Issues in Toxicology

Edited by Bernard Weiss

Aging and Vulnerability to Environmental Chemicals

Age-related Disorders and their Origins in Environmental Exposures

RSC Publishing

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Preface

Aging. We all do it from the moment we are born and it could be likened to the finest wine reaching its prime. It sure looked like aging was on our side in the beginning. We liked it. Think back to all the things you looked forward to as a child or a teenager, like reaching "driving age" and then "drinking age". We could not wait until we got "old enough". But while all that took place aging kept plodding on in its phantom-like manner. For some, acknowledging aging has not been easy as they sought surgical options to cover it on the surface. But even with or without wrinkles and sags, reality soon sets in when we realize that aging is no longer an asset. And near the end when more and more of our diverse body systems let us down, un-relentlessly limiting our bounds, that is when we really understand what aging is all about.

But that's normal aging. In this book Dr. Bernard Weiss tackles a serious health problem that has long been ignored, rapid aging, by bridging numerous disciplines and leaning on the most eminent scientists in the field of public health for their perspective. In so doing he opens the door for discussion on how could this have happened? And, why, since the 1950s, accelerated aging has become more prevalent and over the same time period many chronic endocrine related disorders have reached pandemic level, at a tremendous cost to society?

This book could not be more timely. Globally, over the past several decades, hundreds of professional society and government meetings have been devoted to rapid aging and endocrine disruption to the point where it appears that it may be impossible to reverse the trend unless something is done immediately. The technology that has provided this information is based on entirely new laboratory protocols that test genes, molecules, cells, and tissue at realistic concentrations encountered each day in the environment. You might call it a bottom up approach. It is rich in its discoveries and the use of new words

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creating a whole new vocabulary and a whole new generation of multi-disciplinary researchers. Despite this wealth of knowledge governments have not changed how they test chemicals for their safety. Currently we are at an impasse because the use of toxicological standards based on risk analysis is deeply embedded in the language of federal regulations. While millions have been increasingly succumbing to early onset of chronic disorders, and early mortality, this new language has not been translated into policy for regulatory purposes. For those doing the research who understand the overarching principles of endocrinology it is as though no one has been listening.

Looking back might help understand how this could have happened. Rachel Carson quoted in her 1962 book, *Silent Spring* "A change at one point, in one molecule even, may reverberate throughout the entire system to initiate changes in seemingly unrelated organs and tissues. This concept, familiar in physics, is gaining validity in all fields of biology and medicine." Then she went on to write how difficult it is to demonstrate cause and effect where the ultimate effect may not be expressed for a long time after the initial change in a molecule, or cell, or tissue. Amazingly, she was describing endocrine disruption.

Carson's citations in *Silent Spring* reveal that she had been reading about the changes that were taking place in medical research in the 1950s. I expect that she was looking for clues about cancer, specifically because of her own condition and trying to determine its etiology. She read about the work that was being done in 50s with the adrenal hormones, cortisol and aldosterone, and the anterior pituitary and ACTH. And it was about that time that hormone replacement therapy was being explored and estrogen had caught the interest of the pharmaceutical industry.

I am certain that if Rachel Carson had lived only a few more years she would have discovered the phenomenon called endocrine disruption and I'll just bet that she would have found a better name for it. And perhaps many of the endocrine disorders such as diabetes, obesity, autism, ADHD, fertility problems, Parkinsons, Alzheimers, and the cancers of the sex organs would never have reached current epidemic proportions. There was a big push in the 50s for fundamental research to understand the living organism in order to provide better diagnosis and treatment — and the need to expand on the concept of medicine as a life science and to include biology (Carson's love). Although some advances along these lines have taken place they were not enough to slow down rapid aging.

But there is another reason why it has taken endocrine disruption with its proclivity for rapid aging so long to become accepted as a major threat to humankind. The same trade associations, other industry funded institutions, and corporations that attacked Rachel Carson are still out there 50 years later protecting their products and padding their bottom lines using some of the largest public relations firms in the world to marginalize the science and vilify those doing this 21st century research. And when one takes into consideration that practically every endocrine disrupting chemical in use today was derived from the toxic by-products from coal, oil, and natural gas it becomes even more evident why today, federal health regulations are still based on the odds of

getting cancer at one in million or a thousand, not on the most unthinkable odds like diabetes where today one out of every third child born — and if you are among a minority group — every other child born will suffer the disease.

Humankind is in the midst of a dire health crisis that requires immediate intensive care to survive. The paradigm upon which current government policies and regulations have evolved has failed to protect us. A new level of discourse is needed immediately between science and decision makers creating a toxic chemicals platform or framework using a disease-driven approach that employs the principles of endocrinology. This entity should over-see the creation of an entirely new set of 21st century public health rules that would enable governments to reverse the current crisis. This could happen by making possible the merging of the dialogue between the most brilliant statespersons with a record of independence and integrity and the brilliant spokes persons within the community of scientists who understand the endocrine system. I see this book providing the first major break through in that dialogue and contributing to an urgently needed paradigm shift in how governments protect public health.

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