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JOHN CAIRNS, JR – AN APPRECIATION OF HIS LIFE AND CONTRIBUTIONS

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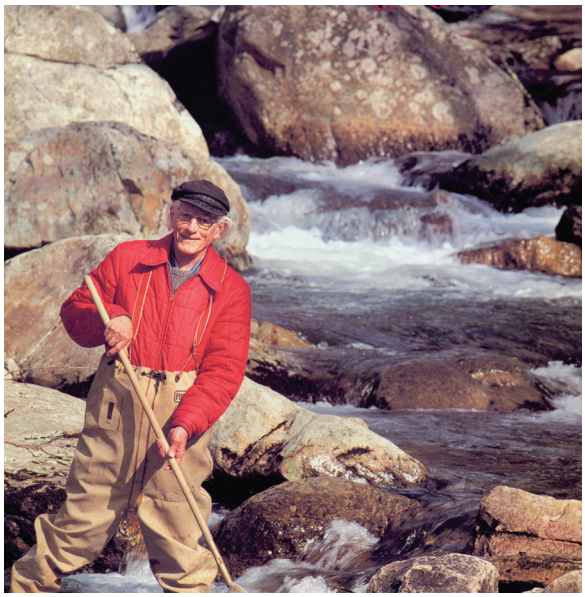

EDITOR'S NOTE

This issue of *IEAM* contains two provocative Learned Discourses from Professor John Cairns, Jr. ("*Integrated environmental assessment and management during a planetary state shift*" and "*Can a species rapidly moving toward a self-inflicted extinction be considered successful?*"), which will be his last publications over an incredibly distinguished career. Unfortunately his health requires more "down" time now that he is 90. We are honored to be publishing his final written submissions and wanted to commemorate it - hence this Appreciation supplied by his long-time Editorial Assistant, which provides details of his life and scientific contributions. We thank Professor Cairns for his previous (2009–2013) contributions to *IEAM*, 9 Learned Discourses and a Letter to the Editor, and wish him well.

Dr. John Cairns, Jr. spent his career developing and applying the best science to environmental problem solving. His accomplishments are diverse, cumulative, and form the basis for many current approaches to solving environmental problems. His influence has been sweeping in several difficult but important areas, representing work over the past 65 years and including books, articles, chapters, and reviews totaling over several hundred publications.

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He is one of the few environmental biologists in the United States elected to the National Academy of Sciences for his sustained contributions to environmental protection. Internationally, he is revered for his contributions to ecotoxicology, for his seminal work in ecological restoration, and for his renowned work in protozoology and microbial ecology and their application to environmental problems.

In 1948, Cairns began his research on the effects of contaminants on biological systems when he became employed as protozoologist for the Academy of Natural Sciences of Philadelphia. Throughout his career as a research scientist, Cairns paid special attention to his first scientific passion, protozoa. He and a colleague developed the most widely used artificial substrate for collecting protozoa and other periphyton, which led to his international recognition as the expert on artificial substrata for collecting all manner of aquatic biota. The so-called "Cairns school" of studying protozoan communities is internationally recognized and, by the late 1980s, colleagues in the People's Republic of China had systematized the method for widespread study of pollution effects in that country's rivers.

As an early practitioner of ecotoxicology in the early 1950s, Cairns' work on thermal stress had a profound influence on the management of waste heat in aquatic habitats. He and numerous colleagues developed automated biomonitoring systems based on computer detection and analysis of fish ventilatory behavior. In the 1970s, Cairns' laboratory determined that multispecies approaches were needed to characterize pollutant effects on emergent community and ecosystem properties and developed small and large artificial streams for testing trace levels of hazardous materials. By the mid-1980s, the USEPA proposed simulated ecosystem testing for pesticides, based largely on Cairns' work.

His work next focused on recovery and restoration, which was critical to understanding not only recovery in aquatic ecosystems but in ecosystems of all kinds. This work identified critical ecosystem processes as key to recovery strategies; he was among the first to denote these processes as "ecosystem services."

All of Cairns' research was essential to his most recent interest in the concept of sustainability. For the last two decades, his attention to this topic has steadily increased, emphasizing that the quality of life for future generations will be markedly affected by the degree to which sustainable use of the planet is implemented.

Cairns' life work spurred the development of many facets of ecotoxicology as a science, standardized the methods used to study chemical toxicity, influenced the systematic study of ecological recovery, and extended the understanding of protozoa and other microbes as models for use in studying complex systems. He set much of the direction of these aspects of environmental science with basic study, applied research, and futuristic thinking, often leading to new models of studying and solving environmental problems. His work is sweeping,

often seminal, and influential. He has typified the engaged scientist ready to think broadly and differently about solving environmental problems.

In January 2013, Cairns had authored 1,749 publications, which includes 65 books. Cairns has been recognized for his professional and scholarly accomplishments by several scientific and governmental organizations. He has been awarded the Founder's Award, Society for Environmental Toxicology and Chemistry; Member, National Academy of Sciences; Member, American Philosophical Society; US Presidential Commendation for Environmental Activities; American Fisheries Society Award of Excellence; Distinguished Scientist Award, American Institute of Biological Sciences; Fellow, Ecological Society of America. His website johncairns.net posts his curriculum vitae, a biographical sketch, an autobiography, and three free e-books.

For the past 38 years, I have been privileged to work for Dr. Cairns as his editorial assistant. Through editing his publications, I have been able to share in his explorations and curiosities of the natural world and humankind's impact on the environment. He has freely shared his technical work and his views on many aspects of scientific study with students, scientists, and governments around the world. I am thankful for this long-term, special experience with such an inspirational and dedicated scientist. The passion with which he assessed issues and offered solutions in his professional life has always been reflected in his personal life of "use and reuse" and "use without abuse." He has lived and portrayed a life that reflects Mother Theresa's message and that of his Quaker heritage: "Live simply so others may simply live." I doff my hat to a true gentleman and scholar.