hopelessly unmotivated, irrelevant and needlessly abstract. Even though one might like all pure mathematics courses to be presented in a better way, realistically one has to be cynical and warn a student, who knows how to do mathematics, but not necessarily how to remember unmotivated chunks of theory, that not all lecture courses in group theory are presented in this way. (I admit to exaggerating here to make a point. I should also mention that group theory is probably not the worst offender in this way.)

Finally I would mention that another student, this year, is attempting a similar analysis of automorphism groups of dicyclic groups. Also a glance through some of the older (pre 1930) group theory books provides some idea of the wealth of material in this general area which may be useful when planning out projects in group theory. (I suspect the same is true for other areas as well but my personal experience of projects has been more or less solely in this area.)

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BOOKS RECEIVED

"INTRODUCTION TO DIFFERENTIAL GAMES AND CONTROL THEORY"

By *V.N. Lagunov*

Published by *Heldermann Verlag*, Berlin, 1985, vii + 285 pp. DM 88. ISBN 3-88538-401-9

The main aim of the present book is to give a game-theoretic introduction to zero-sum two-person differential games. It is elementary and concise, not demanding from the reader any preliminary game-theoretic preparation and not requiring mathematical knowledge exceeding the modern technical-college course of higher mathematics.

To make it easier for the beginner to understand such a complex mathematical subject as a differential game the material is initially divided into two parallel streams: the elements of the general theory of games and the elements of the mathematical theory of optimal control. In the subsequent treatment both streams merge into a single channel: differential games.

"SECOND-ORDER SYSTEMS OF PARTIAL DIFFERENTIAL EQUATIONS IN THE PLANE"

By *L.K. Hua, W. Liu And C.-Q Wu*

Published by *Pitman Publishing*, London, 1985, 291 pp. Stg £16.50. ISBN 0-273-08645-6

This research note presents new results in the theory of pairs of second-order partial differential equations in the plane, with applications. Second-order systems of PDEs are reduced to their canonical form, from which the systems can be easily classified as elliptic, hyperbolic, parabolic

or composite. Boundary value problems, initial value problems and also the more complicated mixed problems are investigated.

Attention is paid both to bi-analytical function theory governed by elliptic systems and to applications in elasticity. The discrete phenomena of the uniqueness of the characteristic problems for hyperbolic systems are discussed; also, the spline finite strip method and some numerical analyses for functional equations are provided.

Readership: Researchers and graduate students working in PDEs, generalized hyperanalytic function theory and functional equations. Also engineers who use the method of PDEs to solve engineering problems, particularly in elasticity and electrostatics.

"MULTIGRID METHODS FOR INTEGRAL AND DIFFERENTIAL EQUATIONS"

By *D.J. Paddon and H. Holstein*

Published by *Clarendon Press*, Oxford, 1985, xii + 323 pp. Stg £30. ISBN 0-19-853606-2

Many problems in numerical analysis are reducible to the numerical solution of a system of algebraic equations. The multigrid method is a promising new technique for such problems which has been developed since the late 1970s. This volume contains the proceedings of a Summer School/Workshop on Multigrid Methods held at the University of Bristol in September 1983 and attended by many leading researchers in the field (most of the papers were revised later to include the authors' views and research up to July 1984).

BOOK REVIEWS

"THE BOOLE-DE MORGAN CORRESPONDENCE 1842-1864"

By *G.C. Smith*

Oxford Logic Guides, Published by *Oxford University Press*, 1982, Stg £19.00. ISBN 019-853183-4.

G.C. Smith of Monash University, Australia, has done mathematics and the history of mathematics a great service by editing the 90 or so letters between George Boole and Augustus De Morgan during the period 1842-1864. Smith has wisely divided the letters into the following categories:

1. Getting acquainted 1842-1845;
2. Mathematical logic and Ireland 1847-1850;
3. Probability and eccentricity 1851;
4. The laws of thought and marriage 1852-1856;
5. Books old and new; and homeopathy 1859-1861;
6. The controversy with Hamilton's successors; and the Jews 1861-1862;
7. From differential equations to spiritualism 1863-1864.

The book also includes short biographies of Boole and De Morgan, extensive commentary on the letters, almost complete bibliographies of both men, an appendix on Boole's theorem on definite integration and a historical epilogue concerning De Morgan's efforts to secure a pension for Boole's widow. All in all, Smith has crammed an incredible amount of information into 156 pages and the volume is handsomely produced by Oxford University Press.

The book contains the text of all the letters available to the author, though not De Morgan's reference for Boole's