

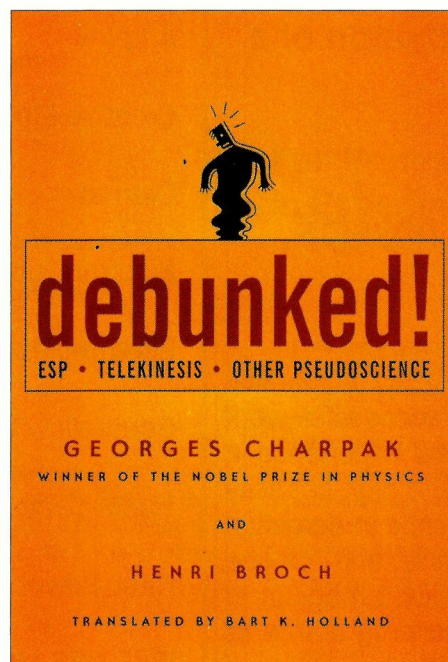
Debunked! ESP, Telekinesis and Other Pseudoscience by Georges Charpak and Henri Broch, translated by Bart K Holland, Johns Hopkins University Press. Hardback ISBN 0801878675, \$25.

Georges Charpak will, as they say, need no introduction to most readers of the *CERN Courier*. Henri Broch, author of *Au Coeur de l'Extraordinaire* and a contributor to the American magazine *Skeptical Inquirer*, is perhaps less familiar to English-speaking readers. Now, their short book *Devenez Sorciers, Devenez Savants* has been translated into English by Bart Holland, with the title *Debunked! ESP, Telekinesis and Other Pseudoscience*.

Pseudoscientific mumbo-jumbo has been engulfing the US long enough for an extensive sceptical literature to have grown up around it. Stories about firewalking, dowsing and spoon-benders have already been dealt with by James Randi in *Flim-Flam!*, Martin Gardner in *Science: Good, Bad and Bogus*, and, less originally in my opinion, by Victor Stenger in *Physics and Psychics*. Charpak and Broch treat all these matters with new insight and humour, but include many new examples to show that even France, home of the Cartesian philosophy of doubt and scepticism, is now apparently ready to believe almost anything, provided it is vouched for by fashionable figures in show business or the media.

Thus, in 1982, Broch found that among undergraduate science students at Nice, 52% believed relativistic time dilatation to be pure theoretical speculation, while 68% thought that paranormal spoon-bending was scientifically proven. More recently, Elizabeth Teissier, astrological adviser to millions (including, she would have us believe, François Mitterrand), was awarded a PhD by the Sorbonne for a thinly disguised PR job vaunting her craft.

I cannot resist mentioning two of my own favourites here: Paco Rabanne, the famous fashion designer, ran away from Paris before the 1999 eclipse because he was afraid the sky might fall on his head; and the failed rock musician and racing-car writer Claude Vorilhon, a.k.a. Rael, recently got word about particle physics from the Elohim – the “extraterrestrial guardians”, he says, “of peace, non-violence and harmony at all levels of infinity”. Vorilhon e-mailed many physicists to pass on the message not to mess with the universe by constructing super-colliders; science is good



and should be unlimited as long as it fuses elements, it would seem, but it should never be used when breaking or cracking infinitely small particles. As Charpak and Broch point out, the more vague, hollow and absurd the claim, the deeper the truth drawn from it – a phenomenon they term the “Well Effect”.

In his introduction, Bart Holland explains that he has tried to be true to the French original. The result will sometimes be quite confusing to English-speaking readers unfamiliar with what he calls the “glorious Gallic rhetorical style”. In addition, he has not always followed his own rule of keeping sections dealing with popular French culture and public figures intact, but has supplemented them with explanatory footnotes. In several cases, I had to turn to the original version to put arguments into context.

In their final chapter, Charpak and Broch strongly criticize the media, which they see as the natural ally of science and reason, for often (unwittingly or not) promoting the bogus claim that all ideas are of equal value, under the guise of journalistic even-handedness. The authors also differ from their English-language counterparts in that they see wider dangers in pseudoscience, such as its threat to democracy and the emergence of a multinational big business to market it. The authors’ parting advice to the reader is that critical faculties should be allied with human ones. This was more or less the position taken by Sir Walter Raleigh, who once wrote, “The skeptick doth neither affirm nor deny any

position but doubteth of it, and applyeth his Reason against that which is affirmed, or denied, to justify his non-consenting.” He was beheaded shortly afterwards.

John Eades, Tokyo.

Kosmische Impressionen – Gottes Spuren in den Naturgesetzen (Cosmic Impressions – Marks of God in the Laws of Nature) by Walter Thirring, Molden Verlag. Hardback ISBN 3854851103, €24.80.

A number of popular books have been published in recent years describing cosmological evolution from the Big Bang to the origin of human life. In this book, the author has the courage to leave well trodden ways and to try to explain the most abstract concepts in modern physics – the amalgamation of Einstein’s general theory of relativity with quantum mechanics – in words comprehensible to non-experts.

His main message is that the cosmos and nature, as we discover them, have evolved as a mixture between the laws of nature and accidental conditions that leave room for unscientific arguments. The climax of the book is a discussion of the anthropic principle in its various forms, which is criticized from a rational point of view. In the end, it is admitted that a purely rational explanation of cosmic evolution cannot be given and religion has to come in. However, on the way to this knowledge, one discovers a grandiose picture of nature that teaches us to respect the miraculous complexity of the universe.

Before he comes to the final conclusion, Thirring covers many topics starting with the evolution of the cosmos: the Big Bang, the origin of the chemical elements, the formation of stars, the peculiarities of our planetary system and the origins of life. The latest achievements in particle physics, the role of black holes, supernovae and the breaking of symmetry rules are presented. The author also amusingly suggests a new word “Kleberlinge” (a little something that sticks things together) as the German translation of “gluons”.

The author has the courage to mention some fundamental questions that are usually swept under the carpet in daily scientific life, e.g. “What really is mass?”, “Is matter divisible infinitely often?” and “Do Feynman integrals contain an element of teleology?”. On almost every page, one becomes aware that the author – a mathematical physicist – is an outstanding expert in this field. He starts most

explanations from the mathematical or basic physical concepts, but avoids all complicated formulae and exposes the reader only to very simple expressions and calculations that should be known from early schooling.

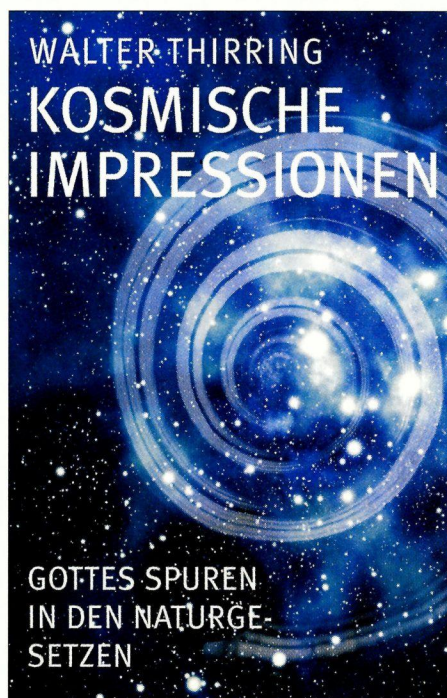
A typical example is the way in which Thirring treats the formation of life. This topic is discussed almost exclusively from the point of view of the increase of order in living things, which does not contradict the universal law of increasing disorder (entropy). In a kind of play (covering 17 pages and involving elements of chaos theory), the author shows that mathematical rules exist that allow the creation of order even if entropy as a whole increases, obeying the basic theorems of thermodynamics. The chapter on the special role of water in the existence of life and its strange properties is very nice.

Thirring acquaints the reader with the typical way of scientific thinking in orders of magnitude, which regrettably is not applied as much outside of the natural sciences. But he also asks the reader to follow logical deductions that might not be so easy for laypersons. On the other hand, he considers some old problems from a fresh view, which is sometimes quite amusing – for example, the comparison between the age of the universe as deduced from the Bible and that derived from modern scientific experience.

Interspersed throughout the text are anecdotes concerning meetings between the author and some famous physicists such as Albert Einstein and Wolfgang Pauli. Quite rightly, preference is given to the author's Austrian compatriots who have sometimes not received the proper credit, such as Fritz Houtermans and Bruno Touscheck.

Finally, a few technical remarks may be added. In order not to scare the reader, the author has relegated some topics to annexes. However, the mathematical level in the annexes is not too different from some chapters in the text; one would have liked to have a more extended reach. The publisher has done a careful job, and only a few printing errors could be detected.

For readers who are eager to learn about the fundamental concepts concerning cosmological development, the structure of matter and the interplay between the laws of nature, this book will give a good overview. It is not easy bedside reading and requires some effort to follow the arguments of the author. However, no mathematical knowledge



is required and many parts are amusing to read. The language is almost poetical, in particular when more philosophical issues are discussed, but in the more scientific parts, this might lead to misunderstandings. The *leitmotiv* of the book is: "There are things whose development is decided by the laws of nature; there are things whose fate is outside human reason; but all this is determined by a higher authority." This book, like many others, cannot answer questions such as "Where do I come from?" or "What is the sense of my life?" mentioned in the foreword by cardinal Franz König, because there is no scientific basis for the answers. It proves, however, that there is no conflict between truth in science, based on reproducible experiments, and truth in religion, based on revelation.

Herwig Schopper, University of Hamburg and CERN.

Virtual Worlds: Synthetic Universes, Digital Life and Complexity by Jean-Claude Heudin (ed), Westview Press. Paperback ISBN 0813342864 \$35 (£26.50).

Now published in paperback, this book aims at developing a new understanding of the role of computer-generated "virtual worlds" in science, business, computer games, education, training and simulation. It introduces the virtual world as a field and reviews its historical roots, goals and methodology. Contributors investigate

relationships between the natural and the artificial, and address technical developments and practical applications.

Quantum Field Theory of Many-Body Systems: From the Origin of Sound to an Origin of Light and Electrons by Xiao-Gang Wen, Oxford University Press. Hardback ISBN 0198530943, £44.95 (\$79.50).

This Oxford graduate text provides a paedagogic and systematic introduction to the new concepts and quantum-field theoretical methods in condensed-matter physics. Topics covered in the book include boson condensation, Fermi and fractional statistics, topological/quantum order, spin liquids and string condensation.

Contemporary Accelerator Physics by Stephan Tzenov, World Scientific. Hardback ISBN 9812389008, \$76 (£46).

This non-traditional book on accelerator theory aims to create a reference material containing contemporary methods of classical mechanics, statistical physics and plasma physics that are relevant to the physics of charged particle beams. These include the Hamiltonian formalism, canonical perturbation theory, the renormalization group and the Vlasov equation.

Beautiful Models: 70 Years of Exactly Solved Quantum Many-Body Problems by Bill Sutherland, World Scientific. Hardback ISBN 9812388591, \$78 (£48). Paperback ISBN 9812388974, \$38 (£23).

This book provides a broad introduction to the subject of exactly solvable many-body quantum systems, including Bethe's famous solution of the 1D Heisenberg magnet. It is suitable for graduate students and non-experts who want an overview of some of the classic and fundamental models in the subject.

Direct Nuclear Reactions by Norman Glendenning, World Scientific. Hardback ISBN 9812389458, \$68 (£41).

Reprinted 20 years after first publication, this classic text aims to provide the novice with the means of becoming competent in research on direct nuclear reactions, and the experienced researcher with a detailed discussion of advanced topics. It assumes only a modest knowledge of quantum mechanics and some acquaintance with angular momentum algebra.