

Earth's Biosphere in Peril

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FOREWORD

When I began to work on water pollution in the late 1940s, chemical tests were the norm for estimating the effects of industrial wastes on aquatic organisms. The laboratory toxicity tests were low in environmental realism and involved only a single species that was exposed for up to 96 hours. Ecotoxicology (formerly called *environmental toxicology*) has taken huge strides between the late 1940s and 2011. The science is robust — the methods and procedures have been validated.

In 1948, I was one of two protozoologists on the river survey team formed by the Academy of Natural Sciences in Philadelphia, PA. The charge to the team was to develop biological pollution assessment methods and procedures for streams and rivers. The initial studies were on the Conestoga Creek and, to a much lesser extent, the Brandywine Creek, both in Eastern Pennsylvania. The methods and procedures were subsequently tested and validated in both the United States and Canada in North America and the Amazon River in South America. Much later, US President Bill Clinton presented Dr. Ruth Patrick, the team leader, with the National Medal of Science for her pioneering research.

However at present, all science, and particularly climate science, is in danger because “. . . a committee of the US Congress was poised to pass legislation that would overturn a scientific finding on the dangers of global warming. The Republican-sponsored bill is intended to prevent the US Environmental Protection Agency (EPA) from regulating greenhouse-gas emissions, which the agency declared a threat to public welfare in 2009” (*Nature* 2011). Another serious long-range problem is sea level rise, which will probably affect at least 20 major US cities in this century (Strauss 2011).

Scientists and their evidence are the essential information flow that may enable civilization and *Homo sapiens* to lessen the risks of these dangerous times, and the EPA is being given a hard time with legislation that restricts its ability to take preventative action. Significant cuts by the US Congress in EPA’s funding are also being considered. As a consequence, this “work in progress” on-line book focuses on both science and intergenerational ethics/morality in the hope that the effects of “business as usual” upon intergenerational ethics/morality may change some minds.

References

Nature. 2011. Into ignorance. 471:265–266.

Strauss, B. 2011. American cities and the rising sea. Climate Central 17Feb

<http://www.climatecentral.org/blog/new-study-highlights-180-us-cities-most-at-risk-of-sea-level-rise/>.

PREFACE

When I placed the *Future Eaters: Metaphors and Aphorisms as Environmental Teaching Tools* e-book on my website in 2009 as a “work in progress,” I fully expected it to be my last book. However, Dr. Ronald E. LaPorte subsequently invited me to submit a Legacy Lecture for the National Academy of Sciences Members’ Lectures site (<http://www.pitt.edu/~super1/NAS/nas.htm>) for the Supercourse Lectures (my 14 lectures are included in this volume as Chapter 1). Then I received an invitation in spring 2010 from the *Journal of Cosmology* to submit the manuscript titled “Threats to the Biosphere: Eight Interactive Global Crises” (Chapter 2 in this volume). These two events led to a defining moment for me — I decided to spend the rest of my life writing about the Biosphere. In late February 2011, I started another online, free book on my website. So, here Darla Donald (my editorial assistant) and I go again!

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