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Comment

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The authors are to be congratulated for their deep appreciation of Jeffreys's famous book, *Theory of Probability*, and their very impressive, knowledgeable consideration of its contents, chapter by chapter. Many will benefit from their analyses of topics in Jeffreys's book. As they state in their abstract, "Our major aim here is to help modern readers in navigating this difficult text and in concentrating on passages that are still relevant today." From what follows, it might have been more accurate to use the phrase, "modern well-informed Bayesian statisticians" rather than "modern readers" since the authors' discussions assume a rather advanced knowledge of modern Bayesian statistics. Readers who are "just" physicists, chemists, philosophers of science, economists, etc., may have great difficulty in understanding the authors' guide to Jeffreys's book. This is unfortunate since the book provides methods and philosophical principles relevant for all the sciences. Perhaps in the future, additional reviews of Jeffreys's book will be prepared that are understandable to a broader range of readers, as was done in having scientists and scholars from many fields discuss at length Jeffreys's and others' thoughts on simplicity and complexity at a conference and reported in Zellner, Kuezenkamp and McAleer (2001).

Another point that affects the authors' discussion is their apparent misinterpretation of the title of Jeffreys's book. They write, "The title itself is misleading in that there is no exposition of the mathematical bases of probability theory in the sense of Billingsley (1986) and Feller (1997)." In this regard, years ago Lord Rutherford, a famous physical scientist, said that if you need statistics to analyze your data, you better redesign your experiment, and as a result the word "statistics" was not highly regarded in the physical sciences and the term "probability theory" was employed by Jeffreys, Jaynes (2003) and many other physical scientists to include applied and theoretical statistics, mathematical methods, including elements of formal probability theory and philosophical aspects of science. With their narrow interpretation of Jeffreys's title, the authors found many discussions in the book to be "irrelevant," whereas Jeffreys considered them to be of fundamental importance and did not want to have his book limited to just mathematical topics, as in his and his wife's very famous book, *Mathematical Methods of Physics*. And indeed, Good [(1980), page 32] wrote, "In summary, Jeffreys's pioneering work on neo-Bayesian methods... was stimulated by his interest in philosophy, mathematics, and physics, and has had a large permanent influence on statistical logic and techniques. In my review Good (1962) I said that Jeffreys's book on probability "is of greater importance for the philosophy of science, and obviously of greater immediate practical importance, than nearly all the books on probability written by professional philosophers lumped together." I believe this is still true, though more professional philosophers have woken up."

With respect to the discussion of Chapter 1, readers will wonder what the authors mean by terms like "subjective," "objective," "objective priors" and "genuine prior information." Contrary to what the authors state, Jeffreys did adjust his "objective priors" (1) to get a "reasonable" amount of invariance, (2) to get "reasonable" results in the Laplace rule of succession, binomial problem and (3) to correct for "selection results" in testing many alternative models with large sets of data. Thus he was not always an "objective" Bayesian but rather a very thoughtful Bayesian who recognized needs for better procedures for certain problems and provided them in many cases. Perhaps he should be called a "pragmatic" Bayesian.

Most important in Chapter 1 is Jeffreys's axiom system for learning from data and experience that is applicable to research in all fields of science. He considered deduction and induction at great length in a most interesting productive manner and the authors provide interesting and useful comments. However, the authors' introduction of decision theoretic considerations as a solution in discussion of point 1 fails to recognize that the decision theoretic solution based on limited data, though "optimal" may not be very good

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