

It is necessary to set objectives before policy for pollution control

Pollution of environments is a major concern in many countries of the world. The non-living portions of the environment and the living community, which comprise the human environment, are currently under severe stress in the more populated portions of the world. The well-being of human life depends directly upon the well-being of the systems from which all life support systems emanate. These are known as ecosystems.

In order that definitions be understood uniformly and the scope and diversity of the problem fully recognized, the following definitions for pollution is proposed:

- a. any activity or process which alters the amount of energy entering an ecosystem.
- b. any activity or process which changes the rate at which chemicals are cycled within an ecosystem.
- c. any action or process which alters the non-living physical environment.
- d. any activity or process which alters inter-community structure at a rate which is significantly different from normal ecological succession and "tension" responses.

When the above definition is accepted, it can be seen that most of the activities of modern man are "polluting" the natural ecosystem. This does not mean, however, that in the quantitative sense certain levels of pollution can be either tolerable or selectively beneficial. For example, the cultivation of good soils in the dark brown and black soil zones of Alberta replace a grassland ecosystem with one of cultivated cereal grains. Although the agricultural community is an artificial ecosystem created by man, this does not mean that it is of less value or that the replacement of one natural ecosystem by an artificial ecosystem is necessarily wrong. The controlling principle is that *the biophysical base which supported the original ecosystem has not been depleted.*

Before any effective pollution control policy can develop, it is necessary for an objective to be set. The objective generally reflects the desires of the human population which would be most affected by the pollution and also those which would be affected by the side-effects of an upset in ecological balances (such as climate, atmospheric composition, and the accumulation of harmful substances in food stuffs). Many of these standards already exist; however they are changeable, based on the research experts who set arbitrary levels

of what is "harmful" and what is not. The setting up of pollution control objectives implies philosophical, sociological, economic, and political inputs from which an objective is derived. Pollution itself takes many forms. Among the most noticeable of these are:

- a. water pollution
- b. air pollution
- c. noise pollution
- d. aesthetic pollution
- e. soil pollution
- f. "mind" pollution

The diversity of polluting sources is so great that no single discipline is able to cope with the problems of pollution control. This is especially true as societies' objectives are not always clear (the existential dilemma).

Philosophically it can be argued that pollution is a natural outcome of human development and that the limiting factors, checks and balances within a biological system have simply been amplified by modern science and technology. In other words, if pollution kills us off, so what! We have only created a set of environmental resistances which we are not able to overcome as a species.

On the other hand, although man and most species are "crises animals", survival of species is dependent upon the application of intelligence and high reproductive power, which minimized the effect of external stress regardless of how it is created. Humans, with their ability to reason and use intellect as well as senses, may evolutionarily develop behavioural patterns for survival based on reason rather than spasm response.

The characteristics of certain animal populations can be compared cautiously to show correlative effects in human populations. Man has characteristics and requirements the same as any other furred, feathered, or finned creature on earth. He reacts to population pressures the same as other animals. Unless man can control his numbers and maintain a satisfactory quality environment, he will crash and decline like any other species. It is not important to specify just how he will decline. Certainly the amount of unrest, as reflected by aggressive behavior, will increase just as in a crowded animal population and our whole society will crumble. This may come in the form of an anti-industrial revolution, mass die-offs from toxic

pollution or internecine warfare. In effect what we are saying is, "Nature bats last".

The fact is that there are currently 3½ billion people on the earth. If the trend continues, by the year 2000 there will be 7 billion people. By the year 2025, there would be 14 billion people. This is slightly more than 50 years away. One disturbing thought which is heard, primarily from agriculturists, is that we must feed the hungry world. This is a totally unrealistic objective unless population control is instituted because energy resources are finite! The earth may be able to support a population of 7 billion if the technology continues to improve, human habit patterns change and the distribution of resources is equalized. The method of distributing resources, however, is an institutional rather than a technological problem. However, we cannot expect technology to perform in future the miracles which it has performed in the past, especially if the institutional framework remains the same. There are only so many units of certain critical resources within the earth's crust and atmosphere. There is an absolute limit to the amount of energy which can be transformed in any given ecosystem. Ultimately, there is a maximum number which an ecosystem can support. Fertilizer application and other technological manipulation provides only a temporary solution; and then, mostly by transporting resources from the area of production and placing them at another location. It is necessary to consider other uses of land besides food production or the use of land for the extraction of nonrenewable resources. Subsequent technology no doubt will assist in the balance process, but there are still only a limited number of resource units. In the non - too - distant future, man will have to face up

to the rate of extraction which took place in former times and suffer its consequences. This applies particularly to the over utilization of zinc, copper, mercury, molybdenum, and petrochemicals. What happens a few generations from now when these critical resources run out and there is a need for them? Who plans for substitution of locally recoverable coal when it becomes physically depleted? Decisions must be reached at even international levels as to the optimum population that the earth can support. There may be a possibility that even 3½ billion people is too much for the earth to support over the long period of time. It would seem that neither economists nor politicians were looking at long range objectives. Economists planned within the projected value of the dollar, while politicians'



planned for the period between elections. Now there is a great opportunity for long term planning on the part of politicians whether local, provincial, or national.

An intentional attempt is made here to avoid moralizing about whether or not man has a right to continue to inhabit the earth. The basic assumption of resource management generally is that a resource is only a resource when it satisfies HUMAN WANTS AND NEEDS.

Historically man has been a creature of habit. However, the passing of time and the accumulation of mans' knowledge have established a framework of reference sufficiently well constructed to support realistically derived concepts of what constitutes a quality environment. Benjamin Disraeli once said that "The practical man can be counted upon to perpetuate the mistakes of his ancestors." The important point is that it is no longer necessary to make decisions concerning the use of resources or the pollution of environments on the basis of habit pattern alone. Biologists have estimated significant genetic change resulting from changes in the environment can become apparent after about ten generations. This should indicate that man has had a time to change from a creature of simple stimulus-response cycles to a state of intellectual development in which reasoning replaces spasmic response as a basis for decision. Inasmuch as the body of mans' knowledge has increased twofold in the past 15 years, there is little excuse for continuation of belief in obsolete concepts based on ancient conventional wisdom.

The earth is being changed by pollution more rapidly than ever before. Pollution, however, is only a byproduct of the population-consumption-energy transformation cycle. Unless conservation and pollution control is practiced intensively there will be insufficient area to provide quality environment. This may even result in the reduction of productive capacity for pure food for this population. When food supplies are the limiting factor, Malthusian checks will come into play; or, at best, the world will drift into a society organized increasingly more tightly in which mans' social freedom is virtually destroyed.

