

REVIEW

Le Cycle de L'eau: Climats, Paleoclimats et Geochimie Globale (in French) (The Water Cycle: Climates, Paleoclimates and Global Geochemistry); by YVES TARDY. P. 338, 134 figs., 59 tables. Paris, 1986 (Masson, 120 Blvd. St. Germain, 75280 Paris, 164 French francs).—"This book is an invitation to consider the climatic fluctuations of the present and the past as elements of global hydro-geodynamics and of planetary geochemistry. The water cycle is influenced simultaneously by the tectonic pulsations of the crustal plates, by the configuration of the oceans and continents, by the oscillations of composition of the ocean and of the atmosphere, by the cadence of photosynthetic activity, by the fluctuation in the discharges of streams, as well as by the rhythms of erosion and soil formation."¹

This 16 × 24 cm paperback is a most useful summary of a diverse literature on the controls of modern and paleo-climates, with the global water cycle performing as the unifying theme. The book is divided into two parts — 3 chapters (121 p.) on the present day Global Cycle of water and 4 chapters (166 p.) on Global Hydrodynamics.

Part One covers the mechanism and balance of heat exchange at the surface of the Earth; mechanism and balance of evaporation at the soil surface; hydrological budget of catchment areas and water balance of the world.

Part Two covers the global water cycle; characteristics of climates, local and global fluctuations, climatic cycles and crises; paleoclimates and cyclic evolution of climates throughout geologic time; global geochemistry and global hydrodynamics, with illustrative models.

Part One is pithy; full of tables, equations, graphs, and maps. It is a useful compilation from which to obtain answers to questions such as: "what are the values of albedo for various natural surfaces?," "how is solar energy received at the earth's surface affected by the clarity of the sky, and the height of the sun?," "what is the mean annual global distribution of sensible heat?," "how well do various equations describe the monthly variations of temperature at a given place at the earth's surface?." In general the material is understandable and useful without a knowledge of the calculus, although many of the equations have numerous terms. Part One can be considered as required background material for Part Two.

Part Two is an admirable synthesis of the diverse literature on paleoclimates and how they are reconstructed. Tardy first develops the global aspects of present-day climate controls, then discusses at length the techniques that have been used to reconstruct paleoclimates. A notable feature is his collection of changes of various parameters over the last 570 my — sulfur isotopes of evaporite deposits, estimated masses of evaporites, carbon isotopes of carbonate rocks, estimated masses of carbonate rocks, among many others. The uses of these variations with time in interpreting paleoclimates are explained.

¹ Excerpt translated from back cover.

The book has about 600 references, with good coverage of European and North American sources, and especially good coverage of French language references. It is worth buying for that reason alone.

Because of the numerous graphs and tables, a good deal of the book can be comprehended from captions alone by a person with a French dictionary and a minimal knowledge of the language.

Inevitably there are some errors typical of first editions, and some interpretations that are currently highly controversial. But overall Tardy shows a firm grasp of his material. An English edition would be well-received.

Yves Tardy is a Professor at the Louis Pasteur University in Strasbourg, France. He is well known internationally, especially for his researches on regional and global aspects of rock weathering.

ROBERT M. GARRELS