[40] J. van Leeuwen (ed.), Handbook of Theoretical Computer Science, Volumes A & B. Elsevier Science Publishers: Amsterdam, 1990.

[41] D. H. D. Warren and F. C. N. Pereira, An efficient easily adaptable system for interpreting natural language queries, DAI Research Paper No. 155, Department of Artificial Intelligence, University of Edinburgh, 1981.

[42] J. Woodcock and M. Loomes, Software Engineering Mathematics. Pitman Publishing: London, 1988.

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Book Review

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Reviewed by Rod Gow

The volumes under review contain selected papers from a conference on group theory held at University College Galway during the period 1-14 August 1993. This conference was the continuation of a series of conferences on group theory held at the University of St Andrews in 1981, 1985 and 1989, with the next conference to be held in Bath in 1997. There were 285 participants at the conference, with numerous principal lectures, invited lectures, research talks and workshops on computational group theory to entertain them.

It seems to the reviewer that large scale conferences devoted to a rather broad theme are less common these days than once they were. In group theory, conferences on groups of Lie type, representation theory of algebraic and related finite groups, groups and geometry, or computational group theory are dominant. This probably reflects the fact that researchers' interests are more narrowly focused on their specialities and they may imagine that there is a better chance of a pay-off in terms of a publication by attending conferences offering a concentrated diet of specialized material. Looking through the papers under review, I noticed that many topics popular 25 years ago are no longer represented. These include finite simple groups, ordinary character theory and

permutation groups. This is predictable, given the success of the the classification of finite simple groups, although a revisionist school of mathematicians, devoted to improved and more convincing proofs of theorems and constructions in these areas, has come into existence.

I would always expect to find some novelties of an unexpected nature among the contributed papers and, in this case, I was not disappointed. Obviously, different people will respond to different themes but I enjoyed finding out about the existence of a group G that is a non-split extension of a free abelian group of rank 3 by $SL_3(\mathbb{Z})$ which is not residually finite and for which the associated 2-cocycle has infinite order. The relevant paper is *An army of cohomology against residual finiteness* by P. R. Hewitt (pp 305-313). Another paper that interested me was *An invitation to computational group theory* by J. Neubüser. Neubüser arranged a workshop on computational group theory (CGT) and the use of the GAP system during the second week of the conference and the paper reflects his thoughts on CGT. He describes problems that may be studied by using GAP, mentions some of the history and triumphs of CGT, and finishes by expressing his concerns about the future of CGT and the value in which it is held. It is clearly annoying to find all the hard work put into creating CAYLEY or GAP often ignored by researchers who take for granted the existence of these CGT packages. The paper includes a substantial bibliography.

Five main lecture courses, consisting of about five lectures each, were given by J. L. Alperin, M. Broué, P. H. Kropholler, A. Lubotzky and E. I. Zelmanov, and articles based on their lectures are presented in the proceedings. The article by Lubotzky, *Counting finite index subgroups*, contains a large amount of information, and should make worthwhile reading for the enthusiast or the enquiring novice. A memoir on subgroup growth, prepared by Lubotzky as a background for his lectures, was made available by the Mathematics Department in Galway. A paper by A. Shalev, *Some problems and results in the theory of pro-p groups*, relates well to Lubotzky's paper, and also to that of Zelmanov (*Lie ring methods in the theory of nilpotent groups*). Zelmanov's paper

touches briefly on his solution to the restricted Burnside problem, for which he was to receive a Field's medal in 1994.

The editors of the proceedings have worked hard to obtain a uniform format for the published papers. Often conference proceedings consist only of photocopies of manuscripts, with the end-products of various unpleasant word processing systems lying discordantly side by side. This is not the case here. I did not notice many glaring typos, although I did see the name Heisenberg rendered as Heizenberg twice. I think these proceedings are something perhaps to be browsed at by interested parties, rather than purchased outright. They are well produced and give some idea of certain current interests in group theory, without really touching on several of the leading research topics.

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