

The struggle for priority of recognition

Originality and Competition in Science. A Study of the British High Energy Physics Community

Jerry Gaston

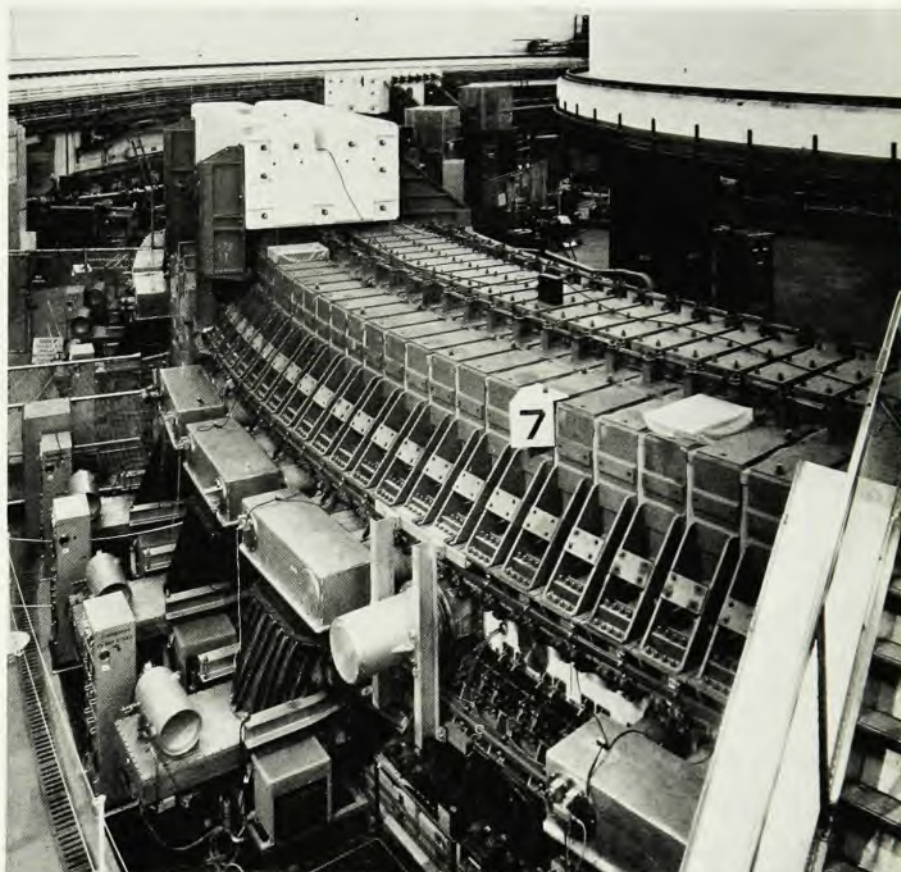
209 pp. U. of Chicago Press, Chicago, Ill., 1973. \$10.95

Reviewed by E. H. S. Burhop

Physicists are not especially noted for their admiration of the social sciences. Where they notice them at all they tend to adopt a somewhat condescending attitude. In this book the tables are turned and the British high-energy physics (HEP) community is given the same kind of treatment, complete with mean residuals, regressions, chi squares, product-moment correlations and F ratios as has already been lavished on countless groups throughout the world from the lesbians of Lesotho to the dishwashers of Detroit.

As a very innocent member of the community that the survey sets out to dissect, I must say I stand aghast at the primeval wickedness of my colleagues alleged to have come to light in the course of the survey. The struggle for priority of recognition seems to dominate everything. You must keep quiet at meetings or else your colleagues will pinch your ideas! There is a real risk that referees will delay your papers to give themselves a chance to get in first. Even when you apply for a job you must beware lest members of the interviewing panel, in turning you down, purloin your program. To call it all a rat race is unfair to rats! The only crumb of comfort I could gather is that things are supposed to be even worse in the US high-energy fraternity.

Of course there may be a germ of truth in some of this, but things are not at all like it in reality. I suspect some of the interviewees were leading the author on. The question of who first thought of ideas is a notoriously difficult one to resolve. Most new ideas are comparatively small developments of ideas derived from others. After all it was in relation to our own profession that the remark was made that "we stand upon the shoulders of giants." Physicists, like other creative workers, often absorb the ideas of others, genuinely forget where the idea



The 7-GeV Proton Synchrotron at the Rutherford Laboratory in the UK reached full power in 1963. Jerry Gaston discusses the sociology of the British high-energy physics community in his book *Originality and Competition in Science*, which is reviewed here.

originally came from and then practically deceive themselves into believing that the idea was entirely their own. I think the credulity the author gives to these stories, suggesting the practices reported are widespread while, no doubt adding to the spice of the book, reflects to some extent on his own judgment.

Despite this criticism Jerry Gaston has done a thorough job both on the collection of the data and their analysis using the most "with it" statistical methods, and it will certainly establish him as one of that still small, but rapidly increasing body of specialists in the sociology of science. I suppose it is a little unkind to suggest that conclusions such as scientific productivity being a function of professional age, and recognition in turn a function of productivity, could have been reliably

forecast without requiring such a sophisticated statistical study.

Nevertheless Gaston reaches other conclusions that are not so obvious. For example, while phenomenological theorists receive more recognition than experimentalists for their research, abstract theorists receive the least recognition in the whole community although they are the most prolific publishers. Again, while it is not surprising that "Competition in HEP is prevalent and is more severe for theorists than experimentalists," yet it is surely strange that "secrecy is not positively related to the probability of being anticipated," a conclusion that differs from one reached in a similar survey of US physicists.

The book will be read with interest by physicists generally, especially by the victims themselves and, albeit a

DYNAMICAL PROPERTIES OF SOLIDS in three volumes

Edited by G. K. HORTON

(Rutgers University)

and A. A. MARADUDIN

(University of California, Irvine)

This series of volumes contains detailed discussions of all topics of current theoretical and experimental interest in the field of lattice dynamics. The discussion of these topics is prefaced by chapters dealing with the fundamental concepts of the theory of lattice dynamics, which make this series of books a self-contained exposition of the subject. Each chapter is written by one or more experts in the subject matter of the chapter. These books should be of interest and of use to all workers in the field of the dynamical properties of solids, as well as to solid state theorists in general.

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1975 in preparation

NORTH-HOLLAND

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little smugly perhaps, by the non-HEP community. It is attractively produced and I found John Ziman's foreword not the least attractive part of the whole publication.

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Particle Physics: An Introduction

M. Leon

268 pp. Academic, New York, 1973.

\$14.50

In some measure the maturation of a field of physics can be established by the audience to whom introductory texts are addressed. When this audience begins to include advanced undergraduates, one may with reasonable confidence conclude that an agreed-upon and significant body of knowledge has been accumulated. Further, one may be quite sure that this wealth of knowledge has sufficient importance in physics as a whole as to command the attention and excite the imagination of this group of budding physicists.

On this basis, at the very least, elementary-particle physics has certainly shown very healthy signs of maturity. The book by M. Leon represents one of several introductory volumes that present to advanced undergraduates and graduate students the basic ideas and intellectual developments in particle physics. The selection of topics discussed shows both good taste and pedagogical accuracy. After reviewing basic facts about Lorentz covariance and relativistic-wave equations, the author treats the very important subjects of symmetry, isospin and unitary symmetry and discusses the evidence for the plethora of resonances and the beautiful ideas on how they may be organized by use of these symmetries. Standing on this solid foundation of hard facts and elegant concepts, Leon presents a variety of more speculative, less well established, but enormously intriguing ideas floating about on the fringes of research in particle physics: quarks, bootstraps, and the like.

This book certainly is successful in its selection of topics of importance. The omission of certain matters and the discussion of others, however, weakens what might otherwise be a valuable as well as useful textbook. For specific illustration let me mention an omission and a weakness of dis-

cussion. In a generally very attractive chapter on weak interactions, the author comes to the verge of (but omits) the ideas of the partial conservation of axial currents and of the algebra of currents. To have discussed currents for so long and to have not brought to the reader the beautiful developments of a decade ago is quite unfortunate. Further, in his section on SU(3) symmetry and the broken nature of that symmetry, I feel Leon has made a false pedagogical step by passing without comment on the issues involved in the understanding of broken symmetries in relativistic quantum physics. It is useful to contrast the presentation here with the fuller treatment in the admittedly more ambitious book by Stephen Gasiorowicz, (*Elementary Particle Physics*, Wiley, 1967).

On the basis of these short remarks I would encourage the student to utilize the text by Leon in his introduction to particle physics but by no means to rely on it alone. This book used in conjunction with the far more satisfactory, albeit more advanced, volume of Gasiorowicz might well make a useful pair in a senior or graduate course. The interested student can then rather naturally flow into a study of heavier material and even the more casual student will be tempted. Just in passing I found it remarkable that the text by Gasiorowicz, generally regarded by students as first-rate, receives no bibliographical mention in this book. Perhaps in the edition of this book that cleans up the several typographical errors, this omission can be rectified.

HENRY D. I. ABARBANEL

National Accelerator Laboratory
Batavia, Illinois

Lord Rutherford

Norman Feather

195 pp. Crane, Russak, New York, 1973.

\$10.50

Descriptions of Ernest Rutherford's career are customarily trisected into his three professorships, at McGill, Manchester and Cambridge Universities. By chance, former research students from each of these institutions have written lives of their mentor. A. S. Eve (*Rutherford*, 1939), as befitted his generation, wrote a "Victorian" life and letters. The narrative of this "authorized" work, in fact, is little more than connective prose between letters. In apparent rebellion against this type of product, Norman Feather (*Lord Rutherford*, 1940) wrote a "scientific biography." Finally, E. N. da C. Andrade (*Rutherford and the Nature of the Atom*, 1964) furnished us with the