A car park has spaces numbered $1, 2, \ldots, n$.   One morning n drivers arrive in turn, each wishing to park in a certain space (which they each choose at random).   A driver who wishes to park in space k does so unless it is occupied, in which case he chooses the first vacant space from $k+1, k+2, \ldots, n$.   If these are all occupied he leaves in disgust.

The probability that all the drivers can park is $(n+1)^{n-1}/n^n$. Prove this.

2.   Ship A is moving due east at constant speed and, at a certain moment, ship B is moving due north at the same speed towards A.   If B maintains this speed but continuously alters course towards A how closely can B approach A ?

3.   Des McHale asks the following:

Say that a group G is $\underline{n\text{-abelian}}$, $n \in \mathbb{Z}$, is

$$(xy)^n = x^n y^n, \quad x, y \in G).$$

For which n is it true that:

G n-abelian implies $G(n+1)$-abelian ?

Also, what happens if $n+1$ is replaced by $n-1$?

As usual I'd welcome any historical references to the problems discussed here.

Phil. Rippon,
Mathematics Faculty,
Open University,
Milton Keynes.

CONFERENCE REPORTS

GROUPS IN GALWAY CONFERENCE (13-14 May, 1983)

The main speakers at the Conference were Richard Watson (Maynooth), John Hannah (U.C.G.), Peter Cameron (Oxford), Martin Liebeck (Cambridge) and Colin Walter (U.C.D.). Gerard Enright (M.I.C., Limerick) was unable to give his talk due to illness and Tom Laffey (U.C.D.) and Sean Tobin (U.C.G.) very kindly stepped in at short notice to fill the gap.   Other short communications were given by Roderick Gow (U.C.D.), James Ward (U.C.G.), Brian Abrahamson (Flinders, Adelaide), Michael Barry (Carysfort) and Martin Newell (U.C.G.).

The Conference certainly brought home the range and variety of Group Theory and its applications, a fact not fully appreciated nor understood by those not in the area.   In the last year alone, three advanced (i.e. postgraduate at least) textbooks have come on the market, namely Curtis and Reiner "Methods of Representation Theory" Vol. I containing over 819 pages (with volume II to follow), W. Feit "The Representation Theory of Finite Groups" (502+ pages) and Huppert and Blackburn "Finite Groups", Vols. II and III containing over 1000 pages.   These books are destined to become standard references in their own branches of Group Theory.   In the 70's and early 80's also, numerous advanced textbooks on permutation groups, groups of graphs, cohomology of groups, Galois groups, varieties and classes of groups, topological groups, Lie groups, combinatorial group theory, crystallographic groups, group rings and matrix groups have appeared and the subject is expanding into most unlikely areas such as applications in Computer Science and Geology.   (For all this and as a contribution to Mathematical Education note that it is, I believe, agreed among Group Theorists that Group Theory is certainly not a topic for Secondary Schools' curricula.)

The first main speaker at the conference was Richard Watson who spoke on "Some aspects of profinite groups".   A

profinite group is a topological group which may be considered
as the inverse limit of finite groups and he gave an interest-
ing survey of these groups and the problems associated with
them.   These groups arise naturally as subgroups of the Galois
group of a Galois extension and this seems to have given an
impetus to research in the area.   Other problems arise from
trying to discover which theorems from finite group theory
will extend to profinite groups and whether other concepts
such as free or relatively free group can apply to the class
of profinite groups.

John Hannah spoke on "Putting coordinates on lattices".
John in his usual excellent expository style explained how von
Neumann wanted to "put coordinates on" his lattice in a way
compatible with ring operations - von Neumann was considering
rings of operators on Hilbert spaces in which the set of proj-
ections formed a complemented modular lattice.   This led to
von Neumann regular rings and the rest of the talk explained
the examples and problems associated with these *(See this issue,
pages 21-28).*

Peter Cameron spoke on "Infinite permutation groups". In
particular, he described some of the properties of Rado's
graph, which is the unique countable ultrahomogeneous graph,
and showed how it gives rise to a number of interesting per-
mutation groups.   He also gave an account of some work on the
levels of homogeneity and transitivity of permutation groups.

Martin Liebeck's talk entitled "Some applications of the
classification of finite simple groups to permutation group
theory" explained how the recent classification - together with
a result of O'Nan-Scott can be utilised to prove theorems on
permutation group theory.   As a sample, he proved four
theorems (and one "almost-theorem") and also interestingly
pointed out how a classification of the maximal subgroups of
the finite simple groups woul lead to other theorems and
reported on work being done in this area.

Colin Walter spoke on "Automorphism groups of graphs"
and having explained that he was an Algebraic Number Theorist
only recently becoming involved with graphs, then proceeded to
show his versatility with an excellent survey of the area.
He proved a number of theorems on connections between trans-
ivity, girth, valancy of a graph and its automorphism group
of which I state the one I found most interesting:- Theorem
(Tutte) "There is no 3-valent t-transitive graph with t > 5".

The shorter talks also contributed much to the enjoyment
of the programme.   They consisted mainly of announcements and
explanations of recently acquired results of the speakers.
Roderick Gow spoke on "Permutation representations of some
classical groups on the cosets of certain classical groups";
James Ward on "On subrings which permute with their conjug-
ates"; Brian Abrahamson on "Quaternion monomials"; Michael
Barry on "Computing dimensions of irreducible modules"; Sean
Tobin on "Groups with $[n \to t]$"; Tom Laffey on "Maximal comm-
utative subalgebras of algebras" and Martin Newell on "Meta-
belian groups of exponent 8, II".

We have asked the main speakers to write up their talks
in survey form for the Newsletter and hopefully some of these
will appear in future issues.

The Group Theory Conference in Galway now appears to be
an annual event.   Its appearance coincides with the formation
of the I.M.S. and has continued annually since then.   We are
grateful to the I.M.S., R.I.A., U.C.G. and some of the part-
icipants for financial support.   We also thank the Mathematics
Department of U.C.C. for arranging for Martin Liebeck to be
present in Ireland for the Conference and for most of his
financial support. (It should be noted that the total budget
for this Conference is less than the (single) fee for another
Conference held in Galway around this time.)   Most of all, we
would like to thank the participants for their continued sup-
port by their presence and participation.   This year, we had
22 participants, a group small enough for mathematical and

social interaction and large enough for viability. Their presence and interest encourage us and we will continue .....

7. Hurley,
Mathematics Department,
University College,
Galway.

THIRD CONFERENCE ON APPLIED STATISTICS IN IRELAND

The Third Conference on Applied Statistics in Ireland was held in the Slieve Donard Hotel, Newcastle, Co. Down, on March 28/29, 1983. This followed the pattern set by the two previous conferences by inviting contributors to present a 25 minute paper on an applied statistics topic of their choice. However as a new innovation this year a special session on Statistical Computing was advertised in advance and several statisticians involved in this area were asked to provide appropriate papers. Micro-computers were provided for running statistical programs and a display of modern micro-computer equipment was arranged.

The Conference program was divided into five sessions. In the first session Professor D. Conniffe (ESRI) discussed unrecognised similarities between statistical theory in different fields leading to duplication of methodologies with particular reference to Biometrics and Econometrics. Dr. F. Murtagh (UCD) considered the theory of correspondence analysis and gave three examples of its use. Professor R.E. Blackith (TCD) described the interpretation of some politically sensitive epidemiological surveys resulting in bizarre statistical treatment.

In the session devoted to statistical computing Dr. A. Stuart (TCD) drew attention to recent advances in information technology and indicated some ways in which electronic devices

may be used by statisticians to enhance more traditional data collection procedures. Mr. C.E. Rogers (NUU) described GENSTAT, a general purpose package intended mainly for use by professional statisticians. Dr. J. Bradley (ESRI) outlined the features of the TROLL computer system devised for econometric modelling applications. Mr. L. O'Reilly (Central Bank of Ireland) described some packages and programs available for analysing time series. Miss A. Timberlake (Timberlake Clarke Ltd.) presented an overview of the specific needs for data management by statisticians and of the software availability in this area with particular reference to SIR, RAPPORT, SAS, P-STAT and SPSS. In the final paper of this session Dr. D.M. G. McSherry and Mr. D. Duffy (QUB) described and demonstrated a micro-computer package, INTERSTAT, for carrying out a range of parametric and non-parametric statistical tests interactively.

The third session was devoted to Biometrics. Dr. M. Mulvihill (TCD) presented a paper describing a problem in the selection of AI sires in Ireland involving the importation of sires from Britain and concluded that genetic environment interactions occur such that reranking of bulls occurs between Ireland and Britain. Mr. E.A. Goodall and Dr. D. Sprevak (QUB) defined a stochastic model to describe the milk yield of a dairy cow. Dr. J. Connolly (AFT) presented a paper dealing with some aspects of the design and interpretation of plant competition experiments and emphasised the role of plant density as a critical variable in these investigations. Professor S.M. Lavelle, F.H. Given and U.S. Khoo (UCG) presented a paper on computer-aided diagnosis in improving the accuracy of clinical diagnosis.

In a session on Technometrics Dr. S. Ferguson and Dr. D. Sprevak (QUB) described the influence of random fluctuations in the geometric dimensions of semiconductor devices on their performance. Mr. E.G. McEntee (Ulster Polytechnic) gave a case study involving the determination of the optimum sampling frequency in monitoring the quality of output of a continuous

process. Mr. R. Beattie (Gallagher Ltd.) described the application of cumulative sum techniques for laboratory quality control, balancing the need to monitor both long- and short-term movements. Dr. S.I. McClean and J.O. Gribbin (NUU) described an estimation procedure for failure time data which is both right censored and left truncated with particular reference to manpower planning.

In the final session Dr. P. Boland (UCD) provided a bio-graphical sketch of W.S. Gosset in which he quoted from Gosset's personal correspondence with Fisher and other eminent statisticians of his time. (See pages 45-56 in this issue) Mr. E.S. Gillespie (Ulster Polytechnic) provided the final paper of the conference on the predicting and fitting ability of alternative models for flood estimation in which he tested the models by means of a data splitting technique.

The Conference was organised by Professor D. Conniffe, Professor A.A. Greenfield, Dr. A. Unwin and Dr. S.T.C. Weatherup. It is planned to hold another conference on applied statistics again next year. Details will be circulated later.

S.T.C. Weatherup,
Department of Agricultural Biometrics,
Queen's University,
Belfast.