to δ-systems as "quasi-disjoint families". But this is hardly serious and is due simply to the fact that the authors are topologists.

As a set theorist, this reviewer has naturally required the assistance of a topologist during the preparation of this review and would here like to thank Frank Tall for some helpful discussions. All opinions expressed here, however, are due to the reviewer.

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Linear and combinatorial optimization in ordered algebraic structures, by U. Zimmermann, Annals of Discrete Mathematics, vol. 10, North-Holland Publishing Company, Amsterdam, 1981, x + 380 pp., $61.00, Dfl. 125.00. ISBN 0-4448-6153-X

Many optimization problems arise in connection with systems which incorporate discrete structures for which the mathematics is combinatorial rather than continuous: one thinks of sequencing, scheduling and flow-problems and of the great variety of questions which can be reformulated as path-finding, circuit-finding or subgraph-finding problems on an abstract graph. To match the growing interest in such problems arising from, for example, operations research and systems theory, the past thirty years have witnessed a vigorous growth in the theory and practice of combinatorial optimization.

A related, but perhaps less well-known, development has been in the application of ordered algebraic structures to optimization problems. This application is made relevant by the fact that many optimization questions depend essentially on the presence of two features: an algebraic language within which a system can be modelled and an algorithm articulated; and an ordering among the elements which enables a significance to be given to the concept of minimization or maximization. A familiar example here is a well-known method of resolving degeneracy in linear programming which depends upon the fact that the simplex algorithm may be extended to linear programs in which values are taken in a certain ordered ring.

By adopting this algebraic point of view we can make useful reformulations: certain bottleneck problems become algebraic linear programs; certain