extensive and recent references given with some of the longer papers is a helpful feature. The editors warn in their preface that the conference, and hence by implication this book, was not intended to be educational in character. The book is intended as a tool for the active worker in the field. Although authoritative and up to date, some of the papers are rather esoteric and make hard reading—this is certainly not the book for the beginner.

The principal sections of the book cover electron channelling, atomic collision theory, radiation damage, sputtering, inelastic atomic collisions, ion channelling, electron excitation and photon emission, surface scattering of ions, and ion penetration profiles. There is a fair balance between presentation of theory and of experimental results. The sputtering of KI by exposure to ultraviolet radiation is interesting because of the support which the results lend to current theories of the mechanism of the formation of colour centres by irradiation of the alkali halides. The description of the direct observation of heavy ion collision cascades by field ion microscopy is very convincing. The papers on the channelling of electrons—important in the transmission electron microscopy of thin crystals—emphasize the need for a proper wave mechanical treatment of the interaction of the electron beam with the Bloch waves. There have been further refinements in the calculation of interaction potentials; Robinson has calculated these using the method of Firsov and starting from the simple scattering cross-section introduced by Lindhard. All in all, this book gives a picture of a flourishing and active field of study.

T. P. P. HALL

SPINS IN SOLIDS

Spin Temperature and Nuclear Magnetic Resonance in Solids

By Maurice Goldman. (International Series of Monographs on Physics.) Pp. ix+246. (Oxford University: London; Clarendon: Oxford, July 1970.) 85s.

THE aim of this book is to present a unified description of the high temperature approximation to spin temperature theory. Its chief application is to nuclear spin systems in solids. Although the treatment throughout is theoretical, appropriate experimental information is discussed whenever possible.

The concept of temperature in spin systems is introduced in the first chapter and modifications applicable to nuclear magnetic resonance are described. This chapter is followed by a study of the properties of nuclear spin systems which are isolated from the crystal lattice but subject to both sudden and adiabatic changes in the Hamiltonian. The effects on the spin temperature of a finite spin-lattice interaction are introduced. The two following chapters describe in detail the Provotorov theory of saturation which is applicable to cases when the probabilities of radio-frequency induced transitions are comparable with those for transitions induced by spin-lattice coupling. This theory is basic to much of nuclear magnetic resonance. The effects of spin-spin interactions on the spin temperature concept are then discussed. Finally, a description is given of dynamic polarization methods, which is particularly appropriate to the "solid effect" of thermal mixing in low fields. The appendix contains some of the more important results found useful in spin-temperature theory.

This monograph will be of value to both the experimentalist and theoretician interested in the properties of interacting spin systems and particularly to research workers in nuclear magnetic resonance. The material is presented in a clear and logical way and the subject matter is very carefully arranged and indexed. The text

may be regarded as complementary to the book by Professor A. Abragam on the *Principles of Nuclear Magnetism* (1961) and could prove an equally valuable addition to the literature of physics. C. A. BATES

FOR TRANSLATORS OF RUSSIAN

Russian-English Scientific and Technical Dictionary

By M. H. T. Alford and V. L. Alford. Vol. 1: Pp. xxvi+1-764. Vol. 2: Pp. 765-1422. (Pergamon: Oxford, London and New York, October 1970.) 240s; \$32.

ACCORDING to the dustjacket, this dictionary, containing "over 100,000 entries drawn from 94 different disciplines, technologies and other professional subjects", is specially intended for "people with weak or moderate knowledge of Russian grammar" and will be "invaluable to scientists learning the language". To facilitate its use by the latter, it is provided with a preliminary chapter, "Instructions for Learning Large Vocabularies", based on work carried out in the University of Essex and supported by the Office for Scientific and Technical Information, for developing new methods of learning to read foreign languages. New methods of vocabulary learning are presented, based on methods of identification of stimulus and remembering the stimulated response, and a procedure for learning large vocabularies by means of special prompt cards. Valuable as these methods may be to the language student, it is open to doubt whether this emphasis on those beginning Russian contributes much of value to this dictionary. A book of this size and price will surely be purchased chiefly by libraries, and by already competent translators of Russian wishing to extend and modernize their vocabularies, rather than by beginners, who would be more suited initially with one of the existing smaller dictionaries limited to their own field of study.

Used in practical translation, the potential use of this book is greatly decreased by this emphasis on the student. Some years back, L. M. Milne-Thompson, in his *Russian-English Mathematical Dictionary* (University of Wisconsin, 1962), introduced the practice of equipping each entry with a reference to the basic root of the word: "primechanie remark, note (met mark), prodolzhenie continuation, extension (dolg long)" which, although a valuable aid to learning, did not impede the fluent Russian speaker from using the dictionary. In this new work, however, each word is dissected into a complicated morpheme structure (prefix-root-suffix-inflexion) in which the elements are separated by raised points: *pri-mech-ani-e*, *pro-dolzheni-e*, which proves wearisome to the eye and considerably slows down the process of word-finding.

With regard to the content of the dictionary, it is, as claimed, extremely comprehensive (including such fringes of technology as "korset corset (garment)", "kosilka a mowing machine" and "mast colour of animal hair, suit at cards"). There are, however, a number of misprints, some of which (for example, "Lynds" for Lyrids) are not corrected in the errata. Russian versions of Latin-script proper names, (often a stumbling block) are given, though not always cross-referenced (thus the *Fabri-Pero* (Fabry and Perot) interferometer is listed under *Fabri*, but there is no cross-reference for Perot under *Pero*).

Apart from these (admittedly minor) defects, the vocabulary contained in this dictionary will be an invaluable aid to anybody regularly involved in the reading or translation of scientific papers in Russian. It is, however, somewhat too large and unwieldy a vocabulary for the beginner (even with the use of learning aids), and it is a pity therefore that the emphasis in format on the student (who will be less likely to use it) detracts from its undoubted value to those already proficient in the language.

VERA RICH