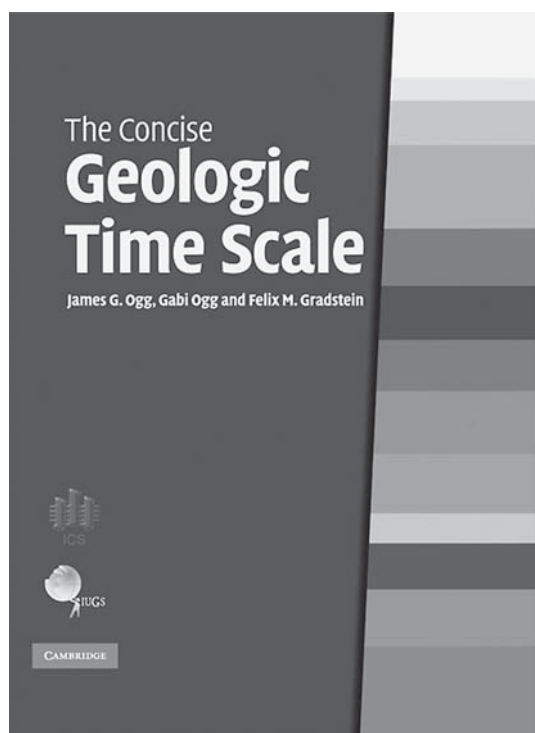


The concise geologic time scale, by James G. Ogg, Gabi Ogg & Felix M. Gradstein, 2008. Cambridge University Press, Cambridge, United Kingdom (order through: www.cambridge.org/uk/catalogue/catalogue.asp?isbn=9780521898492). Hardback, 177 pages. Price GBP 20.00. ISBN 978-0-521-89849-2.



The book on which this concise edition is based, is "A geologic time scale 2004" (Gradstein et al., 2004). That book was not easy to handle, which must have been the reason for this more handsome book that might be considered as a summary, as I did not find any relevant new data that were not already included in the 2004 time scale. The few differences are hard to find; as mentioned in the introduction: "... it was decided to retain the same numerical time scale that was used in ... (Gradstein et al., 2004) for the majority of the stage boundaries, except if the ratified definitions after 2004 for those boundaries are at a different level from the previous "working" versions ...". That doesn't really help.

The book should help geoscientists to improve their understanding of the Earth by a more accurate framework for correlation. However, where correlations were based for a long time on lithostratigraphy, it seems now to become generally accepted that correlations

are based on chronostratigraphic data. That may have advantages if one wants to compare simultaneous developments in different regions of the world, but work on a smaller scale may be hampered because the relevance of diachronic rock units may become obscured. It is, obviously, of great scientific interest to know very precisely how old specific rock units are, but one should realize that only very few rock units can be dated with some precision, and that all other correlations must inevitably be based on litho- or biostratigraphic correlations.

Considering the fact that any correlation includes subjective elements (even – and certainly – in the case of radiometric dating) this implies that chronostratigraphy is rather an academic than a practical tool. One might therefore wonder whether all geoscientists who work in practise must be confronted with new chronostratigraphic names; and particularly with names of which the status is not really clear (e.g. Tertiary, Quaternary). Of course, this is no criticism on this book: the same holds obviously for the 2004 edition. Moreover, the decision makers of the IUGS must have realized that future generations of earth scientist will have problems with 'old' publications in which the chronostratigraphic terminology of the past has been used. This becomes even more problematic if one realizes that the basis of many chronostratigraphic units is no longer based on 'tangible' data (such as the first occurrence of a specific fossil) but on characteristics that can be determined at a specific place with some sophisticated laboratory methods that cannot be applied generally. And it is even more worrying that the lower boundaries of chronostratigraphic units keep changing in time (an example is the highly important P/T-boundary)! This makes an overwhelming amount of previous studies, for instance in the field of paleodiversity, almost worthless, if not worthless at all. It is, in my opinion, a shortcoming of all organizations and persons involved that these aspects

have not been well communicated with the geoscience community. Admittedly, presentations have been given and literature has been published, but not in media that are read by (almost) the entire earth-science community, at least not in a form that answers all the above (and many more) questions.

It will be clear from the above that I am not convinced of the need for this new chronostratigraphy. But if authorities decide, the individuals have just to obey. The new chronostratigraphy should be implied, indeed, and this book presents the most up-to-date, international standard, as ratified by the International Commission on Stratigraphy and the International Union of Geological Sciences. It is therefore an essential reference for all geoscientists, researchers, applied geologists and students alike.

For the purpose of correct usage of the new chronostratigraphy, the book presents the standardized definitions of the geologic stages as approved by the International Commission on Stratigraphy and correlates these to regional stages. This is illustrated in colour throughout with plate-reconstruction maps, detailed time-scale charts, stratigraphic profiles and photographs for each of the geological periods. The book also presents an overview of the methods used to create the time scale so that readers can get an appreciation of resolution and accuracy issues. Finally, it includes a handy, detachable laminated card of the summary time-scale chart.

This all should have made this book a handsome tool, but in practice I think that the Elsevier wallchart (Haq, 2007) is much easier to use in practice. The fact that the Haq wallchart is not entirely up-to-date is, in my opinion, nor really relevant, as changes in the chronostratigraphy will go on for some time, as clearly indicated in the book. Moreover, the book is not consistent: according to Figure 2.4, the Eoarchean starts 4.6 Ga ago, whereas it starts 4 Ga ago according to Figure 3.2. This implies that the reader is left in confusion, not only about what data are correct, but also about the question whether this whole revision of Earth's chronostratigraphy has been carried out with sufficient accuracy. The book raises more questions. It is stated

(p. 26) that "A stratigraphic chart ... should be based on an existing rock record". This is certainly not true for a chronostratigraphic chart (as many definitions of boundaries indicate), and it cannot be true either (what about the Hadean rocks?). There are other shortcomings; for instance, the Cryogenian "will be defined to contain the main global ice ages of the Neoproterozoic" (p. 32), while the mere existence of a 'Snowball Earth' theory is subject to hot debates. It is also annoying that the authors do not always adhere to SI and derived units, but use (fortunately rarely) units such as 'myr' where 'Ma' would be correct.

Perhaps fundamentally more problematic is that the authors leave choices. There is, for instance, a Triassic time scale (p. 100–101), but also an "alternate Triassic timescale" (p. 102). In other cases, it is not mentioned that there is a choice: the Tertiary is still a name that is allowed to use, but this is not mentioned. And I think that it is amazing that authors of a book on such an important topic as Earth's chronostratigraphy refer frequently to Wikipedia as a source for further information. Wikipedia has proven too frequently to be manipulated and to provide incorrect information. I cannot imagine that the authors have any argument for such references.

Taking all together, I think that the book contains a wealth of interesting information, but neither this 'summary' nor the large 2004 book should be considered as the 'ultimate bible'. There will probably follow more such books in the course of further refining of Earth's chronostratigraphy, and it may be worthwhile to wait for the 'ultimate' publication. But the small laminated card with the timescale is a tool that can easily be taken into the field, and that makes much of the rest of the book superfluous.

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