Environmental Awareness: THE WAY OF SURVIVAL

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MANY people are alarmed by the increasing reports of the dangers of pollution and the declining of life supporting materials. They are eager to seek further information that will give them a direction for action and help to clarify the total picture of endangered human survival. These concerned people are requesting the schools to give leadership for a better understanding of the total situation and for possible solutions.

The elementary classroom teacher is in a critical position in the educational continuum to effect the immediate curriculum revision needed to teach the ecological environmental awareness necessary to indicate the direction for human survival. The University of Virginia School of General Studies is presently engaged in the development of a program for elementary educators throughout the state to satisfy the immediate requests. The following represents some of the major concerns identified by our joint investigation.

Awareness is best defined as the ability to verbalize those ongoing processes within a person's life space. Awareness is a prerequisite to commitment, and commitment is a prerequisite to action. Our problems of population, litter, waste, and pollution need action for solution.

The people as a group and the individual will not move to solutions of these problems until they have been made aware of their actuality. The basic concept of this awareness must be taught at the elementary school level. There are certain concepts that, when presented under the curriculum strand of awareness, will lead to direct understanding and action for the solution of some of the major problems facing the human race today.

Waste Disposal

One of the major problems under discussion by concerned environmental leaders throughout the nation is that of our solid waste residue. This solid waste residue comes in many forms but we think it may do well

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to just look at one of these forms, that of containers. It appears that of all the forms of litter the container produces the largest percentage of our solid waste, estimated at six pounds per person per day. The human society at the present works under a philosophical structure of "no-deposit no-return." We must institute at the elementary school level the philosophy of reusable production. This concept is not a very difficult one to put across.

We would begin with the assumption that our land space should no longer be used for garbage disposal. In the past we filled in swamps, covered up gullies, and put in foundations for towns—a process no longer practical. The logical solution would be to manufacture containers which are easily disposed of or can be reused. If all liquids were dispensed in reusable containers which had approximately a 5¢ value, we doubt if our highways would be littered with the number of bottles and cans that are visible along them in the present situation. And even more important, the great volume of solid waste which threatens to contaminate our soils and water would be significantly reduced.

One of our major concepts, then, is production reuse. Another major concept that must be taught at the elementary level is that of the cause and effect mechanisms in water pollution. This has not been a favored subject at the elementary school level. Educators have not been eager to develop a readiness for understanding liquid waste disposal. It now appears the responsibility of the elementary school teacher to ask questions such as this: "When a toilet is flushed, or a washer is drained at home, where does the waste go?" From the pipes, where does the waste go; from the tanks, where does the waste go? One might say that the waste water goes into the sewers and on to the treatment plant where it is "cleaned up" and returned to the rivers.

What must be understood and taught is that it is these very "clean" waters which are killing our streams, rivers, lakes, and even the estuaries. In other words, modern waste water treatment is only partly effective. The nutrients, or life-sustaining fertilizers such as phosphates and nitrates from detergents and foods, are largely untouched and are released into natural waters. These create water too rich in food which in turn causes the explosive growth of microscopic organisms known as eutrophication. As these organisms die off the oxygen required to decompose the resulting mass of organic matter causes the depletion of this life-giving substance, causing death of fish and other wildlife.

It must be taught that the "solution to pollution is not dilution" but better and more costly methods to remove the unseen pollutants from waters. At this point does it not seem logical that a reuse be developed for this water-borne material which at the present seems to be a deficiency? The nation of Japan for many years has survived on a reusable waste plan. Scientists now indicate that we have the technology which could make this waste into an efficient fertilizer.

Air Pollution

Air pollution has become a major problem—due in part to population density with its associated industrial density and large numbers of motor vehicles. Our vast industrial complexes all involve combustion of fuels. By-products such as sulphur compounds, oxides of nitrogen, and hydrocarbons are released into the air. Secondary reactions triggered by sunlight convert these chemicals into acids such as sulphuric and nitric. Particles are also emitted, leading to dirty laundry at least and possible health hazards when combined with other contaminants. Prevention of these emissions must be the goal, abatement to be employed only where prevention is not technologically possible. People have to recognize that the cost of improvement will be reflected in the price of manufactured or processed goods and in tax expenditures. Many domestic sources such as home heating equipment, backyard barbecues, leaf burning, trash burning are all contributors to air pollution.

The gasoline-burning automobile is, however, responsible for at least one-half of all air contaminants; some 90 million tons annually of unburned hydrocarbons, oxides

of nitrogen, carbon monoxide, and solid particulate emission are produced. Federal laws have been enacted to require manufacturers to design cleaner engines. It is not yet clear whether this will prove technologically possible. The real problem will be, however, the care given to maintenance of these control devices by individual owners. The policeman who observes a smoking exhaust will require complete public support of his writing a citation for the vehicle owner. The complete solution may require a radically different vehicle, less fancy, smaller, and totally lacking in prestige values. The choice may become one of a modern one-horse shay which will produce inter-city transportation, with public rapid transit within the city. The alternative, retention of the present high-styled glass and chrome Detroit monster, may well be "Ride fancy but for God's sake Don't Breathe!" The American public must adopt a completely new attitude with regard to the automobile and what it represents if real progress is to be made.

Until the people are aware of the end point of the ongoing processes around them, they will not be concerned with the devising of solutions for their own ultimate protection.

Stability Rather Than Growth

A critical factor in this effort to sow the seeds of environmental awareness will be what one might call "spaceship philosophy." Too long we have treated our environment as if we were on an ocean-going ship where wastes and problems could be dumped over the side and forgotten. Such an attitude is no longer tenable. The concept we must convey to future generations is that of a spaceship environment wherein all wastes remain with us and must be recycled into something useful. This concept leads us into the imperative of considering stability rather than constant growth as the answer to human survival. It appears that population stability and the possibility of the two-child family as the norm need to be pondered. This forces the recognition of a finite earth with finite resources of fuel, water, air, and minerals and finite ability to produce foodstuffs. The religion of constant growth as the essence of "progress" must be recognized, as Preston Cloud of California recently described it, as having the status of a sacred cow but the destructive potential of the Trojan Horse.

Man is an intelligent animal. He has always lived by the end point of his intellect. The school system has the obligation to further this intellect, but it also has the obligation to orient the child's thinking along lines designed for optimizing the survival of the species.

Elementary school students involved in activities and exposed to objectives that would teach the preceding concepts will be the voters and the citizens who could interact with the environmental and ecological structure and yield positive results. Man has exhibited the fact that he can balance out a dwindling life support system. This is evident, for example, in the statistical fact that Virginia now has more forest land than it had some 100 years ago. Through the allowed reforestation of unused farm land and because of industry's concern with the dwindling of natural resources, the state of Virginia is at present involved in a winning campaign for reforestation. Most other aspects of the battle to save and improve our environment have not been so successful, but at least this is an instance in which man's intellect is intervening to solve a problem that his behavior pattern has caused.

These are but a few of the major problems—the solutions of which will assist the future generations to draw back from the brink of environmental destruction. Although few in number, these basic concepts are the start of ecological awareness.

At present, there are concerned educators developing textbooks, courses, in-service workshops, and lesson plans that will assist the elementary classroom teacher in this life struggle, for life survival, through life-sustaining classroom lessons. Only when the elementary educator has been exposed to and has chosen to teach environmental ecological awareness will we have involved the citizens of tomorrow in the first wave of retaliation in our battle for survival. □