Mechanics of Polymers. By R. G. C. Arridge. Pp. ix+246. (Clarendon : Oxford; Oxford University : London, June 1975.) £6.50.

Books on the mechanical properties of polymers range between two extremes: the practical approach is to present large quantities of data held together with theoretical interludes, whereas the pure approach is to stick mainly to theory and only introduce data occasionally.

This book is predominantly of the second sort. There is a thorough discussion of elasticity theory, including large strain elasticity and anisotropy, and a chapter on time-dependent elasticity theory, but these are left hanging as the chapter on applications to polymers discusses mainly transition temperatures and test methods.

The treatments of anisotropy and of yield and fracture are more integrated, although there are relatively few examples. The discussion of fracture is very short.

This book is too uneven to be a good general text, although individual chapters may prove valuable. Most of the material is also in Ward's *Mechanical Properties of Solid Polymers* (1971). An understanding of vectors and tensors is required. Most of the time SI units are used. Some of the diagrams, particularly of chemical structures, are unclear.

P. D. Calvert

Applications of High-speed Liquid Chromatography. By J. N. Done, J. H. Knox and J. Loheac. Pp. vii+238. (Wiley-Interscience: London and New York, January 1975.) £6.50.

THE technique of high speed, high pressure, liquid chromatography (HPLC) is one of the more rapidly expanding areas of analytical chemistry: it now rivals gas chromatography in terms of practical importance. The primary advantage of the method is that it can separate compounds which are not readily amenable to gas chromatography; for example, polymers, high molecular weight compounds, and ionic and strongly polar species such as steroids and sugars, and so on.

In the modern analytical laboratory any decision to invest in a new technique is often dependent on an assurance that it can solve a specific problem. This book aims to assist in this decision and also to provide a much needed practical guide to the field.

After a brief but effective coverage of the technique and theory of high speed liquid chromatography the major section of the book consists of examples of selected chromatograms taken from the recent literature. The 150 examples

shown illustrate the wide range of compound types amenable to HPLC and cover hydrocarbons and petroleum, acids, amines and nitrogen compounds, phenols and antioxidants, sulphonic acids and dyestuffs, insecticides and herbicides, nucleotides and nucleic acid bases, pharmaceuticals, steroids and natural products. Each chromatogram includes details of column material, column length, packing and particle size, operating temperature, pressure type of detection and sensitivity.

As the authors correctly point out, the rapid advances in this field will lead to improvement in some of the chromatograms but the operating conditions will not undergo any radical changes.

Altogether this is an excellent book, concise and well documented and providing the essential information for anyone contemplating the use of this important technique.

B. Fleet

Books brief

Compaction of Coarse-grained Sediments, (Developments in Sedimentology 18A.) Edited by George V. Chilingarian and Karl H. Wolf. Pp. 552. (Elsevier Scientific : Amsterdam, Oxford and New York, 1975.) Dfl. 130; \$54.25.

THIS latest contribution to the series *Developments in Sedimentology* is the first of a two-volume appraisal of compaction of coarse-grained sediments, and complements an earlier volume dealing similarly with argillaceous sediments. For such a highly specialised subject, embracing so many disciplines, the editors have succeeded in assembling a balanced collection of well presented and illustrated papers which should largely satisfy geologists and engineers working in this field. Most of the chapters are essentially of a review nature and contain comprehensive bibliographies; as such, the book should serve as an invaluable source of reference.

Of specific interest to geomechanics are chapters dealing with experimentation and mechanics of sand compaction (Allen and Chilingarian), its effects on such properties as sediment porosity, permeability, strength and so on (Ingles and Grant), and a detailed presentation of mathematical models illustrating problems arising from the compaction of porous solids (Raghavan and Miller).

Sedimentologists are catered for in papers dealing with compaction of carbonate sands (Coogan and Manus), a case study demonstrating how

differential sand-mud compaction can determine the geometry and distribution of elongate sandstone bodies (Brown) and the use of geophysical well logs in recognising depositional environments and sediment compaction (Allen). Bissell and Chilingarian review the magnitude and possible causes of hypersubsidence in various sedimentary basins in North America as well as reporting on localised subsidence related to oil and water extraction.

The second part is eagerly awaited.

Brian Waugh

Chemical Oceanography. Edited by J. P. Riley and G. Skirrow. Volume 1. Pp. xx+606. £18.50; \$49.00. Volume 2. Pp. xx+647. £19.50; \$51.50. (Academic : London and New York, June 1975.)

THIS edition up-dates the previous one of about a decade ago and these volumes benefit from more quantitative descriptions of marine chemical phenomena. Refreshingly, an attempt has been made to standardise units of measurement throughout these volumes. Most of the chapters contain a complete range from basic theory to modern applications in the field. An excellent example is the chapter on seawater as an electrolytic solution, in which well-developed arguments are used to explain its complex electrolytic nature. The overview that this and some other chapters present is the most significant improvement on the earlier edition—frequently a catalogue of random measurements of chemical species.

The impression that chemical oceanography lags some way behind other fields of science is dispelled by many of the chapters. Others only confirm this impression—for example, the essay on micronutrient elements comprises much work completed twenty years and more ago. The chapter on dissolved organic material in seawater confirmed the unsatisfactory state of research in this area. The all-embracing expression 'dissolved organic matter (DOM)' appeared too often and is of limited usefulness. The inclusion of DDT and PCB seemed out of place, and I was not convinced as to the accuracy or completeness of the information presented on chlorinated hydrocarbons.

The opportunities for criticism in these volumes were few. The books taken as a whole provide a comprehensive picture of chemical oceanography today. To anyone interested in the marine environment I warmly recommend this major work.

M. M. Rhead