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Step in Education: The Invention of Writing"; "5.3 The Use of Knowledge"; "5.4 Opening the Human Mind: Asymmetries and Nonlinearities"; "5.5 Technical Analysis of Tools and Models"; "5.6 Being Proactive"; "6 Technology"; "6.1 Technology and Society"; "6.2 A Brief History of Technology"; "6.3 Biomedical Engineering. A Case Study"; "6.4 Meta-Analysis and the Fermi Principle"; "6.5 Technology's Impact"; "6.6 The Risk of Human Errors"; "8.7 Fracking's Downside"; "8.8 Solar"; "8.9 Wind Power"; "9 Challenges of Nuclear Power Production"; "9.1 An Introduction to Nuclear Power"; "9.2 Nuclear Power Production in France"; "9.3 Germany Abandons Nuclear Power"; "9.4 Japan's Nuclear Power Catastrophe"; "9.5 We Should Learn from Past Accidents"; "9.6 Evaluating the Life Cycle of Nuclear Plants"; "9.7 The Challenge of Decommissioning Nuclear Plants"

Sommario/riassunto

The aim of this book is to explore science and technology from the viewpoint of creating new knowledge, as opposed to the reinterpretation of existing knowledge in ever greater but uncertain detail. Scientists and technologists make progress by distinguishing between what they regard as meaningful and what they consider as secondary or unimportant. The meaningful is dynamic; typically, the less important is static. Science and technology have made a major contribution to the culture and to the standard of living of our society. From antiquity to the present day, the most distinguished scientists and technologists have been thinkers, experimenters and persons willing and able to challenge "the obvious". Technology develops products and processes based on the breakthroughs of science. If technologists fail to steadily upgrade their skills, tools and methods, they will only be as good as their last design, risking obsolescence. Using practical examples and case studies, this book documents the correlations existing between science and technology, and elucidates these correlations with practical applications ranging from real-life situations, from R&D to energy production. As it is a salient problem, and a most challenging one to our society, power production has been chosen as a major case study. The holistic approach to science and technology followed by this text enhances the ability to deliver practical results. This book is intended for students and researchers of science, technology and mathematical analysis, while also providing a valuable reference book for professionals. Its subject is one of the most debated problems of mankind.
