland. A natural area is a living library, where we can see, hear and taste life in action, and feel ourselves a part of all creation.

This is the sort of thing the Federation of Ontario Naturalists has in mind in sponsoring "The Bruce Trail", a continuous footpath from the Niagara Peninsula to the tip of the Bruce Peninsula at Tobermory. Along the way would be cool glens, sparkling waterfalls, intriguing rock formations, rich fossil remains of an ancient polar sea, and varied plant and animal life. At the northern end of the trail is "the great North American rendezvous of plants" — native orchids, rare ferns, the blue and gold dwarf iris, scarlet-painted cup, many of them not found elsewhere.

The will to live

Some speakers and writers on conservation are asking whether man will develop understanding before he destroys himself by destroying his environment. It is possible to misjudge the will or instinct to live. Our will to live may be merely somnolent, awaiting something to urge it into action.

Meantime, we may learn. Man's life is like a boat in a storm, says Plato. The storm may overwhelm the skilful seaman, but it is always better to know how to steer. Socrates says man cannot expect success in life without knowledge of rule and standard, when he would never presume to hope for success in his craft under such conditions.

We can admit, like the boatman, that unforeseen things, eruptions from outside into the pattern of our expectation, will invariably turn up. But it will not do, because of this possibility, to omit preparation for what we can foresee.