

light scattering of photochemically produced aerosols.

The remaining thirteen papers in the third part of the book form a detailed discussion of the Pasadena Smog Study—a major investigation of Los Angeles smog carried out at the California Institute of Technology in 1969. Here there are papers describing the project, the data collection and aerosol analysing systems used, as well as the presentation of experimental data on aerosol size distributions and chemical compositions.

Factors such as climatology, meteorology, behaviour of trace gases and the mechanisms for particle-gas interaction are discussed in relation to their effect on the evolution of the Pasadena smog.

The book is clearly written and well presented, and has a useful subject index. It also lists the sixty-five names and addresses of the authors, and of these, fifty-one originate from the USA, nine from France, three from Germany and two from Canada.

I would expect to find this book widely read and used by all research workers in the field of aerosol science, and those interested in the subject of atmospheric chemistry with particular reference to air pollution.

It should be mentioned, however, that the book is an adaptation and reprint of the *Journal of Colloid and Interface Science*, 39 (1972).

ALAN B. HEDLEY

Electrostatics

Electrostatics and Its Applications. Edited by A. D. Moore. Pp. xviii+181. (Interscience: New York and London, May 1973.) £12.50.

THIS book, written by eighteen contributors, is intended to be a unified and complete survey of modern electrostatics, but it is not clear at whom it is aimed. The quality of the writing varies considerably, and the language is often woolly and obscure. Perhaps it is meant as a eulogy on electrostatics: the editor claims that without it the USA might have been part of the British Empire!

SI units are used mainly but not exclusively. The mixing of symbols for quantities and for units in equations can be confusing, like

$$V = \frac{Q}{C} V$$

There are no problems and only one worked example. On the credit side, most chapters begin with a helpful "overview". There are copious references, and most of the diagrams are clear.

The first four chapters give the basic concepts. These are presented in a confused fashion, and the lack of rigour hinders understanding. A few examples

from the many misleading and incorrect statements follow. It is said that if electrons are removed from atoms or molecules, positive ions or anions are formed, and anions move to the anode. The transfer of charge in a Van de Graaff generator is described, and then the statement is made that many examples of "convective charge transport" are found in other devices. The text in one case says that the velocity of accelerated particles depends on the square root of the charge, and then gives an equation showing (incorrectly) that it depends linearly on the charge. In the section on photoelectric charging it is said that "free electrons are not easily ejected from a surface because of the relative impossibility of satisfying both energy and momentum conservation conditions". Cross hatching is referred to in a figure which has no cross hatching. Mention is made of the "coupling between electrical forces and Newton's second law".

Chapter 5 is better. It gives a straightforward presentation of the theory of dielectrics, and considerable information on surface charges for a variety of materials. The practical problem of obtaining reproducible results is emphasized. Chapters 6 to 8 deal with long-lasting electrical effects, electrostatic motors, and electrostatic generators. Some interesting information is presented, but considerable space is given to historical descriptions at the expense of modern developments. The language is sometimes vague and even misleading. For a book published in 1973, it is astonishing that no mention is made of the contribution made by Ray Herb to electrostatic generators.

The remainder of the book deals mainly with the industrial applications of electrostatics, and the standard is generally businesslike. Chapter 9 deals with electrostatic precipitation, presents the relevant theory and gives a good deal of practical information. Chapter 10, on the electrostatic separation of solids, is mainly descriptive and at a fairly elementary level. The methods and equipment used in electrostatic coating, for painting, sandpaper manufacture, and so on, are described in chapter 11, and chapter 12 does the same job for electrostatic imaging. Chapter 13 covers the principles and elementary theory of impact printing, and discusses various practical systems.

Two of the most interesting chapters to me, perhaps because of my total lack of familiarity with the subject, deal with non-uniform field effects. A rather fundamental approach is adopted to this topic of dielectrophoresis, and then its application to biological materials (for example the separation of living yeast cells from dead ones) is discussed. Rather disappointing chapters on electrostatics in

the power industry and atmospheric electrostatics are followed by electrostatic nuisances and hazards, and a chapter on miscellaneous effects and applications, from electrostatically operated display signs to the effects of ions and electric fields on living organisms. The final chapter, by the eminent Professor Felici of Grenoble, reviews the blessings brought to us by electrostatics. He concludes his chapter and the book with the magnificent sentence, "Then applied electrostatics will reveal itself as a gentle, protective, and benevolent science, best suited to reconcile man with his environment and to help him along through the trials he is sure to face in the future".

It is an excellent idea to cover the theory and applications of electrostatics in one volume. This makes the disappointment all the greater that the treatment is so uneven.

R. G. P. VOSS

Nearshore Phenomena

Waves on Beaches and the Resulting Sediment Transport. Edited by R. E. Meyer. (Proceedings of an advanced Seminar conducted by the Mathematics Research Center, University of Wisconsin, and the Coastal Engineering Research Centre, US Army, at Madison, October 1971.) Pp. vi+462. (Academic: New York and London, October 1972.) \$16.

THE basic concept behind this volume is excellent: there is undoubtedly a need for a comprehensive review of the new ideas that have produced major advances in the understanding of nearshore phenomena in the last decade. This book therefore provides a welcome reference point for the modern work in this field. Unfortunately the compendium format has severe disadvantages when one is trying to present a balanced, interdisciplinary view of the state of any subject. Here, the fact that this is a collection of individual contributions is further emphasized by the lack of any obvious logic in the arrangement of the chapters. The general approach is inevitably uneven, some chapters concentrating on general reviews of a topic, some describing very specific pieces of research. The general level is therefore hard to assess; certainly the geologist or geographer interested in beaches will find the mathematical treatment rather formidable. The casual reader may have difficulty in appreciating the interrelation of the concepts presented in the separate chapters.

However, the more advanced student will certainly find this volume very useful. The chapters on wave recording, basic equations, wave caustics, run-up, wave breaking and longshore currents provide a general background for the