Inflammatory Substances

Chemical Mediators of the Acute Inflammatory Reaction. By M. Rocha Silva and J. G. Leme. In collaboration with Hanna A. Rothschild. Pp. ix+263. (Pergamon: Oxford and New York, December 1972.) £6.

FELDBERG and his colleagues in the 1930s established histamine as a chemical mediator of inflammation. Since then, other possible components of the inflammatory response have been found, including 5-hydroxytryptamine, slow reacting substance in anaphylaxis (SRS-A), bradykinin, various chemotactic factors, rabbit aorta contracting substance (RCS) and prostaglandins of the E and F series. Each substance, as its involvement is proposed or demonstrated, has been regarded as the most important inflammatory mediator, only to be supplanted after a few years by the latest pharmacological fashion.

During the past few years we have passed from the bradykinin phase into the prostaglandin phase of inflammation, but this change of emphasis is not reflected in this book; perhaps partly because bradykinin was discovered and named by one of the authors, but mainly because there must have been an inordinate delay between writing the manuscript and eventual publication. This is sad, for in such a fast-moving field, as inflammation, it means the book is already out of date. For example, of more than 400 papers which the authors cite in the main chapter on chemical mediators, only forty-six were published in the last four years and sixteen of these came from their own laboratory. Thus, little cognizance is taken of work published since 1968 by Solomon and Juhlin, Kaley and Weiner, Crunkhorn and Willis, Spector and Willoughby, Greaves and his colleagues and Änggard and Jonsson, involving prostaglandins in the inflammatory response and that published in June 1971 from my laboratory, demonstrating that inhibition of prostaglandin biosynthesis may be the fundamental mechanism of action of aspirin and similar anti-inflammatory drugs.

The book consists of four chapters, each one of which is well written, fluent and lucid. The first deals with the history of the inflammatory reaction. The second describes methods of measurement of the inflammatory response and concentrates on techniques which quantitate vascular leakage by extravasation of dyes or carbon particles. It would have been useful if these methods could have been compared with the ones using extravasation of labelled large molecules as a quantitative method. Co-axial perfusion of tissue spaces as a means of collecting potential mediators of inflammation is also given considerable space, but the important work of Lewis and his colleagues, who measure enzymes and other chemicals in the lymph draining an injured site, is not recounted.

The third and largest chapter concerns the chemical mediators and quite naturally devotes considerable space to arguing the case for the participation of bradykinin. The last chapter deals with the anti-inflammatory drugs and demonstrates well the difficulties encountered in proposing a mechanism of action for these substances before it was discovered that they prevented formation of prostaglandins.

The book, then, is a useful reference source for those interested in reading about the history of chemical mediation of inflammation up to 1968. Work published since then is not adequately reviewed.

J. R. VANE

Sound in Hologram

An Introduction to Acoustical Holography. By B. P. Hildebrand and B. B. Brenden. Pp. xii+224. (Adam Hilger: London, August, 1972.) £7.

THE purpose of this book, as stated in its preface, is an admirable one, namely, "To bring together the results of research in acoustical holography so that workers in non-destructive testing, medical imaging, underwater imaging, and seismic exploration can decide whether this new technique can be useful to them". The wave of interest which followed the publication in 1966 of the first papers on this subject brought with it not a few misunderstandings and fanciful claims concerning the results which were thought by some to be possible. An authoritative review of this kind is therefore to be welcomed. The text of the book is clear and concise, useful lists of references are included for further reading and there are more than eighty illustrations of actual holograms and reconstructed images, some of them published here for the first time, which have been obtained by the various methods described.

A short introductory chapter shows how the original Gabor concept of holography led to the Leith–Upatnieks system, in which the directions of the interfering beams are chosen to facilitate the suppression of the unwanted image. Chapter 2 gives the basic theoretical analysis of holography including the replacement of the reference beam by an electronic reference. Chapter 3 is devoted to a brief summary of the theory of the propagation of acoustic waves in liquids and solids, refraction, reflexion, radiation pressure and so on. There follows a detailed analysis of various ways in which a hologram can be built up by, for example, using a moving point receiver to scan the field by measuring the phase and amplitude at each position and then using the signal to modulate a synchronously-scanned light source over a photographic film. The analysis includes the calculation of the angular resolution of scanned holograms and of the aberrations occurring at high scanning velocities. The use of time gating, as an additional means of rejecting unwanted data from particular regions of object space, is also mentioned. There is a chapter on the application of information theory to sampled holograms and results obtained with a circularly-scanned system are used to illustrate the conclusions reached. The theory of the interaction of sound and light at a liquid surface is described and applied to an important direct method of hologram formation. Other methods, such as the use of thermoplastic film as a detector and the optical heterodyne technique, are briefly described. Finally, some applications of acoustical holography are described. These range from well-established fields such as medical diagnostics and non-destructive testing to more tentative proposals relating to underwater acoustics and seismic exploration.

V. G. WELSBY

Crystal Spectra

Infrared and Raman Selection Rules for Molecular and Lattice Vibrations: The Correlation Method. By William G. Fateley, Francis R. Dollish, Neil T. McDevitt and Freeman F. Bentley. Pp. 222. (Wiley: New York and London, November 1972.) £5.45.

IN recent years there has been increasing interest in the analysis of the vibrational (infrared and Raman) spectra of crystals. This has been something of a "no man's land" between the normal territories of the spectroscopist and the crystallographer with, for the former, unusual notations and pitfalls to be overcome. Although the most direct approach to the analysis of crystal spectra—the correlation method—was developed more than twenty years ago by Hornig and Halford and their coworkers, the results of this method have not been systematically tabulated, with the result that a number of misunderstandings have led to mistakes in the literature. The aim of this short book is to present systematically the tabulated data and to apply these in detail to a sufficient number of examples to make clear the correct way of using the method and its scope. This is well and clearly done. The only criticism of the book is that it is very much a spectroscopist's publication dominated by the Schoenflies point group notation with which the reader is expected to be fully familiar. As crystallographers are