ment in organized human activity'. However, despite the supposed common interest, the fact is that O.R. men and social scientists have in the past diverged in the way they have formulated their problems and analysed them; and the early hope that most O.R. teams would be multi-disciplinary has not been fulfilled. The conference was in one aspect an attempt to effect a new convergence, or at least to establish the reasons for divergence.

Few of the 35 papers presented actually tackle directly the issue of where common ground lies. This is left largely to the sponsors of the five sections of the conference, who introduce and comment on the papers in their sections. It is impossible to summarize and comment on all the papers, and also pointless because the book itself contains an excellent synopsis. The quality of the papers, although varied, is on the whole very high indeed. This review will refer mainly to those papers which referred in one way or another directly to the relationship between O.R. and the Social Sciences.

Dr. A. T. Welford's paper hasn't a mathematical symbol or an obtrusive statistic in it. In examining the analogy between a man working with a machine and a man working with another man, Welford shows that a bridge can be built across the gap between experimental psychology (which is concerned with the former) and social psychology (which is concerned with the latter). There is no direct mention here of practical problems or of O.R. But likewise many of the papers presented by O.R. practitioners for this conference could have been written had social science never existed.

But some contributors did set out to be bridge-builders. Professor Rapaport of the University of Michigan, in his paper on Conceptualization of a System as a Mathematical Model, discusses the possibility of shifting from mechanical and organic models of systems to mathematical ones. He is concerned to abstract completely from the content of natural systems to their common form by the use of mathematical homologues. Although Rapaport's models are not the kind O.R. scientists use, the paper represents a suggestion that the language of mathematics might with profit be used to indicate the analogies between social systems and other systems and in doing so increase understanding of social systems. In the discussion following the sectional papers on 'Systems Theory', in which Rapaport's paper appears, there is some adverse criticism both from O.R. scientists and social scientists, mainly stressing the dangers of divorcing form from content too rigorously. One contributor pointed out that the difficulty in using mathematics to build abstract social-system models is that until social science has some agreed definitions of its concepts no one will be clear what the symbols stand for and matters will be more confused than ever.

Professor Ackoff, of the University of Pennsylvania, one of the most eminent O.R. scientists in the United States, attempts some bridge-building, at a different level, in his paper Structural Conflict within Organization. He constructs a mathematical model of structural conflict, points out that this general formulation might lead to prescriptions for ending destructive conflict, adds that since many O.R. problems are sub-unit

problems, O.R. solutions could possibly compound structural problems, and suggests that the behavioural scientists might help the O.R. men by directing their attention to organizational structure, and developing a capacity for diagnosing structural conflicts.

The conference notwithstanding, there is still much confusion in the 'twilight zone' between O.R. and social science. Such deliberate bridge-building as was attempted came mostly but not entirely from the O.R. men. Professor Cook in particular worked very hard at it. I should guess that most social scientists feel that social systems are too complex, too varied, and too idiosyncratic for their practical problems to be reducible to a few general mathematical forms. Neither are most social scientists numerate enough to be sure of themselves when they look in the direction of O.R. O.R. scientists, on the other hand, can see that the implementation of the solutions they propose might not take place at all (an interesting paper by Professor Ratoosh of the University of California claims that many good solutions are left unused) or might founder because of human cussedness or organizational ineptitude. They would genuinely like the help of the social scientists whom they believe to be capable of systematic thought about such things. However, the role of 'obstacle shifter' might not seem to the social scientists to be an attractive substitute for activities like building new (verbal) theories.

As a sociologist, I found this book difficult to review. Some of it I did not understand at all, some of it I found very difficult, and I was only really at home with the papers of the organizational sociologists; but to work through all the papers was well worth the effort. The O.R. Society is to be congratulated for having assembled such a distinguished and diverse array of talent, and the editors and sponsors deserve praise for giving the diverse presentations a structured setting which revealed clearly the points of shared and discrepant interest. When the day comes, as it surely will, when a new and recognized university discipline of organization study emerges, the Cambridge Conference and the present book will be regarded as important mileposts.

T. LUPTON

Rehabilitation of the Hand, 2nd Ed. By C. B. Wynn Parry. (Pp. x + 367 with Index; 92s. 6d.) London: Butterworth. 1966.

In the eight years since the first edition of this book was published progress has been such that in addition to extensive re-writing, several new sections have been included. These range from a description of changing concepts in the function of the intrinsic muscles to details of special physiotherapy techniques, remedial exercises and games, and some very practical illustrated instructions on the making of splints.

The author's description of a method for the retraining of sensory function in the hand affected by peripheral nerve injury is, as Pulvertaft points out in his foreword, of especial interest.

In the chapter on resettlement, a timely plea is made for a closer integration of the various agencies involved in this problem. Reference is made to the role of the Industrial Medical Officer as intermediary between hos-

pital and employer but his job is described as 'often difficult as there is room for a better appreciation of the problems of the disabled person in industry'. One would like to think that these difficulties are not as serious as is suggested, at least in those industries with a medical service, and that the Industrial Medical Officer can play a more positive role.

In this section also, significant increases in the remuneration available to the disabled and in the number of Government Training Centres and Industrial Rehabilitation Units have been overlooked. A textbook is probably not the best place in which to include this type of detail which is so liable to change. It might be preferable to give a general description and indicate where up-to-date information is obtainable.

This minor comment detracts in no way from the excellence of this work. There will be no need to recommend it to those who, like the reviewer, found the first edition such a valuable addition to the literature. It should be studied by all who in any way have an interest in the treatment, rehabilitation, and resettlement of patients with hand disability.

J. D. CAMERON

A Handbook of Industrial Toxicology. By D. C. Trainor. (Pp. 153; 45s.) Sydney and London: Angus and Robertson. 1966.

This book, which is the first on industrial toxicology to be published in Australia, is chiefly for use in New South Wales. It is written by a surgeon who took up his present office of Senior Medical Officer in the Department of Occupational Health, New South Wales, eight years ago. There are two excellent chapters which form a good introduction to cover the subjects of modern pesticides and dust diseases. Each chapter in the book is divided into a lay section followed by a medical one, which has the advantage that the layman will undoubtedly read the medical section and this is important for many of the warnings are only given in the medical sections. Certain items of information are important, such as that silver solder may contain a high proportion of cadmium (p. 26), but certain items are lacking, for example, there is no mention of the brownness of these cadmium fumes, which is their main warning characteristic.

The usefulness of the book is diminished by its departing from the excellent tradition, probably started by Alice Hamilton, of always quoting the references to any statement or disastrous occurrence. Mr. Trainor simply gives a list of references at the end of each chapter without any indication in the text which author supports which statement; for example, on page 107, he reports that a man who welded in a fat residue tank died from pulmonary oedema because of the fumes of acrolein. It is impossible by reading the references at the end of the chapter to decide which paper reported this incident.

In this book there are several controversial statements, for example on page 57, . . . 'Carbon monoxide is not known to have any toxic action *per se*'. He is almost certainly here alluding to the chronic poisoning, but in his own words on page 18 ' . . . irrevocability of the spoken word and the spent arrow is sometimes merciless-

ly demonstrated in the law courts when an ill-considered opinion or report disintegrates, and its author sweats profusely under the searing head of skilled cross-examination.'

It is an interesting book to read but cannot be recommended to the uninitiated because not only are there controversial statements in it, but the emphasis is attuned obviously to the conditions of work in New South Wales rather than in Great Britain.

J. R. GLOVER

Lifting in Industry. (Pp. 26; illustrated; 2s. 6d.) The Chartered Society of Physiotherapy, Tavistock House (South), Tavistock Square, London, W.C.1. 1967.

This pamphlet covers the field of 'Lifting in Industry' extremely well. It is the result of many years' work of a committee which included doctors and physiotherapists from industry. The illustrations are good and practical. The pamphlet does not attempt to suggest how these methods of lifting should be introduced into the factory and there are various ways of doing this, from the employment of a full-time physiotherapist in the larger works to the training of instructors in the training division of the medium-sized works. The method of a lifting demonstration for one half day by a lecturer from outside may serve to excite an interest in the subject but it is questionable whether a permanent impression is left in the works.

This pamphlet has been adopted by RoSPA for its training courses for instructors in lifting and manual handling in Birmingham and Cardiff and can be thoroughly recommended as the best reference guide on the subject. It is a pity that no acknowledgement or reference is given to T. McClurg Anderson, of Glasgow, whose pioneer work and book, *Human Kinetics*, forms the basis of the methods given in this pamphlet.

J. R. GLOVER

Thorium: Its Industrial Hygiene Aspects. By R. E. Albert. (Pp. 222; illustrated; 56s.) New York and London: Academic Press. 1966.

This book is one of a series planned by the American Industrial Hygiene Association and sponsored by the United States Atomic Energy Commission.

In a preface Dr. Albert points out that thorium is unusual in that the radiological health hazards encountered in industry are not caused by ^{232}Th , which is the long-lived parent isotope of the naturally occurring radioactive decay series and constitutes virtually the entire mass of natural thorium. It is from a variety of elements present in the decay chain of ^{232}Th that the hazards arise, these involving nearly every type of radiological health protection problem met with in the atomic energy industry.

For many years after its discovery in 1828 thorium had no industrial application, but the introduction in 1885 of the Welsbach gas mantle incorporating thorium nitrate led to a rapidly increased production of thorium, this diminishing later with the development of the electric light bulb. Up to 1950 over 90% of the reported industrial consumption of thorium was for gas mantles,