which a deficient error repair mechanism leads to a variety of defects including a high susceptibility to ultra-violet light and increasing numbers of skin tumours. Burnet sees this unpleasant syndrome, which has a known genetic basis, as a grossly accelerated example of ageing corresponding exactly to his hypothesis. In addition the belief he has about cancers arising as a consequence of somatic mutations is confirmed. To one who has read a number of Burnet's previous books much of the early parts of the present volume may evoke a strong sense of *déjà vu*.

As, with succeeding chapters, Burnet moves from Ageing in Mammals by way of the Genetics of Power to his Vision of a Million Years the book becomes more readable. Those who wish to dip into it should in my opinion start at the back and work forward until they come to familiar ground. The most evocative and fluent passages are those which concern Burnet himself. He talks wistfully of societies in which privileged elders can retain an honoured position as men of experience and transmitters of traditional wisdom. Despite or perhaps because of this he makes statements of astonishing lack of insight—for example, "a little thought will con-

vince most people that natural death means a death in which the essential factors concerned were genetic ones''. The value judgment involved here in the use of the adjective essential and the apparent lack of realisation of the operation of the many stochastic events which could influence the matter are surprising.

Whenever he himself has not thought about a particular matter it is dismissed in a lordly manner—for example, "we need not worry too hard to imagine by what mechanism it ('psychosomatic' death may be achieved.''

Few aspects of our contemporary society escape Burnet's pessimistic pen. Most of his views will be unpopular and one cannot help but agree with his statement that he has never failed to write, or modify what he has written, out of fear of the consequences. The book is erratic, aggravating, pontifical on occasions, sometimes clumsy, often obscure. but rarely dull. It should be read and discussed. □

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Atomic and molecular physics

Atoms and Molecules. By M. Weissbluth. Pp.713. (Academic: New York, San Francisco and London, 1978.) $59.50; £38.65.

GROWN out of a full year graduate lecture course in atomic and molecular physics, this monograph is both a textbook and a reference manual of ambitiously wide scope. Thus the final chapter (28) on ligand fields treats such topics as electronic d^3 in a cubic field with spin-orbit coupling. And the chapter's last section concludes with a diagram that shows the energy levels of molecular orbitals when an octahedral complex AB_6 is involved; from a preceeding table follows, for each symmetry associated with the levels, the structure of symmetry adapted orbitals for both the orbitals of the central atom A and the ligands B. It would be only a short step to frontier problems such as ferric ions in proteins. Derivations often take just a few lines—try this conclusively without simultaneously applying group theory to the central electrons and the lattice-like structure around them! All the required atomic and algebraic tools and data are lucidly expanded in the book, and referencing to them is done efficiently.

Naturally group theoretical topics take up most of the space in the first of the text's six parts, which gives the mathematical background. Only rigorous pruning to the needs of atomic and molecular physics, and resorting to summaries of selected properties where appropriate, keeps this part in size and readable. He who struggled through the thicket of the full representation theory of the permutation group, this centrepiece in problems involving identical particles, will appreciate the refreshing brevity and swiftness with which the relevant steps in Young's scheme evolve.

Part II, on the quantum-mechanical background, assumes some undergraduate course knowledge. The remaining four parts move on towards molecules: one-electron atoms (from Dirac's equation

by way of Schrödinger's to hyperfine interactions), N-electron atoms, electromagnetic interactions (culminating in the Kramers-Heisenberg formula and in applications), and finally 130 pages on molecules, covering in particular the spectra of polyatomic molecules. The notion of conjugate configuration, in the context of N-electron problems, tells immediately why no spin-orbit splitting occurs for half-filled shells. However, even then the mutual effect between electrons does give rise to some splitting. Such splitting may be ignored because of its smallness, though the author, in this rare instance, misses the cause when relating it to interaction solely between terms. All except purists are likely to overlook an unnecessary impediment to more fundamental approaches in some basic relationships: to equivalence a unit vector directly with its cartesian representation as a column matrix, and on occasion a state vector with the complete function—something quite commonly found in textbooks. Despite these shortcomings the whole presentation is elegant and informative.

This new book shares one weakness with many a first edition: the index doesn't measure up to the text. Similarly, the references haven't quite outgrown a list for the students' of recommended reading. There is one particular omission: among the three classics on group theory and quantum mechanics, which came out within a very short period around 1931, H. Weyl's and E. Wigner's books are mentioned, whereas B. L. van der Waerden's is not.

Who is going to buy the book? Sadly enough the price tag will turn away most graduate and postgraduate students. Needless to say that the book is well produced and the typographical layout excellent. But perhaps one should draw attention to over 70 useful tables, an impressive collection of information which, leaving aside the newly compiled tables, one might as well find scattered across several book-shelves.

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