chapters on myometrial anatomy, histology and histochemistry, and physiology; the process of labor, the puerperium, and lactation; and a final one on maternal physiological adjustments to pregnancy.

Although the material in each of these scholarly monographs is technical enough to provide source material for other investigators, the clinical orientation can be seen from the contents so briefly noted above. This book, and its announced companion volume 2 on the physiological and biochemical aspects of the fetus and newborn, can go a long way toward moving the whole specialty into the new era in obstetrics of which these young scientists cum practicing obstetricians and their like-minded colleagues are examples.

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Defects in Solids

Calculation of the Properties of Vacancies and Interstitials. Proceedings of a conference, Shenandoah National Park, Va., May 1966. U.S. Department of Commerce, Washington, D.C., 1967 (available from Superintendent of Documents, Washington, D.C.). viii + 202 pp., illus. $2.50. National Bureau of Standards Miscellaneous Publication No. 287.

Many of the properties of solids are controlled by defects within them. Point defects such as vacant lattice sites, impurity atoms, and interstitial atoms give rise to such diverse phenomena as electrical conductivity in semiconductors, color of ionic crystals, and changes in the strength of metals. This fact was recognized a half a century ago, and careful theoretical consideration of these properties has been in progress since then, with the present conference describing the state of the art. Because of the exceeding difficulty of the problems, the progress has been slow, and, although new techniques are continually being proposed, one rarely sees a major breakthrough. Usually one starts with two-body interatomic potentials, since more accurate ones cannot be dealt with at the present time, and sums the energies of the interactions of an extra, foreign, or missing atom with all the other atoms in a crystal, and the energies of the interactions of the atoms in their distorted positions with each other. However, an interatomic potential must first either be calculated from first principles or be obtained by empirical matching to experimental data. Either technique encounters difficulties, since the electronic environment of a defect in a crystal is different from that assumed in either the calculated or the empirical potential, and the situation becomes even worse for small defect clusters where the symmetry may differ from that of the lattice. But even having an acceptable potential, one is still faced with the formidable problem of calculating the sums of interactions with the other atoms in the lattice when the defect has caused distortion of the position of the atoms and, in nonmetals, distortion of the charge distribution. Hence, calculations either of equilibrium positions or of a series of positions occupied during migration of the defect necessitate iterative computations of successive relaxations of neighboring atoms and the effect of these relaxations on their neighbors, and so on. Thirty years ago Mott and Littleton made such a computation for some alkali halides by dividing the crystal into a local region around the defect in which the distortions of positions of individual ions were considered, and the rest of the crystal, whose distortion was treated by elastic continuum theory. Today, with the advent of high-speed computers, many more individual relaxations may be included (up to about 600 atoms on the best available computers), but the problem must still be treated in the same way by matching this result to an elastic continuum. These methods are discussed in the present conference proceedings, with the conclusion that the results are reasonably satisfactory for vacancy-type defects but leave much to be desired for interstitial defects, which produce larger distortions.

Point defects in metals not only distort the position of atoms but also distort the electron configuration in their neighborhood and, hence, give rise to changes in such phenomena as electrical resistivity. Furthermore, the presence of defects causes alteration in the periodicity of mass points in the lattice and changes the normal modes of lattice vibration, which in turn alter the phonon spectrum of the crystal. Such changes affect the thermal and electrical conductivities. Theoretical calculations of the electronic and vibrational phenomena associated with point defects are also included in the conference proceedings.

The conference report is intended for the specialist, not the casual reader, and there is no attempt in the papers to educate the reader or even to define the jargon of the field. However, lengthy reports by study panels at the conference are included which review and summarize the three main areas of investigation: energies and configurations, electronic states, and vibrational states. These reports will be of great value to anyone who, having a background in solid state physics, wants to be brought quickly up to date (1966) in the field.

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Theory of Liquids

Liquid Metals. N. H. MARCH. Pergamon, New York, 1968. viii + 133 pp., illus. $7. International Series of Monographs in Natural Philosophy, vol. 15.

Although the foundations of a statistical theory of liquids were laid some years ago, the theory is still at a primitive stage of development. This is because of enormous mathematical complications arising out of the strong interactions between the atoms and out of their state of disorder. In liquid metals there is an additional complication because of the presence of "free" electrons. This mediation by the electrons brings about a radical change in the coulomb law of force between the ions. It is legitimate to say that we do not as yet know the precise form of this effective ion-ion interaction. Nevertheless, during recent years considerable progress, both theoretical and experimental, has been made in our understanding of the physics of liquid metals. In fact, a vast amount of literature has accumulated in this field. It is no mean task to summarize this knowledge in a monograph of some 125 pages. Judging purely from the amount of literature and the difficulty of the field, I am inclined to say that the author of the present work has done a reasonably good job.

There are in all nine chapters in this book. Chapters 1, 2, 4, and 5 are devoted to the static structure factor of a liquid and to a discussion of the method for calculating the interionic potential from a knowledge of the structure factor by using the three well-known statistical theories. March and his collaborators were the first to develop this