

there are certainly two good reasons: it is critically important that the young can fly before the nest pond freezes, and presumably the small species fledge fast; perhaps more importantly, only quite small ponds, from which a large loon could not take off, routinely become ice-free in the high arctic.

Irving rightly concludes that there are no major specifically arctic adaptations. The arctic fauna, like the arctic flora, is young and attenuate, made up from various alpine and temperate sources. There are no fully arctic genera, a few arctic species, and many arctic subspecies. The adaptations are mostly refinements of ones seen outside the arctic. The most conspicuous genetic adaptations are these: first, superb insulation; and second, heat-economy devices, notably highly developed counter-current heat exchangers in limbs and

tails, whereby the outgoing arterial blood gives up most of its heat to the returning venous blood. Additionally, there is ample evidence for important degrees of acclimatization (non-genetic conditioning) of birds and mammals, such as is now known to occur in plants. We all experience cold-conditioning to some extent. How sharply we feel those first cool days in November (complaining of the damp, however dry the air), yet by January we cheerfully withstand much severer cold with no heavier clothing.

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Cadmium in the Environment — A toxicological and epidemiological appraisal

By Lars Friberg, Magnus Piscator, and Gunnar Nordberg. Karolinska Institute, Stockholm, Sweden. CRC Press, Cleveland, Ohio, 1971. 166 pp., 37 tables, 50 figures, and 4 plates. \$25.00. Also available from the National Technical Information Service, U.S. Department of Commerce, PB-199 795.

This book was the first comprehensive work on the role that inorganic cadmium plays in the environment. It was most welcomed by physiologists, biochemists, ecologists and physicians, as well as engineers involved with environmental problems. This book focuses on the toxic action of cadmium and its effects on man and animals. The world had its mercury panic a few years ago and now the focus is on cadmium. This publication helps to put the effects of cadmium into proper perspective. It is known that cadmium is one of several factors in Itai-itai disease and has potential long-term effects on kidney function, while the research regarding possible relationship to hypertension has led to contradictory conclusions. This book and subsequent publications indicated below do an excellent job of summarizing the work to date and indicating the amount of research still required on this topic.

I must say, before going further in the review, that since this book appeared two other important publications on the same subject have been published. The first is *Cadmium in the Environment*, II, February 1973, 147 pp. by the same three authors plus T. Kjellstrom also from The Karolinska Institute, Department of Environmental Hygiene, Stockholm, Sweden. This book is also distributed by the NTIS, U.S. Dept. of Commerce, PB-221 198. The second "bible" on the subject is entitled *Cadmium the Dissipated Element*, January 1973, by W. Fulkeron and H. E. Goeller of the Oak Ridge National

Laboratory, Oak Ridge, Tennessee. This bound edition of 473 pages is coded ORNL NSF-EP-21. The Karolinska Institute teams also contributed to this very exhaustive and valuable document.

It is the opinion of some analytical chemists that the Friberg 1971 edition, Chapter 2, dealing with problems of analysis, is relatively poor. No mention of technique as the anodic stripping voltametry is discussed. The other conventional methods are covered in only 3.5 pages. Based on the fact that all the rest of the book is based on levels of cadmium in air, soil, water, food stuff, human and animal tissue, etc., more thought should be given to the most reliable analytical techniques.

The Table of Contents indicates the wrong page numbers for all chapters. Because of the high price of the book such mistakes should be avoided.

The biomedical orientation of the book is well shown by the main chapters' titles: metabolism, respiratory effects and dose-response relationships, systemic effects and dose-response relationships, carcinogenic and genetic effects, the itai-itai disease. The value of the book is without any doubt enormous but the biologist certainly needs more information on the bioaccumulation of cadmium in the lower vertebrates and invertebrates. This is my major criticism. The effects of this metal in the lower animals and plants which are closer than man to the basis of the food chain are still unknown. This is partly why there are no standards as yet with respect to the cadmium content of food in the United States and Canada. It is well emphasized in the Friberg *et al.* book that severe gaps exist in the understanding of cadmium intoxication and on the turnover of cadmium in the biosphere. Accumulation via air and water in food chains should become a priority

for field biologists and analysts. Concerning cadmium in food, a recent leaflet of 31 pages published by the English Ministry of Agriculture, Fisheries and Food in 1973 and entitled *Survey of Cadmium in Food, Working Party on the Monitoring of Foodstuffs for Heavy Metals* (fourth report), gives a good basis for comparison of cadmium levels in food. A provisional tolerable weekly intake of 400–500 micrograms per adult from food and beverages is proposed.

The book is well documented with 405 references (alphabetical order). From the abundant references, the reader realizes rapidly that the data presented are based on a literature survey. This is a review of the state of the situation and the authors should not be blamed for the gaps reported before.

The authors have given a complete review, and the scientific world as well as the public are now aware of that "new" impact. I recommend this book to anyone interested in human and animal health, which is bound to the health of our biosphere. Many peculiarities reported (e.g., cadmium in cigarettes, excretion of cadmium via hair, cadmium-induced testicular necrosis, and influence of chelating agents on cadmium) make the book of high interest to any environmentalist.

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S.O.S. Biosphère: Pollution

Par Clément H. Rondeau, Collège Ahuntsic, Montréal. Éditions Hurtibise HMH, Ltée, Montréal, Québec. 1972. 155 pages, \$3.00

Dans ce volume d'intérêt général et principalement orienté sur la pollution atmosphérique (plus de la moitié du contenu) se chevauchent des chapitres aussi variés que: psychologie et environnement, éducation et environnement, pollution de l'esprit et du corps, étude du plomb et ses effets biologiques, étude sur le monoxyde de carbone, ainsi que beaucoup d'autres sujets formant les vingt-et-un chapitres.

On s'attend, avec un tel titre, que l'auteur traite des problèmes de pollution dans les trois sphères de la biosphère soit l'air, l'eau et le sol. Ces deux derniers environnements sont très peu traités dans ce livre et laissent place à des chapitres tels: additifs chimiques dans les aliments et quelques-uns de leurs effets; les Nations-Unies comme policiers; qui paie la note de la pollution et de la Conférence de Stockholm. De tels titres de chapitres ont sans doute lieu d'être dans ce volume à multiple facettes mais non au détriment des problèmes de pollution des eaux et des sols. En somme, il est de mon avis que le titre n'est pas en relation avec le contenu du volume car la

biosphère est définie comme étant la portion de terre qui contient les organismes vivants et dans laquelle les écosystèmes fonctionnent. Dans cet optique, certaines portions de l'hydrosphère, de l'atmosphère ainsi que de la lithosphère font partie de la biosphère.

Le texte est généralement bien documenté (91 titres dans la bibliographie) et un glossaire de six pages est annexé. Les citations de différents auteurs semblent nombreuses mais il est préférable qu'il en soit ainsi. Le lecteur réalise ainsi l'honnêteté de Monsieur Rondeau qui ne s'est approprié d'aucune citation ou déclaration.

En dépit de certaines lacunes énumérées précédemment, ce volume est à recommander principalement aux étudiants des CEGEP, aux universitaires ainsi qu'au public en général. De telles publications ne peuvent que disséminer l'information nécessaire à une prise de conscience collective sur les problèmes que l'homme cause à son environnement vital.

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Watchers at the Pond

By Franklin Russell. McClelland and Stewart Ltd., Toronto/Montreal. 1961 (reprinted 1972). 265 pp. \$6.95.

This is a fascinating book depicting the seasonal changes in plant and animal life in, over, and under a pond. The hypothetical pond, located in southern Ontario, is realistically described. Emphasis is on the animal life, particularly the smaller forms such as insects and the microscopic bryozoans, etc., and the birds, mice, rabbits, and shrews are all portrayed. The effects of extremes in

weather, such as thunderstorms, blizzards, and drought are shown to be a major cause of mortality in the life around the pond.

The author appears to be first a writer then a naturalist. Anyone who is a fan of the flowery adjective will enjoy this book. The writer successfully overwhelms the reader in sheer numbers. For example, in the description of the fall migration one reads, "thirty thousand crows passed one day. The next day, another twenty thousand passed, and forty thousand the next day, and twenty thousand the



DeLisle, Claude E. 1974. "Cadmium In the Environment - A Toxicological and Epidemiological Appraisal, by Lars Friberg [Review]." *The Canadian field-naturalist* 88(1), 122–123. <https://doi.org/10.5962/p.344358>.

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