strument in high-energy physics research. For this reason the book has rightful claim to a place in reference libraries both for its account of an earlier age in particle and nuclear physics and for the reminder that emulsions may still have a small but significant role to play in future experiments where its particular properties—foremost amongst these being its high spatial resolution—are required.

In detail the book, dealing as it does with the application of the nuclear-emulsion technique, tends to give a somewhat fragmentary view of physics, very often giving only passing reference to the results from techniques that have largely superseded emulsion. In the one area of physics in which the emulsion technique still prospers, that of hypernuclear physics, the book is obviously out of date—most glaringly when citing the equivalence of the binding energies of the hypernuclei H and He as evidence of the charge symmetry of the Λ–N interaction. Their disparity, now conclusively proven, was noted as early as 1964 by Mahlon Raymund to be evidence of charge symmetry violation.

There are also some notable omissions, the most surprising perhaps being the only scant mention of the Barkas's own work, which demonstrated that different stopping powers were applicable to slow moving positively and negatively charged particles. Further, having discussed at length the determination of the lifetime of the π^0 meson using the emulsion technique, Barkas dismisses the upper limit of the lifetime of the Σ^0 hyperon (which was determined in precisely the same way) as an assumption, not a measurement.

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Fundamental Interactions and the Nucleus

R. J. Blin-Stoyle
345 pp. Elsevier, New York, 1973. $19.50

I approached this book with a good deal of interest because it purports to bridge the chasm between two allied fields, nuclear physics and particle physics. Indeed the author emphasizes the necessity to understand the allied field in order to do research in one's own field, quite apart from the general educational usefulness of such knowledge: "... nuclear studies can still provide significant and important information about some aspects of the fundamental interactions ..."

Alas, the book does not convince at least this particle physicist that the field of nuclear physics promises many new revelations about the fundamental interactions. This is not to say that R. J. Blin-Stoyle does not exhibit an encyclopedic knowledge and calculational ability to probe these possibilities. The following problem appears inherent for all but some unforeseen large experimental effect: Any discrepancy between the predictions in nuclear physics based on elementary-particle theory and the experimental results is usually assigned to a lack of knowledge of nuclear physics, such as off-mass-shell corrections, exchange effects, many-body effects and nuclear wave-function uncertainties. For example (page 155), "It [a conflict of experiment and prediction] may be due to the contribution of second-class currents ... or it may be due to too great a faith being placed in nuclear models and wave functions." In fact the book generally makes the opposite argument: calculations obtained from particle theory are extremely useful as a probe of our knowledge of nuclear physics.

Viewed in the latter manner, the book represents a very useful discussion of applications, calculations and state-of-the-art techniques. Any nuclear physicist interested in learning the details of such calculations should read and study this book. Its value lies in collecting in one place the many current problems and attempted solutions. It covers the weak interactions (such as beta decay, unusual currents, mu-capture, the weak interaction between nucleons), time-reversal noninvariance (detailed balance), electromagnetic interactions (charge dependence of the internucleon interaction, isospin) and a short chapter concerning the strong interactions. There is extensive reference to original papers and reviews of great use to the reader. In general the discussion is complete, although details sometimes obscure the important lines of the argument.

I have one strong reservation, and that concerns the statement based on the proton-proton, neutron-proton, neutron-neutron effective range parameters that charge independence of the strong interaction "*is* an approximate independence and not an exact one ..." This statement is in flat contradiction to what particle physicists believe, and therefore my immediate reaction was that it was wrong. But how do I prove that? Luckily I did not have to work very hard, because P. U. Sauer [Phys. Rev. Lett. 32, 626 (1974)] demonstrates that, due to the lack of knowledge of the nuclear potential at small distances, the proton-proton effective range parameters are not determined accurately. Sauer concludes, "Thus, nucleon-nucleon scattering experiments are unable to establish the degree of charge dependence in the nuclear force in a model-free way." This conflict among nuclear physicists about a cherished idea of particle physicists allows the particle physicists to retain the idea, remaining clear of the battlefield.

In conclusion I believe that the book is a valuable contribution to the field of nuclear physics, especially for those experimental and theoretical nuclear physicists who wish to use particle theory as a probe for understanding the nucleus. The fact that the book does not, however, fulfill the author's intentions should not prevent one from reading the book with profit.

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Radiation Chemistry of Monomers, Polymers and Plastics

Joseph E. Wilson
633 pp. Marcel Dekker, New York 1974. $49.50.

Radiation chemistry has developed into a very broad subject that has benefited from input by experimental and theoretical chemists, chemical physicists, physicists and biophysicists. The time scale of its studies and interests now extends from the picosecond region to periods of years. It excites and stimulates studies pertaining both to the origins of organic compounds and of life and to the chemistry of the universe, and it arouses also the interest of, among others, the polymer chemist, who sees in it new ways of synthesis of compounds and structures that, perhaps, cannot be produced so efficaciously or so economically by other techniques.

This book is divided into ten chapters; the first three (comprising almost half the subject matter) are intended as an introduction to the field. The other seven refer respectively to various aspects of radiation polymerization: in homogeneous systems, in the solid state, cross-linking and scission, polymers, polymer films and grafting.

That this book has been published at all is in itself a proper matter of congratulation to its author, J. E. Wilson, who has, rather obviously, acquired his degree of expertise in the subject mainly by extensive reading of original research reports and, to a major extent, of abstracts, collations and reviews. It is unfortunate that a publication date of 1974 represents a task of literature review terminated, for the earlier (introductory) chapters about 1964 and for the latter chapters in 1970 (or early 1971) and even then but scantily.