

Bookshelf

Summer Bookshelf

With summer well under way in the northern hemisphere, this Bookshelf features less technical books, and includes cartoons and even a film review – all on particle physics or closely related themes.

Un diplomate dans le siècle ; souvenirs et anecdotes

By François de Rose

Editions Fallois

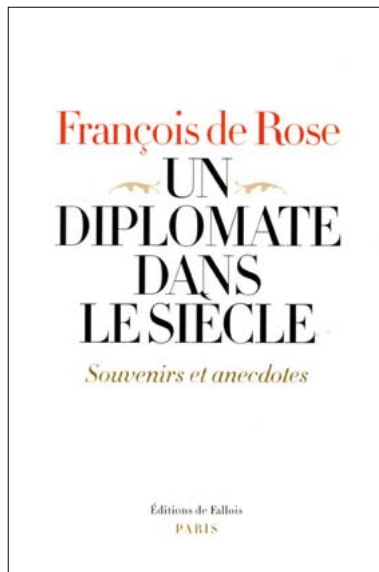
Paperback: €10

Also available at the CERN bookshop

François de Rose est un grand témoin du XX^e siècle. Né en 1910, il a vécu les deux guerres qui déchirèrent l'Europe, la reconstruction de la paix, et tous les grands événements du monde d'hier. Diplomate, il a évolué dans les cercles des puissants et de leurs conseillers, et s'y fit des amis. Un jour de 1946, il fit la connaissance de Robert Oppenheimer et se lia d'amitié avec le célèbre physicien. Dès lors, il mit ses talents de diplomate au service des scientifiques qui voulaient reconstruire la science fondamentale en Europe. Il devint ainsi l'un des fondateurs du CERN. Il poursuivit ensuite sa carrière diplomatique, comme ambassadeur et spécialiste des questions stratégiques et militaires.

François de Rose n'écrivit jamais ses mémoires, bien que ses amis l'aient pressé de le faire. Mais à l'orée de ses 103 ans, il s'attela à la rédaction d'un recueil de souvenirs. Ce petit livre, intitulé *Un diplomate dans le siècle*, parut le 13 mars 2014. Dix jours plus tard, son auteur s'éteignait à Paris. Le CERN perdait son dernier fondateur.

François de Rose était un homme plein d'esprit, et un esprit libre. Son élégance et sa liberté de pensée scintillaient au travers de ces anecdotes relatées au gré « *des caprices qui (lui) restent de mémoire* ». François de Rose raconte « *un temps que les moins de cent ans ne peuvent pas connaître* », il égrène avec humour des histoires qui ont marqué sa vie. Du baïsemain à l'impératrice Eugénie en 1920 à la fête d'anniversaire d'Henry Kissinger en 2013, il est tout à fait fascinant de parcourir cette existence longue et riche, celle de l'un de nos contemporains qui fut aussi le contemporain de George VI et d'Albert Einstein. Cet humaniste livre une foule d'anecdotes sur la diplomatie au XX^e siècle, les hasards heureux ou malheureux, les grandes phrases et les petites histoires qui construisent l'histoire avec un grand « H ».



Le recueil fait une belle place au CERN, « *la plus belle plume à mon bicorn* », dit-il. François de Rose raconte ses rencontres avec Niels Bohr, Pierre Auger ou Robert Oppenheimer, de grands noms de la physique aujourd'hui entrés dans la littérature. Il relate comment il embrassa la cause du CERN et sa fierté d'avoir vu ce projet couronné de succès.

Écrit avec élégance, ce recueil s'apprécie comme une boîte de friandises, exquises et légères, aux saveurs d'autan.

● Corinne Pralavorio, CERN.

How Big is Big and How Small is Small: The Sizes of Everything and Why

By Timothy Paul Smith

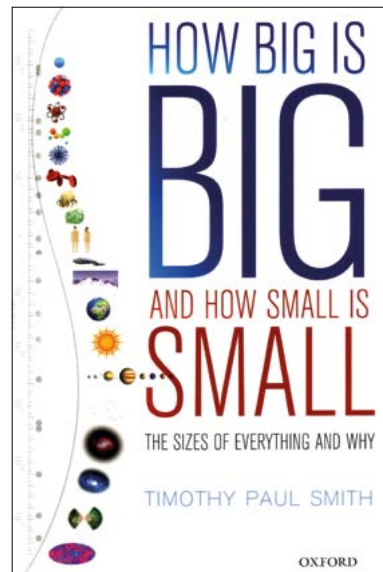
Oxford University Press

Hardback: £25

Also available as an e-book, and at the CERN bookshop

This book canters through the sizes and lifetimes of things, from the outermost reaches of the universe to the confined locality of quarks, telling us what is found where and why, and is, according to the publisher's website, suitable for "interested general readers as well as professional scientists" – a broad church.

In scanning 45 orders of magnitude, the author presents a wealth of information on "everything", from cosmology to string theory, with passing reference to cooking, football, square dancing and more. The narrative is exuberant and many of the facts



are little gems, but they are jumbled up, disordered and congested. The book reads like a series of digressions and there are enough typos and mistakes – bacteria and criteria are plural not singular, the shadow on a sundial is not cast by a gnome – to irritate anyone trying to stay the course.

Concepts seemingly pop up out of nowhere, reappearing again (and again and again) when the plot is all but lost. Much of the material is erudite, abstruse and irrelevant, such as "The delta particles Δ^- Δ^0 Δ^+ are like neutrons and protons but with complex spin." Spin, complex or not, is not in the too-brief index, so the reader cannot check whether it has been defined earlier, or indeed anywhere, and the doubly charged member of this quartet is actually the Δ^{++} , although by now – page 123 – it is debatable whether even the most interested readers care. And why should they?

Some aggressive editing would have been in order, not only to fix imperfections and remove chunks of repeated or unnecessary text, but also to avoid slowing down the observant with infelicitous phrasing, for example, "A number of species in the new world and the old world have the same common name because, at least superficially, they look the same, for example the robin and the buffalo."

And in a cup of water drawn from an ocean today, how many molecules were in a cupful poured into the oceans long ago? After 10 pages of exhaustive and exhausting

Bookshelf

accounts of the work of Avogadro, Dalton, Gay-Lussac, Loschmidt and Maxwell, we arrive at the numbers. There are 3.3×10^{24} water molecules in a cup and 1.3×10^{22} cups in the oceans. So, 250 of the original molecules are in today's cup and, although not stated, the oceans contain 4.3×10^{46} water molecules. Yes? No! On the following page, "there are about 8×10^{45} molecules of water on Earth."

I was once told, if lost for affable words when asked for an opinion on something quite extraordinary, to say "astounding!" This book is astounding, which is a pity as it could and should have been excellent.

● Peggie Rimmer, *Satigny/Oxford*.

Henri Poincaré: A Biography Through the Daily Papers

By Jean-Marc Ginoux and Christian Gerini

World Scientific

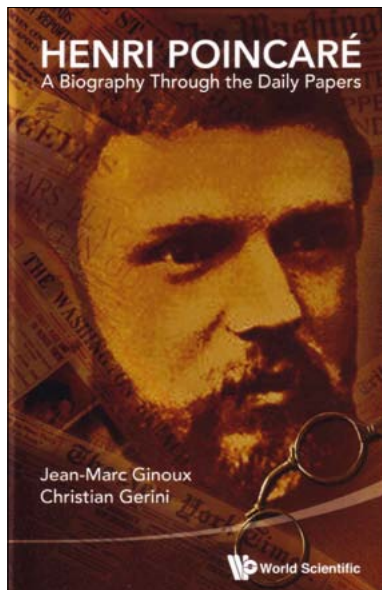
Hardback: £19

E-book: £14

Henri Poincaré: A Biography Through the Daily Papers – where papers clearly include letters, because many are included – has caused some confusion in my mind. Turning the pages, it is hard to know where I am in time, and the events that are described seem to be of sub-relevance to what I was keen to read about. Two towering examples concern Poincaré's relation to politics and relativity.

I note that despite extensive discussion of his interaction with the daily press, there is only the briefest mention that Henri Poincaré had an influential cousin, Raymond Poincaré, who was president of France during the years 1913–1920 (and so covered the First World War), and before that a member of the French parliament, and on several occasions minister or prime minister. I had been hoping to learn how close Henri was to Raymond and how this impacted on the opinion of the French public on both of them – a genius mathematician and a powerful politician from the same family.

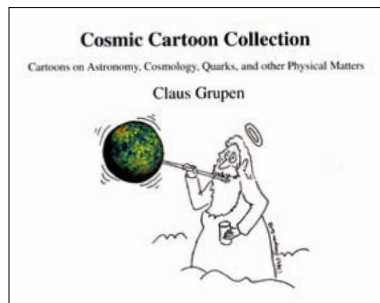
I also hoped for a discussion of the relation of Henri Poincaré to Hendrik Antoon Lorentz and Albert Einstein. There is only one phrase, on page 212 at the end of the subsection on an "old quarrel" with Einstein – and in my view this is inaccurate. What I know from having read some of Poincaré's research papers is that it was Lorentz who was castigated by Poincaré for "needing five pages where five words suffice" (I paraphrase). The situation with Einstein seemed more complex. Here I was seeking clarity. Everybody "knows", and therefore in accord with diplomatic traditions, this book avoids any explicit mention of what is, in my opinion, the historical-context issue of importance.



A search on the web reveals a recommendation letter from Poincaré regarding the appointment of Einstein at ETH-Zurich written in November 1911 – see www.lettersofnote.com/2013/11/one-of-most-original-thinkers-i-have.html. In this letter, Poincaré the mathematician, who died in 1912, characterizes Einstein the young physicist, who became noticed around 1907–1912, as an oddity among scientists, deserving a mention for this reason: "Mr Einstein is one of the most original thinkers I have ever met," and going on to say, "Since he seeks in all directions one must... expect most of the trails which he pursues to be blind alleys." This shows that Poincaré died in ignorance of the fact that Einstein had already created several new paradigms of science, of which (special) relativity was directly related to Poincaré's own work. I wonder if there is any other evidence in the press or in letters about what Poincaré knew and thought about Einstein?

Having seen this letter, I believe that in November 1911 Poincaré had no appreciation of the subtle nature of Einstein's revolutionary work. Poincaré, who worked on the generalized Lorentz transformations, does not mention $E=mc^2$, arguably the most famous equation, published six years previously. By 1911 Poincaré had created the tools that were needed to prove $E=mc^2$ in more abstract mathematical terms, and yet he showed no interest in following Einstein's footsteps. Why?

With the two pivotal issues – Henri Poincaré's relation to the family's political



power and his competition with the young and most-important scientist of the epoch – not addressed, I wonder what priorities led to selection of the material that is presented. There is the "Dreyfus affair", which is discussed amply and where Poincaré played an honourable role. This was clearly of contemporary importance, but historically, looking at Poincaré the pre-eminent mathematician, this is a footnote at best. On the other hand, the presentation of his involvement in Ernst Mach's thinking and the Earth's rotation is the high point of this small book, and might yet justify its presence in the history of science literature.

● Johann Rafelski, *University of Arizona*.

Cosmic Cartoon Collection: Cartoons on Astronomy, Cosmology, Quarks, and other Physical Matters

By Claus Grupen

Universitätsverlag Siegen

Paperback: €5

Cartoons about science often take on a life of their own, as people copy them to add interest to their presentations, hand them on, add them to their websites, blogs and so on. I once found an excellent one about neutrinos left on a photocopier, which later became a key part of some of my talks. What often happens is that the name of the cartoonist becomes lost as the cartoons become widely spread – especially if the signature is small and becomes blurred with multiple copying. That seems to be the case with some of Claus Grupen's work. Indeed, I was recently asked to identify the source of a familiar cartoon about the Higgs boson. Only after failing to find the answer via Google, did I remember that Grupen draws cartoons – and, yes, it was one of his.

Probably better known as a physicist and author of a number of textbooks, for example, on astroparticle physics (*CERN Courier* January/February 2006 p54), he also has a talent for sketching, and so could create his own amusing visuals to accompany his lectures. He has now assembled a range of his output in this small book published by Siegen University, where he has been professor of

physics for many years.

As advertised in the subtitle, the cartoons cover a variety of topics in physics, but mainly focus on phenomena at the largest and smallest scales. Some are decidedly whimsical, while others are more didactic, and some seem to hark back to an earlier age in terms of the representation of women. This said, there is enough variety to bring a smile to most physicists, and at least now when people use one of Grupen's cartoons, they might know whom to credit.

● *Christine Sutton, CERN.*

Film review

Particle Fever

"He was ALWAYS there!" This was the reaction of CERN scientists who spent years being followed by film-maker Mark Levinson. The result is *Particle Fever* – a feature-length documentary about CERN, which has been touring cinemas and festivals, reaching audiences far beyond particle physics. Why? Because Levinson manages to capture, through his narrative and character-driven piece, a compelling story of passion, disaster, loss and then triumph. It is not "boy meets girl", but scientists build accelerator, scientists lose accelerator (in the September 2008 incident), scientists get accelerator running again and find elusive particle – cue thunderous applause.

The film focuses on a handful of CERN characters, from the ATLAS experiment mainly: Fabiola Gianotti, Martin Aleksa and Monica Dunford, together with Mike Lamont from the accelerator side. While this skews the film away from the reality of thousands of collaborating physicists, it enables a picture to form through the eyes of these protagonists of passionate people working together towards a common goal. Levinson weaves in US-based theorists David Kaplan, Nima Arkani-Hamed and Savvas Dimopoulos to stitch together a dramatic narrative of a mighty quest for the Higgs boson. In being swept along by the action, the audience is also taught a fair amount of physics with the help of beautifully designed graphics. My most memorable scene is the moment of the first LHC collisions, where Levinson's use of music and kaleidoscopic imagery leaves the audience captivated by the almost spiritual exaltation of this scientific achievement.

This US film-maker aiming at a US audience has, inevitably, made an American film, with gutsy postdoc Monica and self-assured theorists. A great deal of the film is dominated by American accents, so much so that I felt that the international spirit of CERN became somewhat neglected.



Nonetheless, Monica delivers a spectacular performance and was by far my favourite "character", with her candid pieces to camera and analogies: "The entire control room is like a group of six-year-olds whose birthday is next week... and there'll be cake."

There is something incredibly heart-warming about watching your place of work portrayed dramatically on the big screen. Goosebumps came in waves with the film's twists and turns, and I came away thinking "Wow, I work there." As a result, I pity my poor family, who will all have to watch this at Christmas, whether they want to or not!

● *Kate Kahle, CERN.*

● *Particle Fever* is currently touring cinemas and festivals, and is available to buy as an HD download worldwide from 15 July. For more details, see <http://particlefever.com/>.

Books received

Symmetry and Fundamental Physics: Tom Kibble at 80

By Jerome Gauntlett (ed.)

World Scientific

Hardback: £38

Paperback: £18

E-book: £14



Tom Kibble – recently knighted (p36) – is an inspirational theoretical physicist who has made profound contributions to the understanding of the physical world. This book is a compilation of papers based on the

presentations given at a symposium held in March 2013 at the Blackett Laboratory, Imperial College London, to celebrate his 80th birthday. The symposium profiled various aspects of his long scientific career, with talks from Neil Turok, Wojciech Zurek and Jim Virdee, and in the evening, Steven Weinberg and Frank Close.

Microcosmos: The World of Elementary Particles. Fictional Discussions between Einstein, Newton, and Gell-Mann

By Harald Fritzsch

World Scientific

Hardback: £18

Also available at the CERN bookshop



Suitable for non-experts in physics, this book provides a broad introduction to the field of particle physics through fictional discussions between three prominent physicists – Albert Einstein, Isaac Newton, and Murray Gell-Mann – together with a modern physicist. Matter is composed of quarks and electrons. By following these discussions, the reader should acquire an overview of the current status of particle physics and come to understand why particle physics is an exciting field.

Physics and Our World Reissue of the Proceedings of a Symposium in Honor of Victor F Weisskopf

By Kerson Huang (ed.)

World Scientific

Hardback: £45

E-book: £34



As the proceedings of a symposium that took place in 1974 in honour of Victor Weisskopf – the well-known theoretician, who was CERN's fifth director-general during the years 1961–1966 – this volume contains papers by leaders of physics at the time, including Max Delbrück, Murray Gell-Mann, Hans Bethe, Tsung-Dao Lee, Ben Roy Mottelson, Wolfgang K H Panofsky, Edward Purcell, Julian Schwinger, Stanislaw M Ulam and others.

While some of the papers address problems in the philosophy of physics and in physics and society that are timeless in nature, the symposium has a further significance. It took place at a historic juncture of particle physics – the emergence of the Standard Model as the result of experiments that pointed to the existence of quarks. Some of the papers reflect both the pre-quark and post-quark points of view. For these reasons, these proceedings merit reissue and re-examination.