# Environment for future?

by Peter Faulkner

One measure of human progress is the range of citizen sensitivity to the rights of others. Beyond oneself, one's neighbors, the scope of concern for rights has been extended to nearly all classes and conditions of people. In 1972, Christopher Stone's *Should Trees Have Standing?* expanded this scope to include objects in the natural environment. Three years later, by demanding a careful study of nuclear power's impact on future generations, today's citizens implied that tomorrow's rights were at risk.

This is progress of a modest sort. One could be more optimistic if these rights were expressed in decreased weapons stockpiles, pollution and resource consumption rates. The record shows otherwise: technical and industrial developments since 1946 have seldom been restrained by a legal system that anticipates, but will not enjoin, damage to human beings a century from now. The courts' reluctance arises partly because a stable, effective body of law requires a pre-existing system of ethics. Enough hazardous substances and devices have been developed since 1946 to justify a new ethic to protect humans, ecosystems and wildlife. But because the nuclear, microwave and chemical industries seem to have arrived simultaneously, more than a brief set of guidelines is needed ...

Posterity rights should have been articulated years ago. But precisely what rights should be protected? How and by whom? To prevent what kinds of wrongs? For what period of time? Finally, once these rights are translated into specific duties, what effect will their discharge have on economic and political systems, on resource consumption rates and on prospects for disarmament and permanent peace? As a first step in exploring these issues, consider three basic rights for posterity.

Unborn generations have the right:
(1) to an intact genetic heritage and to freedom from contamination by carcinogenic and mutagenic processes and substances, released today,
(2) to enjoy both plant and animal wildlife in the same variety and environment existing today, and,
(3) to a proportional share of the earth's resources.

The operative effect of our three propositions is to dilate the scope of rights to include all present living things and then project that circle forward into time to form a cylinder of protection enveloping future entities. Two generic tactics may be useful in reaching this objective: elevating the standard of care and shifting the burden of proof.

Of all the substances and processes manufactured today, it is uncertain which ones are harmless and which are carcinogenic or mutagenic. There are major gaps in our knowledge, the data is far from complete, synergistic effects are unstudied for the most part, and the Toxic Substances Control Act is being implemented while the number of toxic agents and processes continues to multiply. The only sensible solution, and by no means an economic one, is to shift the burden of proof from the victim to the manufacturer of the harmful substance or process.

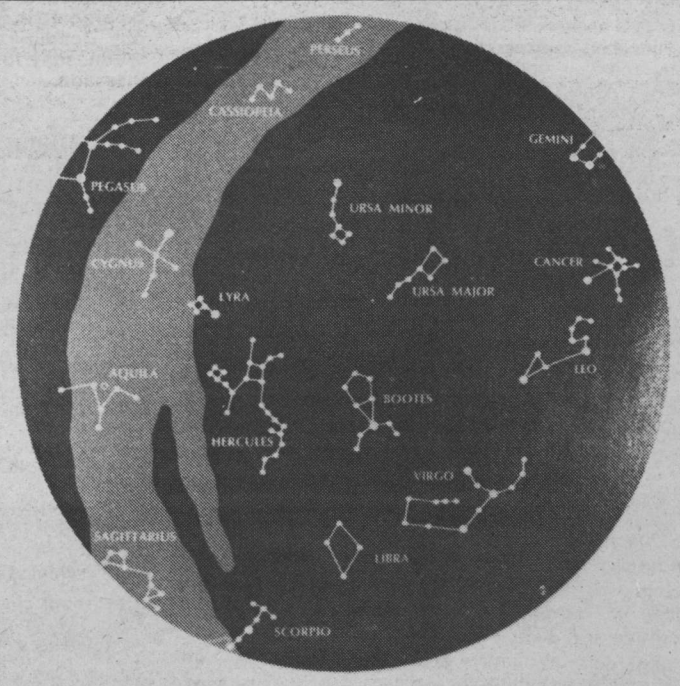
The second postulate addresses the need shared by all generations for space, and for nature and room for the soul. Together with the third, it may be deduced from an idea suggested by Talbot Page: one generation does not have a stronger claim than others to available resources, whether petroleum, abundant wildlife or clean air and water. Intergenerational parity, then, requires that institutions foster over generational time a distribution of resources that will maintain constant living standard.

If the first two fail to dismay the business community, the third postulate will certainly do the trick. Imagine a public trust attorney petitioning a federal court for an injunction against Alaskan wells on the grounds that oil reserves there must be preserved for citizens in the year 2078. Or against mines in Utah to protect future generations' interest in copper ore. Or against subdivision of rich California farmlands to protect their food-producing capability.

Outlining a general theory of posterity rights is easier than devising ways of reducing it to practice. A formidable obstacle in this case is the economist's tendency to discount the future, focus on the quantifiable, and resist questioning the growth-rate-planning mentality. Before any progress can be made, it may be necessary to replace economists as the principal designers of our future. Meanwhile, efforts to reduce carcinogenic and mutagenic exposures on behalf of today's citizens will, in most cases, benefit posterity. The same mechanism applies in the case of consumption rates.

Other reforms cannot be postponed. Within the next few years, our society must allow: court standing for future generations; full-cost pricing to include pollution control costs; increased energy prices to reflect the costs of replacing dwindling stocks of cheap fuels; negative population incentives; a major commitment to efficient use of energy; and strict controls over release of carcinogenic and mutagenic substances. To secure these objectives, courts will have to weigh the equities of posterity equally with present interests at the same tim ethat scholars establish a jurisprudential basis for decisions consistent with the post-industrial age. Ambitious? Yes, perhaps impossible within the next several decades. But more likely when citizens everywhere recognize that passengers yet to arrive on this planet may total 200 billion or more and that the present generation represents but a small fraction of this number.

*Reprinted without permission from the October 1979 edition of the Greenpeace Chronicles.*




Star map of spring skies

photo by W. G. Hardy, Alberta: A Natural History

**During the spring, one can see in the eastern evening sky the constellation of Leo. The white star Regulus marks the lion's heart and Denebola marks its tail. When Leo is due south in the sky two bright stars, Spica and Arcturus, appear in the southeast and the east, respectively. Northwest and diagonal across the sky is Cassiopeia, the Lady in the Chair, which looks like a large W from the horizon. To the west of this star is a hazy patch of light composed of 300 stars clustered together around two points.**

# relative perspectives

by W. Reid Glenn

One of the most visible and significant effects of the Canadian atomic industry on our economy is that due to export sales of reactor facilities. Uranium from Canadian mines has been sold overseas for decades but only recently have complete CANDU reactors been completed outside Canada.

India was one of the first countries to buy CANDU technology; an experimental research reactor. It was from this and other Canadian designed facilities that India developed atomic weapons. Nuclear weapon proliferation is a consequence of atomic electricity production as our experience with India in the last years has demonstrated.

Canada has also assisted Argentina and South Korea with the supply of nuclear power stations. Atomic Energy of Canada (AECL) negotiated poor contracts for their supply and so lost several hundreds of millions of dollars due to inflation during plant construction. In addition, AECL made several large bribes in order to secure these sales. Recently, a West German consortium was awarded further contracts to enlarge the Argentinian nuclear system.

Canada requires any country buying CANDU technology to sign treaties renouncing the use of atomic weapons. Argentina has not done this and since West Germany is not so scrupulous with her customers' actions, the Europeans got the contract.

Recently, Japan decided against buying our CANDU design instead opting to develop this technology on their own. The blemished successes of these AECL export sales have been partly offset by the domestic program.

At home, only Ontario has taken the atom seriously, closing several provincial parks in order to provide room for expansion. A third of Ontario's electricity is raised atomically (equal to twice of all of Alberta's power consumption) and this proportion will rise to two thirds in the next twenty years. The uranium is mined in the north and processed and fired in the south; providing a cheap domestic source of energy for future growth.

Quebec and Manitoba also have nuclear reactors but both provinces are developing hydro schemes rather than atomic ones. The Gentilly reactor on the St. Lawrence River and the Pinawa core in Manitoba, both use organic coolants instead of heavy water employed in all other CANDU plants. Quebec's recent reluctance to go nuclear has led to the end of construction at the federally funded heavy water refinery at La Prade near Montreal.

New Brunswick is now completing the construction of the Point Lepreau reactor which will soon supply electricity to most maritime provinces. However, PEI is now considering the renewable alternatives to atomic power and might not bue the previously contracted amounts of electricity from Point Lepreau. Once the Bay of Fundy tidal power schemes are brought to fruition it is unlikely that atomic power will be able to compete in the Maritimes.

British Columbia, Alberta and Saskatchewan are relying on coal and water resources rather than building an atomic future. Saskatchewan and B.C. both have large uranium deposits but only Saskatchewan is currently exploiting hers. CANDU stations have been proposed to accelerate the development of the oil sands but current plans call for the use of coal or the tar sands itself.

The nuclear industry points to incomplete accounting practises to prove atomic electricity is cheaper than coal and much cleaner. These opinions are open to contention but renewable alternatives are available which can provide more jobs, less inflation and more safety than the nuclear alternative. These concepts will be examined in the future.

# Birds misplaced teeth

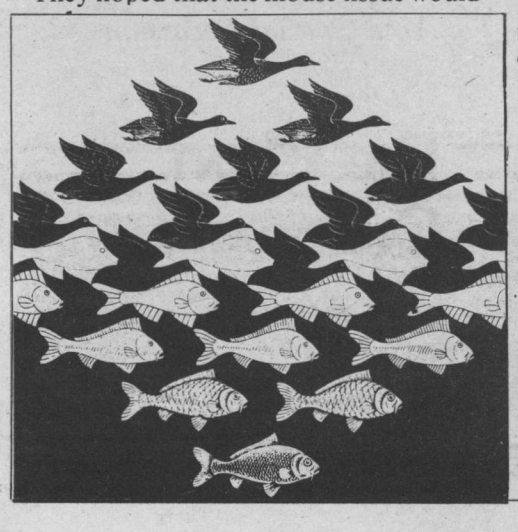
by Sue Eberlein

Modern birds don't have teeth. Birds evolved from reptiles, such as dinosaurs, which did have them. So somewhere in the process of evolution, birds stopped making teeth.

The information to make a tooth or any other part of an animal's body is carried on the DNA. Birds may have lost the section of DNA that provides the information to make teeth.

Recent studies suggest, however, that the information is still present in modern birds. It simply is not used under normal circumstances.

Researchers combined tissues from the mouth area of chickens and mice and allowed them to grow together. They hoped that the mouse tissue would be able to turn on the production of teeth in the chicken. This would occur only if the chicken DNA still contained the information to make teeth.



Other experiments have shown that such interactions occur between different tissues. The outer layer of skin from a chicken can be combined with the inner layer from a lizard. The result is skin covered with feathers. These feathers are arranged in lizard scale pattern instead of normal feather pattern.

The reverse experiment can be done, producing scales arranged in feather pattern.

The chicken and mouse tissue culture did produce teeth. The teeth looked considerably different from normal mouse molars. Researchers did extensive tests to assure that the teeth were made by chicken tissue rather than by mouse tissue.

Chickens have not lost the information to make teeth during evolution. This suggests that other animals may still have information which is no longer used. For example, man may have retained the information to make a tail, as he evolved from the apes.

Changes in the DNA of an embryonic animal can turn on latent information. Such changes are caused by radiation and many chemicals.

The results could include such strange phenomena as chickens with teeth and people born with tails.