The reprinting contains a foreword by the President of the Carnegie Institution and an interesting introduction by William Rubey.

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The Earth, Its Origin, History and Physical Constitution, Fifth Edition, by Sir Harold Jeffreys, Cambridge University Press, 1970. xii + 525 pp. $22.50 in the U.S.A.

The fifth edition of the treatise which did so much to shape modern solid Earth geophysics as a coherent science is a matter of more than usual interest. This edition supersedes the fourth edition which was last reprinted (with additions) in 1962. Although the form and contents of most chapters and appendices remains substantially the same, the "Notes" have been reduced and many points incorporated in the text. As well, significant new material has been added to a number of chapters, increasing the length of the book by some 87 pages.

Among the additional material one finds an explanation of the latest revision of the constants of the Solar System, a discussion of eigenvibrations of the Earth, treatment of Rayleigh's principle in a form needed to give small adjustments to an Earth model (a much-used geophysical technique in recent years, thanks to Jeffreys), a summary of seismic evidence for deviations from perfect elasticity with depth in the Earth, as well as for regional differences in times of travel of seismic waves. A most useful discussion of the discrepancies from hydrostatic conditions in the Earth as inferred from perturbations of satellite orbits is included.

Undoubtedly, the additions with most bite are concerned with the working through, in Professor Jeffreys' brilliant way, of the consequences of a particular model for elastic imperfection in the Earth. The model called by Jeffreys "the modified Lomnitz law of creep," is based on a stress-strain relation with only 3 adjustable constants. First proposed as a fit to laboratory measurements on rock samples, it has been extrapolated over an enormous range of frequencies by Jeffreys—from periods of a few seconds for S waves to the 14-monthly nutation and lunar rotation. These extrapolations allow tests against diverse types of observations. Most of the reported tests provide verification of this form of elastic imperfection. Jeffreys goes on to argue forcefully that the model is "fatal" to present day convection and continental drift. These views must be taken as fighting words by the many geologists and geophysicists who have concluded that the recent evidence for sea-flow spreading, movement of lithospheric plates, and so on, is entirely convincing. Let us hope, at least, that there will be a direct quantitative response to the arguments of Jeffreys on this global problem. Certainly a substantial point of scientific method is involved. The flat disagreement is of the same scale as the classical controversy on the age of the Earth in which Kelvin was involved.

For the seismologist there are a number of new discussions including, as already mentioned, a section on terrestrial eigenvibrations (p. 291), some recent observational material on Love and Rayleigh waves (p. 96), a section (3.20) on recent work on core structure, and revised times (3.101) for P and S. In the latter, the work of Arnold and Gogna is emphasized (p. 120), although a mention is made, on page 491, of the 1968 travel-times for P and related phases constructed by Herrin and others; unfortunately, no detailed critique and comparison with the Jeffreys-Bullen times is given.

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"Borrego Mountain Earthquake of April 8, 1968," by T. Leslie Youd and Robert O. Castle, *Journal of the Soil Mechanics and Foundations Division, Proceedings of the American Society of Civil Engineers*, vol. 96, no. SM 4, July 1970.

This earthquake is of special importance for both geologists and engineers because of the unusually large and complex nature of the tectonic surface ruptures, and because of the possibil-

ity that ground shaking associated with this relatively small earthquake might have triggered small motions on distant faults. This paper by two U. S. Geological Survey investigators summarizes the effects of the earthquake on terrain and structures, with special emphasis on slope failures, shattered desert crusts, and seismic compaction.

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