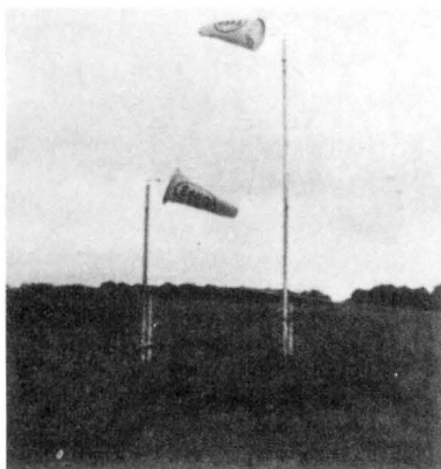


Contrary Currents



Demonstration of an effect of lee waves with wind socks. Diagrams showing how this occurs accompany the photograph, which is reproduced in *Clouds of the World: A Complete Colour Encyclopaedia*, by Richard Scorer (David and Charles, Devon; and Lothian Publishing Co., Melbourne, 1972).

considerable depth. On the other hand dye application receives more cursory treatment. Of some seventy pages devoted to this topic, forty-six cover general technical matters. The physical chemistry of dye application is the subject of a short highly abstract treatment which provides an inadequate introduction to a very extensive literature.

By intensive cross reference the book covers a great deal of ground in relatively few pages and this makes for highly concentrated reading. It is thus a more economical buy than its price suggests. It is a valuable addition to the literature and it should achieve the authors' objective of arousing greater interest in dye chemistry. There are few errors of translation although I-acid for J-acid is an obvious slip.

I. D. RATTEE

Electrochemistry

Electro-chemical Science. By J. O'M. Bockris and D. M. Drazic. Pp. viii + 300. (Taylor and Francis: London, September 1972.) £6.

THE resurgence of electrochemistry in the last twenty years has produced a vast number of texts on different aspects of electrode processes. Many of these have been of a very advanced and specialized nature, and the name of Professor Bockris—the senior author of the present book—has appeared on a substantial number of them either as author or editor. The book under review is a venture of quite a different type—an attempt to explain very

simply the fundamental ideas underlying processes at electrically charged interfaces, which the authors consider is the essence of electrochemical science, and to indicate the harvest of useful applications which may be expected to follow from its development.

This venture has succeeded magnificently, and the authors are to be congratulated on producing a book which is not only illuminating but exciting to read in its novelty and freshness. Some of their conclusions are quite unconventional. It is with some sense of shock and even a feeling of irreverence that one reads "As a result of Nernst's influence, electrochemical science in practice is half a century behind the progress it might possibly otherwise have made". However, the authors make out a good supporting case in the emphasis which Nernst's work gave to the thermodynamic treatment of electrochemical cells at equilibrium, whereas in practice a working electrode when electrolysis is occurring is rarely in this convenient state, and it is the kinetics of the processes occurring which are all-important. Throughout the book the ideas are developed always in the context of their present or future application in technology, and the variety and novelty of the applications considered are constantly entertaining. A very optimistic view is taken of an electrochemical future in which electrochemical science partners nuclear power in providing a world free from dependence on fossil fuels and with a cleaner environment. An example of how electrochemical science will alleviate pollution is the removal of discarded motor cars. They are to be dissolved in an ionic bath electrochemically, and the dissolved metals are then to be recovered separately by deposition with potentiostatic control of the cathode potential.

The main development of ideas in the book starts with a consideration of the structure of the electric double layer in an interphase, and why the potential difference across it can affect electrochemical reaction rates so greatly. This touches on many difficult fundamental points and clarifies them, and even experienced electrochemists can read it with advantage. The charge transfer across the layer is dealt with by the conventional energy barrier method leading to the concept of overpotential and its relation to current density; some indication of the quantum mechanical nature of electrode reactions is given. Transport processes and their great influence on electrode reactions in practice are dealt with in an admirably realistic way. These ideas are then used in the interpretation of the characteristics and problems of electrosynthesis, metal deposition, fuel cells, storage batteries,

corrosion, and electrobiochemistry. The book is well printed, indexed, and illustrated, and it should be regarded as essential reading for any student or teacher of electrochemistry.

A. HICKLING

Determining Defects

The Electronic Structure of Point Defects as Determined by Mössbauer Spectroscopy and Spin Resonance. By G. K. Wertheim, A. Hausmann and W. Sander. Pp. x + 222. (North Holland: Amsterdam and London, 1971.) Hfl. 62; \$20.25.

THIS is a curiously disappointing book, certainly lacking the distinguished treatment so obvious in earlier volumes of the North Holland Series on "Defects in Crystalline Solids". Nevertheless, it contains a modicum of useful information. A basic fault is that the book hardly lives up to its title, since it is concerned mainly to identify defects rather than to discuss their electronic structure. Furthermore, the authors do not clearly differentiate between impurities and lattice defects, the treatment of the latter being scanty indeed.

Part I (Wertheim) is an extensive and readable account of Mössbauer studies: here the emphasis on impurities is greatest, perhaps understandably so. A very wide range of materials is discussed, as are such phenomena as order-disorder transformations and precipitation in various alloys. Part II (Hausmann and Sander) is devoted to the application of paramagnetic resonance methods to structural defects. The basic principles of electron spin resonance and electron nuclear double resonance (ENDOR) are outlined clearly and concisely. The level of treatment of the various types of solids investigated varies widely. Colour centres in the alkali halides are treated rather superficially. The authors go little further than 1962 in discussing colour centre spectroscopy in the alkaline earth oxides, despite a considerable body of research being published in the last decade. Rather more detailed treatment is given to the current situation in semiconducting crystals, although the heavy bias towards impurity effects is continued.

For the most part, the book is readily understandable, but it would be hard to obtain a full account of the existing experimental situation from reading it. The editors and authors would have been well advised to have used a somewhat different title and to have made an effort to produce a more integrated format. No doubt the cost allied to the rather dated information reviewed will result in this book being found mainly on the shelves of the wealthier reference libraries.

B. HENDERSON