derlying thinking. But when a professional translator, apparently without an adequate understanding of Piaget's theory, goes to work and renders the author's cumbersome French into well formed English sentences, the result, as seen in this book, can be truly disastrous. The very first pages are so full of translation errors that comprehension of Piaget's position on the basis of this introduction is out of the question.

For example, the translator does not stick to the same words in translating the original words: memory, remembrance, recognition, recall, which are definitely not interchangeable. 'Imprinting' is a technical term used by the translator where 'registration' would have been more appropriate. The French 'ou' can mean an equivalence (remembrance = conservation) or a disjunctive alternative (remembrance of schemes or of data): the translation does not clarify this ambiguity. In page 3 paragraph 3, "Habit . . . concerns that part of the memory we call recognition", is the translation given for Piaget's "habit . . . includes recognitory memory". Where Piaget carefully distinguishes operational (in contrast to pre-operational) and operative (in contrast to figurative) the translation generally renders both words as operational; similarly, Piaget's distinction between an operative scheme and a figurative schema is largely confused.

After the introduction the reporting of the investigation is less theoretical and the translation is no longer replete with serious and confusing errors. Piaget's writings are certainly a problem, admitted by him and all, quite apart from translation. I hate to think of anything like an 'official' translation, yet this translation is not only inadequate but totally confusing as regards a potential comprehension of Piaget's psychological theory. With this proviso I recommend to all persons interested in Piaget's theory this important addition to his work on cognitive functioning and its development.

H. Furth

Filling a nuclear gap

The Fundamental Particles. By B. H. Bransen, D. Evans and J. V. Major. Pp. vii+284. (Van Nostrand Reinhold: London and New York, September 1973.) £10.50.

The continuing expansion of nuclear physics research and the increasing adoption of short unit lecture courses in physics departments has led to the splitting of topics within nuclear physics. This is undoubtedly good practice and the physics of fundamental particles is an obvious unit choice. This book, aimed at the undergraduate student, is well written and presented and should serve its purpose as an introductory text. It contains a series of useful problems at the end of each chapter and is supplemented by some mathematical appendices on such topics as angular momentum, transition rates and the Weyl and Dirac equations.

After an introductory chapter, the authors concentrate for two chapters on the experimental methods of accelerating, transporting and detecting particles and measuring their masses and lifetimes. The treatment is selective but detailed. Then follow chapters on the conservation laws, symmetry principles and intrinsic quantum numbers. The pion-nucleon interaction is treated in detail using partial wave analysis. This chapter is very well put together. A chapter on mesons is followed by a discussion on the classification of particles including the quark model and the Regge classification. A description of high energy collisions follows. The authors conclude their book with chapters on electromagnetic properties and weak interactions.

The coverage is thus very extensive but the interest of the reader is well maintained throughout. The mathematics assumes some acquaintance with quantum mechanics. I find the book exceedingly readable. The introduction to each chapter is commendable. There is almost a complete absence of references in the text but a brief bibliography leads the reader onward.

This book adequately fills a gap between the simple and more advanced treaties on the subject, though its price is high.

P. R. Blake.

Astronomy updated

Astrophysical Quantities. By C. W. Allen. Third Edition. Pp. x+310. (Athlone), University of London. London. Distributed by Tiptree, Essex, November 1973.) £6.25.

The eagerly awaited third edition of Professor Allen's invaluable reference book proves to be slightly disappointing. As far as updating the previous edition is concerned, Allen has done a good job, but the sections devoted to topics which have grown up since the early 1960s are less satisfactory. The "entirely new sections" include plasmas, solar wind, solar XUV, pulsars, cosmic X-rays, quasars and Seyfert galaxies. But the pulsars section consists merely of half a page defining the variables relevant to the study of these objects and a table giving the parameters of only thirteen pulsars; even three years ago a much more useful compilation of pulsar data were provided by Maran and Modali (*Earth and Extraterrestrial Sciences*, **1**, 147; 1970), a source to which Allen does not even refer. It is a similar tale with the other new sections.

The virtue of previous editions has been that they covered just about everything, removing the need to hoard articles such as that of Maran and Modali. But it is a remarkable achievement for one man to have produced the original version of *Astrophysical Quantities*, let alone ensured that the latest edition is still invaluable almost 20 years after the original appeared.

In his preface, Professor Allen suggests that the time to begin work on the fourth edition is now and asks for offers of help with its presentation. I hope that some dedicated practitioner of the new astronomy will indeed be willing to collaborate with Professor Allen on the daunting task ahead.

John Gribbin

How behaviour develops

Behavioral Embryology. Edited by G. Gottlieb. Pp. xix+369. (Studies in the Development of Behavior and the Nervous System 1.) (Academic: New York and London, October 1973.) $22.50.

The first of the four sections in this book is an introduction to behavioural embryology, by G. Gottlieb. Then there are sections on embryonic motility and its neural correlates (Hamburger; Provine; Foelix and Oppenheim; Berrill); hatching: hormonal physiological and behavioural aspects (Oppenheim; Corner, Bakhuis and van Wingerden); and sensory processes: embryonic behaviour in birds (Vince; Impekoven and Gold).

The subject is obviously of the first importance; few would quarrel with the idea that one of the best ways of approaching an understanding of adult form and function is to study their development. It is a pity that the misleading name 'behavioral embryology' has been adopted for what should be the embryology (or ontogeny) of behaviour.

The first two volumes of this series are intended to present a "detailed explication of the major 'philosophical', theoretical and empirical issues" involved. Since Gottlieb's introductory essay is presumably partly an attempt to explicate the philosophical, theoretical and empirical issues, it is somewhat disconcerting for the reader to come across an apparent confusion (pages 31, 32) between neural specifities and neural connections, which are not at all the same thing. Dr Gottlieb is in good company here, since this is a fairly widespread confusion. It does suggest, however, a certain laxity of approach; and this impression is not helped by a passing reference (page 25) to retinal cells connecting ("in a general way") to cells in the visual cortex.