Media Reviews

Upsizing: The Road to Zero Emissions. By Gunter Pauli. Greenleaf Publishing, Sheffield, UK, 1998. Softcover, 16.95 pounds sterling, 224 pp, 138 × 216 mm. ISBN 1 874719 18 7.

Pauli espouses a cause that attracts much sympathy: improving the well-being of all peoples of the world while avoiding long-term environmental degradation. Regrettably, he does the cause no good by expressing his arguments in pseudoscientific terms and supporting them with inaccurate information. Teachers of science cannot conscientiously recommend this book to their students.

The author questions and dismisses Darwin's evolutionary theory as "just a fine hypothesis" that considers "only one species at a time." He rates Darwin's insights about the earthworm to be of more value than *Origin of Species*.

While not specifically mentioning the laws of thermodynamics, Pauli dismisses what he terms "the law of entropy." He sees the concept of entropy as being an artifact of greedy Western culture and the linear concept of time. He looks forward to a world where "entropy is gone and progress is based on cooperation and respect for diversity."

Pauli proposes the new discipline of "Generative Science." He proposes twenty principles, including "a circular concept of time, whereby everything and everyone will have a new chance in the future" and "the concept of joy." Generative Science "does not search for traditional scientific proof for each step it undertakes."

However, misinterpretations and errors of fact weaken his arguments for the new "science." For example, Pauli states that "it sometimes takes 160 tons of water to recycle a ton of paper": he seems unaware that this water is itself recycled within the mill, and that many such paper mills now operate with zero liquid effluent. For the conversion of cereal straw to papermaking fiber he states (wrongly) that standard practice yields only 13% of the available cellulose, and claims that a new approach (yet to be developed) would yield 90%.

By abolishing the laws of thermodynamics, Pauli is able to define the "Zero Emissions" concept (no liquid waste, no gaseous waste, no solid waste) without worrying about the boundaries ofthe system. He condemns the burning of residues from wood pulping (black liquor) and from sugar production (bagasse). He seems not to appreciate that recovering trapped solar energy renders these industries more sustainable.

Pauli ascribes a personality to "Nature," endowing it with "great intelligence, accumulated after millions of years of experience." He claims that the immune system, being "the most fascinating management system" and being based on a "perfect sharing of information" is the model that we should adopt. The only faulty component is "Homo non-sapiens," particularly the Western variety.

This book contributes little of value to the ongoing scientific and technologic campaign to improve human standards of living, including the environment. Indeed, if it were to succeed in its apparent goal of replacing effective science with the so-called "Generative Science," it could harm that campaign.

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