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BOOK REVIEW

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Gerard Piel: The age of science

Basic Books, New York, 2001. 460 pp, 24×19.5 cm (ISBN: 0-465-05755-1) US$ 40

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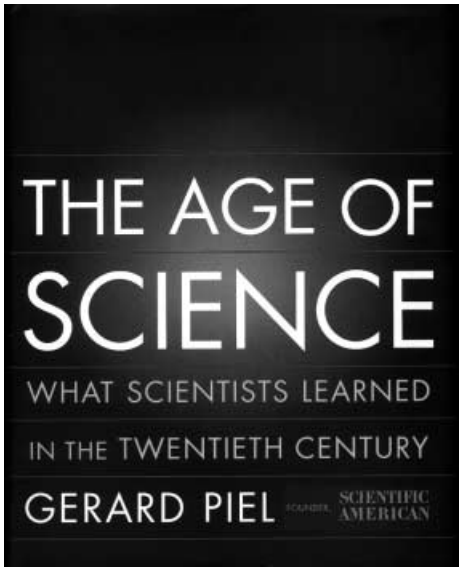
Gerard Piel, who founded *Scientific American* in 1948, is considered to be one of the inventors of science journalism. As a matter of fact, he did not found Scientific American, but relaunched what was then, as Piel put it, a ''moribund'' 102-year-old journal. The renewed magazine soon became popular among educated people interested to know what was going on in science. *Scientific American*, which covers all scientific fields, has reviewed major scientific discoveries that have taken place since 1948.

Gathering in a book ''what scientists learned in the twentieth century'', as the subtitle of *The Age of Science* reads, would have meant putting in a single volume what has filled thousands and thousands of pages of Piel's magazine (which has covered somewhat more than the second half of the last century). The reader should not expect to be confronted with a treaty or encyclopedia of science of the twentieth century, otherwise she or he will be disappointed. In an introductory chapter (''About this book and myself''), Piel describes what he intended to do by writing the book: ''...I have undertaken to tell my readers what I have learned about what scientists learned in the twentieth century...''. However, I think that even this statement does not correspond to what the reader will find in the book. The fact that terms such as ''antibiotic'', ''computer'', ''Internet'' and ''polymerase chain reaction'' cannot be found in the Index surely does not mean that Gerard Piel did not learn about these achievements of the last century. Nevertheless, the book is a most appealing tale of the huge progress of science in the twentieth century as seen by a non-scientist who has been a highly intelligent observer. Piel might have entitled the introduction ''About this book, Scientific American, and myself''. In fact, in addition to being an account of Piel's career as a science journalist, it describes the birth of his magazine. It all began in 1938,



when he went to work in the mass-circulation photo magazine Life and was appointed to cover scientific issues. Piel describes that ''in those days, scientists were wary of the press; they were too often embarrassed by overheated, improbable accounts of their work''. After 70 years, science has become a hot topic in the media. Journalists, who need more than ever the advise of scientists to interpret scientific findings, are confronted with several kinds of attitudes among scientists. Currently there are still those that are wary of the press and think twice before collaborating with journalists. Others, by contrast, are always ready to comment on any new discovery, especially if they know that his o her name as ''an expert in the field'' will come up in the news. Fortunately, there are also scientists willing to help journalists with their comments without expecting any reward, just for the sake of science. From 1948, Piel succeeded in enlisting scientists who, in addition to having carried out research of interest, had the ability to describe their work for an audience wider just their colleagues. Piel explains that the book is his synthesis of

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his necessarily close study, then and now, of the articles published in Scientific American over four decades, and admits that his journal has been a major source in writing the book. One assumes that Piel must have a liking for both physics and biology. In fact, his tale of scientific achievements over the twentieth century focuses mainly on these fields.

In Chap. 1 (''Science is what scientists do''), Piel wonders how something came from nothing and how something came to think about nothing. These two questions are as ancient as the human species, who is constantly in search of the right answer. In science, no one can ever be sure to have reached the right answer. Only the physical reality accessible to experience can be considered rationally. Never before have there been so many paradigm shifts as during the twentieth century. Paradoxically, it was the advancement of science that led to the awareness of science's own fallibility. Chapters 2 (''Revolution at the ground of knowledge''), 3 (''Light and matter'') and 4 (''Space and time'') ''show the world around us reconstructed in continuity with the immensities now opened up within it and outside it''. The last three chapters are devoted to topics in biology. Chapter 5 (''The living cell'') is an account of the main discoveries in cell biology: the origin of the cell and the earliest cellular fossils; cellular molecular structure; energy transformation in the cell; the distinctions between prokaryotic and eukaryotic cells; and the role of genes in inheritance. Chapter 6 (''Earth history and the evolution of life'') tells the story of both the planet as the shelter of life and of life itself in the light of the discoveries made during the twentieth century. The tale of human evolution in Chapter 7 (''Tools and human evolution'') focuses mostly on cultural evolution undertaken by *Homo sapiens*. The book even goes beyond discussing scientific discoveries to explore science's new frontiers.

The endnotes, in addition to ''offer clues to, if not citations of'' Piel's sources – as he writes – are a most interesting annotated bibliography. In addition, numerous, very original, hand-drawn and annotated illustrations make the book even more attractive. Nevertheless, the notes included in the illustrations, can be difficult to interpret, were it not for the legends, which are very explanatory. A double-page drawing evokes the famous ''Powers of ten'', an article by Philip and Phyllis Morrison published in Piel's magazine in the 1970s, that tied together phenomena that occur over a wide range of spatial scales; it tried to awaken an appreciation of the scale of the physical world by a succession of images which differed one from the next by factors of ten. The homonymous film (1978, by C. Eames and R. Eames) and book (1982, by the Morrisons, published in the Scientific American Series) are still around, and multimedia versions are also available on the Internet. *The Age of Science*, even if an incomplete account of scientific discoveries over the last century, is worthwhile reading. It is an engaging book, beautifully written, by a non-scientist who has the ability to convey the message of science in a way understandable to both scientists and lay people.