THE AUSTRALIAN NATIONAL UNIVERSITY   47/1965

SCHOOL OF GENERAL STUDIES

DEPARTMENT OF STATISTICS
ANNUAL REPORT - 1964

Professor   E.J. Hannan

Senior Lecturer   C.R. Heathcote

Lecturers   W.J. Ewens
                    E.A. Fridriksdottir
                    J.H.T. Morgan
                    R.D. Terrell   (from 1st July, 1964)
                    P. Winer

Teaching Programme

	Initial Enrol- ment	No. Ex- amined	Examina- tion Deferred	H.Dn	Dn	Credit	Pass$^\alpha$	Fail
Statistics I	135$^\beta$	94	5	1	2	6	57	28
Statistics II	30	24	-	2	2	-	13	7
Statistics III Option A	6	5	-	-	-	-	3	2
Option B	7	6	-	1	-	-	2	3
Statistics IV	2	2	-	1$^\gamma$	1$^\gamma$	-	-	-
Master's Preliminary	6	3	-	-	-	-	1	2
Master's Degree (Thesis stage)	2$^\delta$							
TOTAL	188	134	5	5	5	6	76	42

α Including Pass with Merit .

β Includes six non-examination students.

γ One 1st class Honours; one IIA Honours.

δ Theses to be submitted after March, 1965.

The failure rate in Statistics I (30% of those examined) was lower than in 1963 (when it was 38%), and also slightly lower than the failure rate (about 32%) of preceding years.   Apart from chance fluctuations and the large number of withdrawals the difference would appear to be due to a reorganis- ation of the order in which material was presented to the students.

The failure rates in Statistics II and Statistics III were 29% and 45% respectively.   These figures are considerably higher than in recent years.   The Statistics III class included several students who had ignored warnings not to attempt the subject and the high failure rate was not unexpected.   However, the poor performanc of several of the Statistics II class was surprising.   Of the seven failures in this subject, one was a National Undergraduate Scholar and two others held Cadetships from the Bureau

of Census and Statistics. These results were offset to an extent by outstanding performances on the part of some of the Distinction students, and in particular, by the high standard achieved by the two students taking their final year Honours in Statistics IV.

Initial Enrolment by Faculties

	Statistics I	II	III	IV	Master's	Total
Economics	96	13	5	2	2	118
Arts	33	12	7	-	4	56
Science	-	5	1	-	2	8
TOTAL	129	30	13	2	8	182

Overseas Visits by Members of Staff

Dr. W.J. Ewens spent most of his study leave (January-June) at Stanford University. Professor E.J. Hannan is spending his study leave (from August) mainly at the Johns Hopkins University. Both Professor Hannan and Dr. Ewens visited other Universities in the United States. Dr. C.R. Heathcote attended the Symposium on Congestion Theory at the University of North Carolina in August.

Research Programme

Group Representations and Applied Probability. (Hannan) In particular the study of second order homogeneous processes on a globally symmetric space and associated problems of filtering, aliasing, interpolation and prediction.

Seasonal Variation. (Hannan) The estimation of a changing seasonal pattern and associated problems of control and regulation.

Multivariate Analysis of Variance for time series and estimation methods for systems of equations. (Hannan).

Tests for periodicity in a time series. (Hannan).

Mathematical Genetics. (Ewens) Diffusion processes, theory of the evolution of dominance, and self-sterility in populations.

Regression Theory. (Ewens and Terrell) Investigating effects of non-normality in multiple regression.

Random Walks. (Heathcote)   Rate of convergence problems in transient and positive recurrent walks with application to the theory of queues.

Branching Processes with immigration. (Heathcote)

Order Statistics. (Winer)   Order statistics and their application to estimation problems in censored samples.

Traffic Theory. (Morgan)   Queueing models relevant to traffic light problems.

Econometrics. (Terrell)   Investigation of fluctuations in the price of wool.

Publications

Ewens, W.J.   1.   The Pseudo-transient distribution and its uses in
                       genetics.   J. Appl. Prob. $\underline{1}$, 141-56.

                 2.   The maintenance of alleles by mutation.   Genetics,
                       $\underline{50}$, 891-98.

                 3.   On the problem of self-sterility alleles.   Genetics, $\underline{50}$.

                 4.   Correcting diffusion approximations in finite
                       genetic models.   Stanford Univ. Tech. Report 4,
                       April 1.

Hannan, E.J.   1.   The estimation of seasonal variation".   J. American
                       Statist. Assoc., December, 1964.

                 2.   The statistical analysis of hydrological time series.
                       In Proceedings of the National Symposium on Water
                       Resources, M.U.P., 1964.

Morgan, J.H.T.   * Synchronizing traffic signals for maximal bandwidth.
  (with J.D.C. Little) Operations Research, December, 1964.

      * Not a member of this University.