Book Reviews

Stratigraphic Geology. Maurice Gignoux. Translated from the French ed. 4, 1950, by Gwendolyn G. Woodford. Freeman, San Francisco, 1955. xii + 682 pp. Illus. $9.50.

For those who are familiar with the French edition of this work, there need only be said this is an excellent translation. E. Hang's classic treatise appeared in 1918 and was already outdated in part when the first edition of M. Gignoux's work appeared in 1925. The fourth edition in 1950 gave a growth of 25 years during which considerable new geologic knowledge was discovered, and the fourth edition was justified. Following a short introduction where definitions, methods, and nomenclature are discussed, we find Chapter 1 on the Precambrian formations. Under Precambrian are summarized available information of the various areas, but the author says, "In spite of everything, this immense Precambrian period, in the present state of our knowledge, offers little of interest from the point of view of stratigraphic syntheses. . . . With the Cambrian, however, we shall enter the true domain of stratigraphic geology."

Then are taken up the Cambrian, the Silurian, the Devonian, the Permo-Carboniferous, the Triassic, the Jurassic, the Cretaceous, the Nummulitic or Paleocene, the Neogene, and the Quaternary. American geologists will miss the Ordovician, the Pennsylvanian, and the Mississippian and may dislike the use of the Nummulitic but the use is justified by the author. The general treatment in each chapter is a brief introduction and/or discussion of the fauna, then the various facies with the European and neighboring regions, then the North American facies. In the Permo-Carboniferous Gondiwana Land is examined; although Gignoux does not follow Wegener's ideas, he retains E. Argand's mobility and concludes that part with a comparison of the classic area (Europe) with the "calm and somnolence of immense Africa . . . our feverish Mediterranean is abnormal and it is in Africa that the normal history of a great continent is inscribed." The Nummulitic or Paleocene is the more familiar lower Tertiary (Eocene and Oligocene), and here the regions from the Paris Basin into North Africa are dealt with in some detail. The Neocene handles the Miocene and Pliocene with no discussion of the American deposits. The Quaternary is distinguished from the Tertiary by man and the Pleistocene glaciation. Here we get mammal remains and tools of man in the same deposits. We have tundra, steppe, and forest flora. We have Paleolithic and Neolithic tools, but the author does not consider areas much beyond the margins of glaciation. He closes with a quotation of Bergson, "l'univers est un machine à faire des dieux."

Here available in English is a volume that should be widely read in North America. It brings together an immense amount of valuable information with good, though small, maps, and correlation tables of area that too many of our students do not know. The references are numbered in each chapter but are not indexed, although the text is so handled. They would be better as footnotes but this is a very minor difficulty.

E. Willard Berry
Duke University

The Crime of Galileo. Giorgio de Santillana. University of Chicago Press, Chicago, Ill., 1955. xv + 338 pp. Illus. $5.75.

In this fascinating book, Giorgio de Santillana reexamines the historical documents relating to the trials and condemnation of Galileo and attempts to estimate the basic significance of the affair. He is well qualified to do so on many grounds, and the result, so far as the account of the actual course of events is concerned, is probably the most balanced and trustworthy now available. The assessment of significance, however, is more controversial. De Santillana draws a parallel between the Galileo case and the recent treatment of geneticists in the U.S.S.R. and of Oppenheimer in the United States. In all of these incidents he sees "the scientific mind as it has ever been—with its free-roaming curiosity, its unconventional interests, its detachment, its ancient and somewhat esoteric set of values . . . surprised by policy decisions dictated by 'Reasons of State' or what are judged to be such."

The suggestion is interesting and thought-provoking, but it seems to demand an undue simplification of the matter. There are three distinct aspects of the dispute between Galileo and the Inquisition: first, the issue as the protagonists saw it, the conscious motives that actuated them at the time; second, the ostensible reasons for the condemnation of Galileo, the evidence which was produced and on which the decision was given; and third, the significance of the whole incident in the wider context of human history, on which only those of later times who have experienced its consequences are in a position to pronounce. The outstanding value of de Santillana's book is its contribution to our knowledge of the second of these. No one who has not studied the documents is qualified to criticize his statements, but there is no reason to question their accuracy, and it appears abundantly clear that the case was decided largely on the evidence of false documents, contributing to "a plot of which the hierarchies themselves turned out to be the victims no less than Galileo."

The other two aspects of the case are, of course, of more permanent importance, and we cannot help feeling that in drawing his analogy with modern events de Santillana has not sufficiently distinguished those aspects. For although—to speak in the most general terms—the wider historical significance of the case relates to the conflict between the "scientist" on the one hand and religion or "Reasons of State" on the other, this was not the form in which it appeared at the time, when the distinction between the scientist and the religious philosopher had not arisen. There was but one question: What is the truth of the matter; does the earth move or not? and to that question biblical, ecclesiastical, and observational evidence was alike relevant. Where they appeared to clash it was not a matter of the "scientist" taking one side and the "authorities" the other. Each accepted all lines of evidence as equally valid, and the problem of how to reconcile them is represented in our day by that of reconciling the wave and particle theories of light rather than the biblical and evolutionary theories of the origin of species. On both sides were "scientists" and "theologians," and Galileo's letter to the Grand Duchess Christina, for instance, is not an acceptance of "science" and a rejection of "authority" but an assessment of the relative contributions of the two lines of evidence to the solution of the common problem. For this reason it is hard to see the justice of de Santillana's parallel.

The presentation is curiously complex in character. It is somewhat verbose and