

MOTHER NATURE UNDISTURBED.

By

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Recent decades have witnessed the rise of a widespread and vibrant enthusiasm for the protection of our natural environment. This general concern for the environment was born out of a concern about the negative effects of large-scale human and economic activities on the natural environment. The desire to live in a clean and healthy world is undoubtedly a good thing. However, we must endeavour to remain clear-headed while pursuing this noble end, so that we don't end up prescribing remedies that are useless, or worse.

In this regard I would like to discuss a notion that is widely suffused throughout the general environmental movement. This is the notion that the ideal state of nature is one that remains completely undisturbed by human activities. In this state, nature is believed to be balanced, self-regulating and idyllic - a virtual Garden of Eden. I am not happy with this notion for two reasons. Firstly, this picture of nature is not true to reality. Secondly, this view pictures humankind as antagonistic to the natural world, a vandal whose activities must be policed and whose instincts are to cause damage.

The history of the natural world is a litany of change. Massive changes have occurred in the natural environment of the earth since the planet was formed. Relative to the length of time biological life has existed on earth, 3.5 billion years, Homo Sapiens has only been around for the merest blink of an eye - 200,000 years. Enormous changes have taken place in the natural environment over the past 3.5 billion years, and all of the major changes occurred before humankind even existed. Some of these changes had a devastating effect on many existing life forms.

The atmosphere of the early earth contained no oxygen. Life therefore began as an anaerobe, that is as an organism capable of living without oxygen. In fact, oxygen is a deadly poison for these anaerobic organisms. After a while, a new form of life developed capable of directly harnessing the energy of the sun to synthesise food, and in the process liberating oxygen to the atmosphere. Oxygen levels gradually built up in the atmosphere and the high ozone (a form of oxygen) layer was formed. The oxygen in the atmosphere killed off most anaerobic forms of life, which were replaced by new forms of life capable of using molecular oxygen. Also, the newly formed ozone layer absorbed much of the incoming deadly ultraviolet light from the sun thereby allowing most of the surface of the earth to carry life.

The entire subsequent history of the natural world is an unbroken litany of change. On the biological side, new species of life arose, developed, and spread into every habitable niche on the earth. Great natural changes occurred from time to time, for example changes in climate. The earth has experienced several ice-ages. Some of the natural changes that occurred had a devastating effect on many biological species. There have been several mass extinctions of biological species.

The earth itself is constantly changing. The earth's outer crust is cracked to form several great plates that move slowly about on the underlying molten layers. Where these great plates collide or slide against each other, mountains are thrown up and earthquake activity and volcanos are generated. Everywhere and at all times the natural world is changing.

The widespread deference to the idea that 'nature-knows-best', even when this is presented in technical-scientific terminology, such as ideas of equilibrium and ecological climax, are often based less on a real knowledge of how the natural world operates than on a hankering after ideas inherited from eighteenth century romantics. The romantics celebrated naturalness in all its forms, e.g. primitive man and untouched nature, as a reaction to what they thought were the over civilising forces in modern society. These ideas gained strength during nineteenth century industrialisation. However, it wasn't until recent decades that ideas developed in this mode of thinking, such as steady-state nature, were put to empirical tests, and in many cases they didn't stand up.

Take for example the concept of maximum sustainable yield, which, in fact, has something of a scientific basis. This is based on an equation that produces the S-shaped growth curve, and describes the growth of a population of organisms under constant conditions, beginning with a small number of organisms and multiplying to an upper limit known as the carrying capacity, set by the conditions. The S-shaped growth curve can be observed if you put a few fruit flies into a bottle, maintain a constant food supply and environment and watch the population increase. The largest population that can be reproduced indefinitely, the maximum sustainable yield, is half the carrying capacity, according to a simple calculation.

The precision of the S-shaped curve had a powerful appeal for people who managed natural resources. But uncritical acceptance of the concept led to many problems. For example the Peruvian anchovy fishery was once the largest in the world. In 1970, this fishery yielded 8 million tons of anchovies as in previous years; 2 years later the catch dropped by 75 per cent. The fishery had been managed throughout this period to produce the maximum sustainable yield. It took many years for this fishery to slowly recover.

The moral is that lessons learned from simple systems in the laboratory often do not translate well to a natural ecological system. Ecosystems are extremely complex, made up of a huge number of interdependent organisms and factors. If one element shifts slightly the whole system can change, e.g., a fishery can collapse. In fact such a system is the embodiment of change. This is true on every level - climate, distribution of species, rate of extinction of species - constancy does not exist in the biosphere.

So, what is the message? Is it that it doesn't much matter what we do as human beings, because nature is changing anyway? Certainly not. Clearly ozone depletion, the enhanced greenhouse effect and acid rain are bad things and we must strive to reverse the conditions that produce them. But in dealing with the environment we must appreciate 3 things. Firstly we are part of nature ourselves and not a form of alien vandal. Seeing ourselves as set apart absolves us of true responsibility. Secondly, although we know a certain amount about how ecosystems work, there is much more we don't know and we should be wary of working to rigid formulae. Thirdly, nature is not a law, like the law of gravity. It is a story, and the story is not over. There is no given original state - a Garden of Eden - against which we can judge our 'fall', or to which we can return.

Perhaps at this stage all we can do, and the best thing we can do, is to think of nature as a garden and humankind as the gardener. We must cultivate our garden cautiously using our experience as well as scientific knowledge to ensure, as best we can, that our garden remains healthy, fruitful and beautiful.

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