LEGOS, and RICHARD M. TEETER, Chevron Oil Field Research Company and Chevron Research Company, Richmond, California 94802.

On page 5880, column 2, line 15 should read: Pliocene age (Midway Sunset Field . . .).

In Scheme I, the second time the word Fraction appears the footnote reference should be *b*, not *c*.

On page 5887, column 2, the formula at the end of the fourth line up from the end of the Experimental Section should be $C_{24}H_{41}D$.

*Book Reviews**

Electrochemistry of Cleaner Environments. Edited by J. O'M. BOCKRIS (University of Pennsylvania). Plenum Press, New York and London. 1972. xiii + 296 pp. $22.50.

One of the most important and urgent problems facing our present world society is the alleviation of the pollution of air and water. Bockris cites the burning of fossil fuels in power plants and the internal combustion engine, as well as metallurgical practices (*e.g.*, reduction of copper by formation of oxide from sulfide thus releasing S and SO_2 into the atmosphere), releasing of dirty industrial liquids into streams, rivers, and seas, and the present treatment of sewage and rubbish as some of the causes for our present situation. The problem has developed to such an extent that it threatens public health, promises to influence the meterology of the planet, and requires revolutionary changes in the way of life of the inhabitants of the globe in order to accomplish a solution.

The object of the book is to illustrate a few specific ways in which a cleaner world may be realized by employing present and improved electrochemical technology.

The influence of the combustion of fossil fuels on the climate is reviewed by G. N. Plass (Texas A&M University). Emphasis is given to the role of CO_2 in influencing the climate of the earth. E. H. Hietbrink, J. McBreen, S. M. Selis, S. B. Tricklebank, and R. R. Witherspoon (General Motors Corp.) discuss electrochemical power sources for vehicle propulsion. They examine incentives for electric vehicles, obstacles to their development, and requirements of power sources. The crux of their chapter is devoted to a discussion of batteries and fuel cells. They conclude with a projection of the steps by which electric vehicle technology might evolve.

A. T. Kuhn (University of Salford) describes the electrochemical treatment of aqueous effluent streams. Four methods are examined including electrodialysis to remove ions, electroflotation to separate suspensions into slurries and clear liquid, electrodeposition of metals, and electrooxidation of unwanted organic compounds.

T. A. Henrie and R. E. Lindstrom (U. S. Bureau of Mines) describe the "Hydrometallurgical Treatment of Sulfide Ores for Elimination of SO_2 Emissions by Smelters" in an effort to suggest methods of reducing sulfide ores and avoid base-metal pyrometallurgical operations which pollute the atmosphere with sulfur oxide gases.

E. C. Potter (Commonwealth Scientific and Industrial Research Organization, Australia) discusses the electrofiltration of particulates from gases. The theory and practice of electrostatic precipitation are reviewed.

B. D. Epstein (Gulf General Atomic Co.) outlines electrochemical methods of air and water monitoring in his chapter on electrochemical methods of pollution analysis. The review includes the analysis of ozone, oxides of nitrogen, SO_2, and oxidizable sulfur contaminants, carbon monoxide, and fluorides in air, and the measurements of conductivity, pH, and oxidation reduction potentials in water monitoring.

The prospect of abundant energy is introduced by R. P. Hammond (Oak Ridge National Laboratory). The chapter explores the basis for future energy supplies and the possibilities for substantial reduction in cost. Hammond visualizes both fusion and fission reactors in large energy centers and agroindustrial centers to provide power, desalt water, and utilize land which is now marginal.

A unique solution to the general problem of energy production and pollution abatement is offered in the Hydrogen Economy by D. P. Gregory, D. Y. C. Ng, and G. M. Lang (Institute of Gas Technology). They show how hydrogen can be produced electrolytically and used as fuel producing only H_2O as a combustion product to complete a simple cycle. They consider the technology and economy of the nuclear-electrical future.

Bockris concludes that adequate research funding by national governments and increased education in electrochemistry will help to achieve a future of pollution-free technology.

Sigmund Jaffe, *California State University, Los Angeles*

The Nuclear Overhauser Effect—Chemical Applications. By JOSEPH H. NOGGLE (University of Delaware) and ROGER E. SCHIRNER (Eli Lilly and Co.). Academic Press, New York, N. Y. 1971. x + 259 pp. $14.50.

This book is an excellent one for the chemist wishing to learn the principles and uses of the nuclear Overhauser effect. In four chapters the authors lay out the theory of the phenomenon in a very clear and understandable way, without making great demands on the reader's mathematical skills. Two further chapters discuss experimental methods, and a final lengthy review chapter presents chemical applications which have been reported through 1970, illustrating and emphasizing the points of the preceding chapters.

It is assumed that the reader is familiar with the principles and practices of high resolution nmr. Rigor has in a few places been curtailed for the sake of clarity; however, the balance achieved makes this a highly readable book which should be extremely useful for students and for nmr practitioners.

Aksel A. Bothner-By, *Carnegie-Mellon Universtity*

Guide to Modern Methods of Instrumental Analysis. Edited by T. H. GOUW (Chevron Research Co.). Wiley-Interscience, New York, N.Y. 1972. x + 495 pp. $19.50.

This book attempts the impossible, succeeding fairly well. Twelve chapters discuss Gas Chromatography, High-Resolution Liquid Chromatography, Thin-Layer and Paper Chromatography, Gel Permeation Chromatography, Visible and Ultraviolet Spectroscopy, Infrared and Raman Spectroscopy, NMR Spectroscopy, ESR Spectroscopy, Gas Chromatography-Mass Spectrometry, Mass Spectrometry, Electroanalytical Methods, and Differential and Thermogravimetric Analysis. The chapters emphasize theory and instrumentation, but most provide good selections of references on applications. Some, notably that on thin layer chromatography, have application sections of inadequate scope.

The attempt to cover (on an advanced level, according to the preface) uv and visible spectroscopy on 33 pages—theory, instrumentation, application, and all—is brave indeed. The chapter does provide a good selection of references. Perhaps the editor would have done better omitting chapters like this and that on ir and Raman spectroscopy—given the space limitations, the authors were confronted with an insoluble problem. Nevertheless, D. L. Rabenstein is remarkably successful in discussing nmr spectroscopy on 47 pages.

In the opinion of this reviewer, the following chapters will be of the greatest utility to most of the readers: T. H. Gouw and R. E. Jentoft: High Resolution Liquid Chromatography; M. J. R. Cantow and J. F. Johnson: Gel Permeation Chromatography; R. A. Flath: Gas Chromatography–Mass Spectrometry; D. H. Smith: Mass Spectrometry; E. M. Barrall, II: Differential Thermal and Thermogravimetric Analysis. These chapters might well justify buying the book.

Walter Lwowski, *New Mexico State University*