NEWS AND NOTICES

*Readers are invited to submit to the Secretary of the Institute news
items of interest*

Personal Items

Robert Bechhofer of the Department of Industrial and Engineering Adminis-
tration, Sibley School of Mechanical Engineering, Cornell University, is on
sabbatic leave for the academic year 1958–59. He is spending the period at
Stanford University where he is Visiting Professor of Statistics in the Applied
Mathematics and Statistics Laboratory and in the Department of Preventive
Medicine.

Douglas G. Chapman is on leave of absence from the University of Washington
during the current academic year and is a Visiting Professor at the Department
of Experimental Statistics, North Carolina State College, Raleigh, North Caro-
lina.

Dr. Sebastian B. Littauer has been appointed as consultant in Operations
Research and Statistical Quality Control at Calkin and Bayley, Inc., Industrial
Consultants, New York. Dr. Littauer is Professor in Statistical Quality Control
and Operations Research at Columbia University.

New Members

The following persons have been elected to membership in the Institute

October 17, 1958 to February 6, 1959

Ady, Robert M., B.S. (Monmouth College), Senior Engineer, *Sylvania-Reconnaissance Sys-
tems Laboratory, Box 188, Mountain View, California.*

Asher, Harold, Ph.D., (Ohio State U.), *Manager-Cost Analysis, Technical Military Plan-
ning Operation, General Electric Co., 735 State St., Santa Barbara, Calif.*

Boes, Duane C., M.S., (Purdue U), Research Fellowship, Purdue University, *Statistical
Laboratory, Purdue University, Lafayette, Indiana.*

Brown, Bradford, S., M.S., (U. of Illinois), Service Engineer, *Engineering Dept., E. I. DuPont
deNemours and Co., Buffalo Ave. and Chemical Road, Niagara Falls, N. Y.*

Calvin, James S., Ph.D., (Yale U.), Professor, Psychology Dept., U. of Kentucky, Lexing-
ton, Kentucky, *Department of Statistics, U. of California, Berkeley, Calif.*

Charles, Gerald T., B.S., (Roosevelt U.), Statistician, Remington-Rand Univac, 1902 West
Minnehaha Ave., St. Paul, Minn., *1402 N. DuPont Ave., Minneapolis 11, Minnesota.*

Chorneyko, Ihor Z., M.A., (Saskatchewan), Graduate Assist., *University of Alberta, Edmon-
ton, Alberta, Canada.*

Crawford, Gordon Bradley, B.S., (U. of Oregon), Graduate Assistant, *Dept. of Mathematics,
University of Oregon, Eugene, Oregon.*

Drew, Bruce A., B.S., (Wayne University), Chemist, Sr., Hercules Powder Co., Hopewell,
Virginia, *205 South 4th Ave., Hopewell, Virginia.*

Fasbinder, Stanley, M.A., (Wayne State U.), Teaching Fellow, Wayne State University
Detroit 2, Michigan, *620 W. Forest, Detroit 1, Michigan.*

Feldman, Dorian, B.S., (Yale U.), Research Assistant, *Statistics Dept., University of Cali-
fornia, Berkeley 4, California.*

626

Freiberger, Walter F., Ph.D., (Cambridge, Eng.), Associate Professor, *Mathematics Dept., Brown University, Providence 12, R. I.*

Hachigian, Jack, B.S., (U. of Michigan), Student, *Mathematics Dept., Indiana University, Bloomington, Indiana.*

Hamaker, H. C., Dr. (Utrecht U.), Chief Statistician, Philips Research Laboratories, Eindhoven, Netherlands, *% Bibliotheekcentrale, N. V. Philips' Gloeilampenfabrieken Eindhoven, Netherlands.*

Hastings, Wilfred Keith, M.A., (U. of Toronto), Electronic Data Processing Consultant, H. S. Gellman and Co., Ltd., 110 Bloor St. W., Toronto, Ontario, Canada, *1580 Bathurst St., Apt. 39, Toronto, Ontario, Canada.*

Hickman, David James, B.S., (Morehouse College), Instructor of Mathematics, *Mississippi Vocational College, Itta Bena, Mississippi.*

Hickman, Donald Louis, B.S., (Morehouse College), Instructor of Mathematics, *Mississippi Vocational College, Itta Bena, Mississippi.*

Ibbetson, David Noel Isserlis, B.Sc., (Imperial College, London), Statistician, Fisons Ltd., Harvest House, Felixstow, Suffolk, England, *8A Station Road, Edgware, Middx, England.*

Knight, William R., M.A., (U. of British Columbia), Graduate Student, University of Toronto, Toronto 5, Ontario, Canada, *590 Huron St., Toronto 5, Ontario, Canada.*

Kono, Kazumasa, M.Sc., (Kyushu U.), Assistant Professor, *Junior Course, Kyushu U., Otsubo Machi, Fukuoka, Japan.*

Legault, Richard R., M.A., (Chicago U.), Graduate Student, U. of Michigan, Dept. of Math., Ann Arbor, Michigan, *709 Indianola, Ann Arbor, Michigan.*

Marshall, Clifford W., M.S., (Polytechnic Institute of Brooklyn), Staff Member, Weapons Systems Evaluation Group, Institute for Defense Analyses, The Pentagon, Washington 25, D. C., *264 North Ocean Ave., Patchogue, N. Y.*

Miloslavsky, George C., Greigetender, Loma Art Textile Co., Inc., 52 E. 19th Street, New York 3, N. Y., *30 Sheridan Avenue, Staten Island, 4, N. Y.*

Mittman, Arthur, Ph.D., (State U. of Iowa), Director, University Examinations Service, State U. of Iowa, Examinations Service, *114 University Hall, Iowa City, Iowa.*

Mode, Charles J., Ph.D., (U. of Cal.), Assist. Prof., Montana State College, Bozeman, *Department of Math., M. S. C., Bozeman, Montana.*

Noel, Charles A., B.S. (Manhattan College), Associate Mathematician, *I.B.M., Watson Laboratory, 612 W. 115th Street, New York 25, N. Y.*

Onate, Burton T., M.S., (Iowa State College), Assistant Director, Office of Statistical Coordination and Standards, National Economic Council, Padre Faura, Manila, Philippines, *College, Laguna, Philippines.*

Richards, Dale Owen, M.S., (Iowa State College), Instructor, Iowa State College, Industrial Engineering Dept., Ames, Iowa, *Route 10 Aplin Road, Ames, Iowa.*

Sand, Francis M., M.S. (Brooklyn Polytechnic Institute), Graduate Student, General Electric Foundation Fellow, Princeton University, *Fine Hall, Princeton University, Princeton, N. J.*

Sathe, Yashawant Sadashiv, M.Sc., (Bombay University), *Graduate Student, Dept. of Mathematics, University of Alberta, Edmonton Alberta, Canada.*

Schwartz, Fred J., B.S., (College of Engr., N. Y. U.), Technical Writer, McGraw-Hill Book Co., Inc., 330 West 42nd Street, New York 36, New York, *1015 Washington Avenue, Brooklyn 25, N. Y.*

Thigpen, Charles C., M.S., (Univ. of Tenn.), Stat. Dept., *University of Tennessee, Knoxville, Tennessee.*

Thomas, Ralph E., M.A., (Ohio State U.), Assistant Division Consultant, *Battelle Memorial Institute, 505 King Avenue, Columbus 1, Ohio.*

Vanderbeck, John P., Graduate of Pharmacy (St. Louis College of Pharmacy), Head, Test and Evaluation Branch, Code 3035, U. S. Naval Ordnance Test Station, Test Depart-

ment, Michelson Laboratory, China Lake, California, *207 B. Mitscher, China Lake, California.*

Wonnacott, Thomas H., B.A., (U. of Western Ontario), Graduate Student, Princeton Univ., *Graduate College, Princeton, New Jersey.*

Zurick, Leslie, J., M.A., (Columbia U.), Statistician, Owens-Corning Fiberglas, Ashton, R. I., *Fundamental Plastics Research, Owens, Corning Fiberglas, Ashton, R. I.*

NEW EDITORIAL STAFF FOR *MTAC*

The Division of Mathematics of the National Academy of Sciences–National Research Council, Washington, D. C., announces that Harry Polachek, Technical Director of the Applied Mathematics Laboratory of the David Taylor Model Basin, has been appointed Chairman of the Editorial Committee for the quarterly journal *Mathematical Tables and Other Aids to Computation* effective January 1959. He succeeds C. B. Tompkins of the University of California at Los Angeles, who held the post since November 1954. The other members of the Editorial Committee are: C. C. Craig, A. Fletcher, E. Isaacson, D. Shanks, C. V. L. Smith, A. H. Taub, C. B. Tompkins and J. W. Wrench, Jr.

Mathematical Tables and Other Aids to Computation was founded in 1943 by R. C. Archibald with the aid of a grant from the Rockefeller Foundation and is published by the Division of Mathematics of the National Academy of Sciences–National Research Council. It features original papers in numerical analysis, high speed computer methods and other aids to computation as well as short articles reporting upon the latest developments in these fields. It serves as an information center on tables and other aids to computation appearing in the current literature not only in the fields of mathematics, physics, statistics, astronomy and navigation, but also in such areas as actuarial science, aeronautics, chemistry, engineering, geodesy, medicine and meteorology. A file of unpublished mathematical tables is maintained for use by subscribers.

Articles for publication in *Mathematical Tables and Other Aids to Computation* should be addressed to Harry Polachek, Editor, *Mathematical Tables and Other Aids to Computation,* David Taylor Model Basin, Washington 7, D. C.

Information on subscriptions may be obtained from National Academy of Sciences, Printing and Publishing Office, 2101 Constitution Avenue, Washington 25, D. C.

INTERNATIONAL CONGRESS OF MATHEMATICIANS 1962

1. The Secretary of the International Mathematical Union has announced that: The Committee authorized by the final plenary session of the Congress in Edinburgh to determine the location of the International Congress 1962 has accepted an invitation from the Swedish National Committee for Mathematics and the Swedish Mathematical Society in the following terms:

"To Mathematicians of all Countries.

The Swedish National Committee for Mathematics and the Swedish Mathematical Society have the honour of inviting you to the next International Congress of Mathematicians, to be held in Stockholm during the Summer of 1962.

We will do our best to make the Congress scientifically successful and enjoyable, hoping that it will stimulate the interaction between mathematicians in different fields and countries (Ake Pleijel, Chairman of the Swedish National Committee for Mathematics, and Goran Borg, Chairman of the Swedish Mathematical Society)."

2. The Republic of China (Taiwan) has been admitted to the International Mathematical Union through the Chinese Mathematical Society (Taipei, Taiwan) as the adhering organization.

STATISTICAL RESEARCH MONOGRAPHS
(Revised announcement)

The Institute of Mathematical Statistics and the University of Chicago have established a series of publications entitled Statistical Research Monographs.

The primary purpose of this series is to provide a medium of publication for material of interest to statisticians that is not ordinarily provided for by existing media. It will help fill the gap between journal articles and textbooks or treatises. Among the kinds of publications envisaged are:

New research results too lengthy for the usual journal article. In particular, authors will have ample scope for detailed exposition of their findings.

Research results of interest in both theoretical and applied statistics. At present authors of such material frequently find it necessary to publish part of their results in a theoretical journal and part in an applied journal.

Expository monographs in particular areas of statistics.

Discussions of statistical problems and techniques in particular areas of application.

Every attempt will be made to maintain the highest standards of scholarship.

Members of the Institute of Mathematical Statistics will receive a one-third discount on prepublication orders for monographs of the series when such orders are placed through the Treasurer of the I.M.S. A smaller discount will apply to post-publication orders.

The Editorial Board consists of David Blackwell (University of California), William G. Cochran (Harvard University), Henry E. Daniels (University of Birmingham), Leo A. Goodman (University of Chicago), Wassily Hoeffding (University of North Carolina), Jack C. Kiefer (Cornell University), and William H. Kruskal (University of Chicago).

Authors are invited to send manuscripts and correspondence concerning the series to Leo A. Goodman, Department of Statistics, University of Chicago, Chicago 37, Illinois.

ANNOUNCEMENT OF PRIZES AND RESEARCH ASSISTANCE

The Indian Society of Agricultural Statistics has instituted prizes and research assistance for the promotion of research in statistics (available to persons of all nationalities residing in India).

Prizes of Rs. 500/ — will be awarded in the fields of design of experiments, sampling, statistical genetics, and statistical theory and methodology, for articles of high merit published in the Journal of the Society. The first awards will be made on the basis of articles published in volumes 8 and 9.

Research assistance will be offered to five individuals up to a maximum of Rs. 500 to encourage promising workers who are not in a position to pursue research due to lack of suitable facilties or contacts. Research work done by recipients of assistance must be submitted for publication in the Society's Journal.

For further information concerning the prizes and research assistance, contact the *Secretary, Indian Society of Agricultural Statistics, % Indian Council of Agricultural Research Statistical Wing, Library Avenue, New Delhi-12, India.*

ANNOUNCEMENT OF AFFILIATE PLAN

The Institute of Radio Engineers has established an affiliate plan, under which members of selected technical societies are entitled to become affiliated with, and receive the publications of, some of the Professional Groups of the I.R.E. without having to join the I.R.E. itself. They need only pay the regular Professional Group dues, plus $4.50, rather than the larger fee $10.00) for full Institute membership.

The Institute of Mathematical Statistics has been approved for affiliation with the Professional Group on Information Theory (PGIT). The regular PGIT dues are $3.00. Institute of Mathematical Statistics members who are working in an area closely related to information theory may wish to take advantage of the affiliate plan.

The address of the Institute of Radio Engineers is 1 East 79 Street, New York 21, New York. Inquiries should be sent to Mr. E. R. Kretzmer at that address.

ANNOUNCEMENT OF NEW JOURNAL

Publication has recently begun of a new journal, *Cahiers du Centre d'Études de Recherche Opérationnelle.* The publishing institution is the Centre d'Études de Recherche Opérationnelle, 267 Avenue Molière, Bruxelles, Belgium. Inquiries should be addressed to M. P. P. Gillis, Président du Centre. The subscription fee is 200 francs per year (four issues).

FOURTEENTH ANNUAL MEETING OF THE ASSOCIATION FOR COMPUTING MACHINERY

The Fourteenth Annual Meeting of the Association for Computing Machinery will be held at the Massachusetts Institute of Technology, Cambridge, Massachusetts, on September 1–3, 1959. Local arrangements will be under the direction of Prof. F. M. Verzuh, Massachusetts Institute of Technology.

ROYAL STATISTICAL SOCIETY CONFERENCE

The Industrial Applications Section and the Research Section of the Royal Statistical Society, will hold a joint Conference at Loughborough College of Technology during the weekend September 11–13, 1959. For further information contact C. J. Anson, Department of Mathematics, City of Birmingham College of Technology, Gosta Green, Birmingham 4, England.

DOCTORAL DISSERTATIONS IN STATISTICS, 1958

Listed below are doctorates conferred during the year 1958 in the United States and Canada for which the dissertations were written on topics in statistics or related fields. The university, major subject (when available), and the title of the dissertation are given in each case. Readers are invited to notify the Editor of any omissions from this list.

Mohamed S. Ahmed, University of California, Berkeley, major in statistics, "On a locally most powerful similar test for the independence of two Poisson variables."

Harvey J. Arnold, Princeton University, major in mathematical statistics, "Permutation support for multivariate techniques."

W. O. Ash, Virginia Polytechnic Institute, "Randomized estimates in power spectral analysis."

B. J. Attebery, University of Missouri, "Some asymptotic properties of a maximum likelihood estimator."

Ishverlal S. Bangdiwala, North Carolina State College, major in statistics, "Some sequential procedures for ordering populations according to means, variances and regression coefficients."

Rolf E. Bargmann, University of North Carolina, major in statistics, "A study of independence and dependence in multivariate normal analysis."

Joseph Blum, George Washington University, major in mathematics, "Banach space functions and matrix summability methods."

Leroy S. Brenna, Virginia Polytechnic Institute, major in statistics, "Factorial treatments in lattice designs."

Marion Ritchie Bryson, Iowa State College, major in statistics, "Analysis of farm and home development Benchmark survey results and associated statistical problems."

Jacob Chassan, George Washington University, "Probability and the state of mind."

Yuan Shih Chow, University of Illinois, major in mathematics, "The theory of martingales in an S-finite measure space indexed by directed sets."

Leonard Cohen, Columbia University, "On mixed single sample experiments."

Morris H. DeGroot, University of Chicago, major in statistics, "Unbiased sequential estimation of a probability."

E. J. Delate, University of Buffalo, "The power of a statistical test based on the mean successive difference."

Earl Louis Diamond, University of North Carolina, major in statistics, "Asymptotic power and independence of certain classes of tests on categorical data."

Normal Richard Draper, University of North Carolina, major in statistics, "Investigation of response surface designs."

John Leroy Folks, Iowa State College, major in statistics, "Comparison of designs for exploration of response relationships."

A. E. Garrett, Virginia Polytechnic Institute, "Estimation problems connected with stochastic processes."

J. J. Gart, Virginia Polytechnic Institute, "Some problems in statistical inference."

Edgar John Gilbert, University of California, Berkeley, major in statistics, "The identifiability problem for functions of a finite Markov chain."

Donald Guthrie, Jr., Stanford University, major in statistics, "Bayes acceptance sampling procedures for large lots."

Bernard Harris, Stanford University, major in statistics, "Determining bounds on integrals with applications to cataloging problems."

Wei-Chung Ho (Mrs.), Harvard University, major in statistics, "Higher order factors in factor analysis."

Jean-Pierre Imhof, University of California, Berkeley, major in statistics, "Contributions to the theory of mixed models for the analysis of variance."

A. Joffe, Cornell University, major in mathematics, "Sojourn time for stable processes."

W. M. Kahan, University of Toronto, "Causs-Seidel methods of solving large systems of linear equations."

Harry Kesten, Cornell University, "Symmetric random walks on groups."

Ken-ichi Kojima, North Carolina State College, major in statistics, "An analysis of genetic systems in which the phenotype depends upon deviations from an optimum."

John Clement Koop, North Carolina State College, major in statistics, "Contributions to the general theory of sampling finite populations without replacement and with unequal probabilities."

Lambert Herman Koopmans, University of California, Berkeley, major in statistics, "Asymptotic rate of discrimination for Markov processes."

K. S. Kretschmer, Carnegie Institute of Technology, "Linear programming in locally convex spaces and its use in analysis."

Roy Raymond Kuebler, Jr., University of North Carolina, Statistics, "The construction of error-detecting and error-correcting codes."

Lonnie Louis Lasman, North Carolina State College, major in statistics, "Asymptotic distribution of sample size for certain methods of sequential sampling."

Leo Lynch, Virginia Polytechnic Institute, "The analysis of paired ranked observations."

Albert Madansky, University of Chicago, major in statistics, "Identification and estimation in latent class analysis."

Albert W. Marshall, University of Washington, major in mathematics, "On the growth of stochastic processes."

Kochettu Kuruvilla Mathen, Johns Hopkins University, major in biostatistics, "Attribute matching in comparison studies in public health."

Harlley E. McKean, Purdue University, major in mathematical statistics, "Utilization of chromosomes in quantitative inheritance."

Rupert Griel Miller, Jr., Stanford University, major in statistics, "A contribution to the theory of bulk queues."

Cristina Parel, University of Michigan, "A matrix derivation of generalized least squares linear regression with all variables subject to error."

R. N. Pendergrass, Virginia Polytechnic Institute, "The rank analysis of triple comparisons."

R. R. Read, University of California, Berkeley, "Contributions to the statistical theory of cloud-chamber data."

R. H. Riffenburgh, Virginia Polytechnic Institute, "Linear discriminant analysis."

Gerald S. Rogers, State University of Iowa, major in mathematical statistics, "On statistics whose distributions depend upon a parameter."

Basilio Alfonso Rojas, Iowa State College, major in statistics, "The analyses of groups of similar experiments."

Frank Salvatore Scalora, University of Illinois, major in mathematics, "Abstract martingale convergence theorems."

W. E. Smith, University of California, Los Angeles, "On posteriori probabilities."

Thomas H. Starks, Virginia Polytechnic Institute, major in statistics, "Significance tests in experiments involving paired comparisons."

K. R. Stronberg, University of Washington, "Probabilities on a compact group."

Howard Lewis Taylor, Iowa State College, major in statistics, "Statistical sampling for soil mapping surveys."

Ronald E. Walpole, Virginia Polytechnic Institute, major in statistics, "Combined intra- and inter-block analysis for factorials in incomplete block designs."

Alvin Dennie Wiggins, University of California, Berkeley, major in statistics, "A statistical study of the mechanism of bacterial toxicity."

William Howard Williams, Iowa State College, major in statistics, "Unbiased regression estimators and their efficiencies."

George Zyskind, Iowa State College, major in statistics, "Error structures in experimental designs."

The following doctorates were conferred in 1957 and omitted from the prior list:

R. G. Heyneman, University of California, Berkeley, "On uniqueness in abstract ergodic theory."

M. S. Rohatgi, University of California, Berkeley, "I. Locally unbiased tests of composite hypotheses with s constraints. II. Estimation of the location parameter based on certain order statistics. III. Distance estimates based on luminosity functions."

REPORT OF THE PITTSBURGH, PENNSYLVANIA MEETING OF THE INSTITUTE OF MATHEMATICAL STATISTICS

The 1959 Eastern Regional Meeting, eightieth meeting of the Institute of Mathematical Statistics, was held at the University of Pittsburgh, Pittsburgh, Pennsylvania, on March 19–21, 1959, in conjunction with the meetings of the Biometric Society (Eastern North American Region) and the American Statistical Association (Section on Physical and Engineering Sciences).

There were 154 members of the Institute registered for the meeting. The program of the meeting was as follows:

THURSDAY, MARCH 19, 1959

9:45–10:00 a.m. Welcome to the Societies, Chairman: DONOVAN THOMPSON, University of Pittsburgh.

Welcoming Remarks, EDMUND R. McCLUSKEY, Vice Chancellor of the University of Pittsburgh.

10:00–12:00 a.m. Bioassays

Chairman: JEROME CORNFIELD, Johns Hopkins University.

1. *Polychotamous Quantal Responses in Biological Assay*, JOHN GURLAND AND ILBOK LEE, Iowa State College.
2. *The Statistical Evaluation of a Biological Assay for Antiemetic Drugs*, J. L. CIMINERA, C. A. STONE AND J. IPSEN, Merck, Sharpe and Dohme Co. and Massachusetts Dept. of Health.
3. *Some Techniques for Increasing Assay Precision*, GORDON THOMAS, Schering Corp.

Discussant: J. O. IRWIN, University of North Carolina.

10:00–12:30 p.m. Contributed Papers (Extra Session-IMS)

Chairman: P. B. BULLOCK, U. S. Steel Corporation.

1. *Mathematical Problems Associated with Measurements Made by Matching with Known Standards*, W. S. CONNOR AND N. C. SEVERO, National Bureau of Standards.
2. *The First and Second Moment Structure of the Maximum Likelihood Estimators of the Parameters of a Multi-variate Normal Distribution with Double Samples*, JACK NADLER, Bell Telephone Laboratories.
3. *Some Properties of Stirling's Numbers of the Second Kind*, JOHN L. BAGG, Florida State University.
4. *Minimax Solutions to Trichotomies*, LONNIE L. LASMAN, Florida State University.
5. *The Distribution of the Number of Successes in a Sequence of Dependent Trials*, K. R. GABRIEL, University of North Carolina.
6. *Values of Games with Moves in (0, 1)*, MARTIN FOX, University of California.
7. *Explicit Results for the Dam with Poisson Input*, JOSEPH M. GANI, Columbia University, N. U. PRABHU, Karnatak University.
8. *Some Stochastic Processes with Application to Counter Models*, RONALD PYKE, Columbia University.
9. *Use of Series Expansion in Estimation Problems for Distributions Involving more than One Parameter* (Preliminary Report) Y. S. SATHE, University of Alberta (By title).

1:30–3:30 p.m. Session of Mixed Topics

Chairman: ROGER PINKHAM, Princeton University.

1. *Little Pieces of Mixed Factorials*, JOHN W. TUKEY, Princeton University and Bell Telephone Laboratories.
2. *Zeros and Ties in the Wilcoxon Signed Rank Test*, JOHN PRATT, Harvard University.
3. *The Significant Separation of Two Small Samples on Many Variables*, A. P. DEMPSTER, Harvard University.
4. *Rejection of Outliers*, F. J. ANSCOMBE, Princeton University.

2:00–3:30 p.m. Analysis of Experimental Data, I

Chairman: D. B. DUNCAN, University of North Carolina.

1. *A Note on the Analysis of Transformed Data*, R. E. BARGMANN, Virginia Polytechnic Institute.
2. *A New Application of the Logistic Model to Analyzing a Factorial Design When the Data Are Proportions*, J. E. GRIZZLE, University of North Carolina.
3. *Analysis of Experiments Measuring Threshold Tests*, E. K. HARRIS, Public Health Service.

3:45–5:45 p.m. Contributed Papers I (IMS)

Chairman: J. D. HROMI, U. S. Steel Corporation.

1. *A Method of Multiple Presentation Scaling by Successive Intervals*, MARY B. Mc-GAHAY, Thiokol Corporation and Virginia Polytechnic Institute.

2. *Comparison of the Effectiveness of Tournaments*, W. A. GLENN, Virginia Polytechnic Institute.

3. *The Comparison of the Sensitivities of Similar Experiments: Model II of the Analysis of Variance*, D. E. W. SCHUMANN, University of Stellenbosch, AND R. A. BRADLEY, Virginia Polytechnic Institute.

4. *Application of the Geometry of Quadrics in Finite Projective Space to the Construction of PBIB Designs*, R. C. BOSE AND D. K. RAY-CHAUDHURI, University of North Carolina.

5. *On the Construction of Sets of Pairwise Orthogonal Latin Squares*, S. S. SHRIKHANDE AND R. C. BOSE, University of North Carolina.

6. *A Necessary Condition for Existence of a Regular and Symmetrical P.B.I.B. Design of Triangular Type*, J. OGAWA, University of North Carolina.

7. *Use of Partially Balanced Block Designs with Three Associate Classes for Confounded, Asymmetrical Factorial Arrangements* (Preliminary Report), BADRIG M. KURKJIAN, Diamond Ordinance Fuze Laboratories (By title).

8. *Some New Cases of the Packing Problem in Finite Projective Space with Applications to Fractionally Replicated Designs*, R. C. BOSE, University of North Carolina (By title).

3:45–5:45 p.m. Sampling and Survey Techniques—Theory and Practices

Chairman: VIRGIL ANDERSON, Purdue University.
1. *The Present State of the Art*, DONOVAN J. THOMPSON, University of Pittsburgh.
2. *Current Research Problems*, ALAN ROSS, University of Kentucky.
3. *Present Status of Application of the Theory*, HAROLD NISSELSON, Bureau of the Census.
4. *Question and Discussion Period*.

8:00 p.m.

Chairman: C. I. BLISS, Connecticut Agricultural Experiment Station.
  Biometrics Methods: Past, Present and Future, J. O. IRWIN, University of North Carolina.

FRIDAY, MARCH 20, 1959

9:00–10:30 a.m. Tests of Significance

Chairman: W. T. FEDERER, Cornell University.
1. *A Family of Truncated Sequential Tests*, T. G. DONNELLY, University of North Carolina.
2. *Significance Testing in Paired Comparisons*, T. H. STARKS, Virginia Polytechnic Institute and DuPont, AND H. A. DAVID, Virginia Polytechnic Institute.
3. *A Test of the Exponential Distribution,* CHARLES H. CLUNIES-ROSS, Virginia Polytechnic Institute.

10:30–12:30 p.m. Theoretical Developments in Mathematical Statistics

Chairman: ROBERT HOOKE, Westinghouse Research Laboratories.
1. *Generalized Maximum Likelihood; Non-asymptotic Justification and Applications*, ALLAN BIRNBAUM, Columbia University.
2. *Some New Results on the Bivariate Normal Integral*, HAROLD RUBIN, Columbia University.
3. *Dispersion on the Sphere*, GEOFFREY S. WATSON, Princeton University.

11:00–12:30 p.m. Uses of Statistical Methods in Epidemiology

Chairman: F. M. HEMPHILL, University of Michigan.
1. *Statistical Methodology in Retrospective Studies*, NATHAN MANTEL, National Institutes of Health (Read by WILLIAM HAENSTEL, National Institutes of Health).
2. *Epidemiological Methods and Inferences*, ABRAHAM M. LILIENFELD, Johns Hopkins University.
3. *On Follow-up for Survival in the Presence of Movement*, D. J. THOMPSON AND D. KODLIN, University of Pittsburgh (Presented by D. KODLIN).

2:00–3:30 p.m. Uses of Life Table Analysis in Health Research

Chairman: DONOVAN J. THOMPSON, University of Pittsburgh.
1. *The Analysis of Long Term Survival Experience in Humans*, SIDNEY J. CULTER, National Institutes of Health.
2. *A Rapid Method for Estimating the Standard Error of the Survival Rate*, FRED EDERER.
Discussant: ABRAHAM M. LILIENFELD, Johns Hopkins University.

2:00–3:30 p.m. Contributed Papers II (IMS)

Chairman: WILLARD CLATWORTHY, Westinghouse Electric Corp.
1. *Best Linear Estimates by Order Statistics of the Parameters of a Model for Failure Data*, ANDRE G. LAURENT AND ELDON RIEHM, Wayne State University.
2. *On Testability in Normal ANOVA and MANOVA with All 'Fixed Effects'*, S. N. ROY AND J. ROY, University of North Carolina and Indian Statistical Institute, Calcutta.
3. *Contributions to Univariate and Multivariate Analysis of Variance with 'Fixed Effects', Normal Error and 'Random Effects' not Necessarily Normal*, S. N. ROY AND WHITFIELD COBB, University of North Carolina.
4. *Some Nonparametric Analogues of 'Normal' ANOVA and MANOVA and of Studies in 'Normal' Association*, S. N. ROY AND V. P. BHAPKAR, University of North Carolina.
5. *On Moments of Order Statistics from Normal Populations*, Z. GOVINDARAJULU, University of Minnesota (By title).
6. *A Note on J. Roy's Step-Down Procedure in Multivariate Analysis*, V. P. BHAPKAR, University of North Carolina (By title).
7. *On a Class of Problems in Multivariate Analysis of Variance*, S. N. ROY AND J. ROY, University of North Carolina and Indian Statistical Institute, Calcutta (By title).
8. *A Note on Confidence Bounds Connected with ANOVA and MANOVA for Balanced and Partially Balanced Incomplete Block Designs*, V. P. Bhapkar, University of North Carolina (By title).

3:30–5:00 p.m. Contributed Papers III (IMS)

Chairman: ROBERT L. BRICKLEY, Westinghouse Electric Corp.
1. *Sufficient Partitions for a Class of Coin Tossing Problems* (Preliminary Report), T. V. NARAYANA, University of Alberta.
2. *Estimation of the Mean and Variance of Quantitative Characteristics in a Polygenic System*, ALLAN G. ANDERSON, Western Kentucky State College.
3. *Selecting a Subset Containing the Best of Several Binomial Populations*, S. S. GUPTA AND M. SOBEL, Bell Telephone Laboratories, Inc., Allentown, Pennsylvania.
4. *Hadamard Matrices and a Problem in the Theory of Code Construction*, R. C. BOSE AND S. S. SHRIKHANDE, University of North Carolina.
5. *Modified Neyman-Pearson Methods which Avoid 'Paradoxes' and Tend to Coincide with Other Methods*, ALLAN BIRNBAUM, Columbia University.

6. *Hypothesis Tests on the Population Lower Limit*, PHILLIP G. CARLSON, Arthur Andersen and Co. (Introduced by S. B. LITTAUER) (By title).
7. *Truncation and Tests of Hypotheses II*, IRWIN GUTTMAN, McGill University and Princeton University (By title).

8:30 p.m. Random Balance Experiments

Chairman: WILLIAM G. COCHRAN, Harvard University.
1. *Random Balance Experimentation*, F. E. SATTERTHWAITE, Merrimack College.
2. *The Application of Random Balance Designs*, T. A. BUDNE, Consultant, Great Neck, Long Island.
Discussants: OSCAR KEMPTHORNE, Iowa State College; W. J. YOUDEN, National Bureau of Standards; J. W. TUKEY, Princeton University and Bell Telephone Laboratories, Murray Hill, New Jersey; F. J. ANSCOMBE, Princeton University.

SATURDAY, MARCH 21, 1959

8:30–9:30 a.m. Analysis of Experimental Data II

Chairman: W. H. HORTON, Westinghouse Electric Corp.
1. *The Role of Treatment Error in Comparative Experiments*, GEORGE ZYSKIND, University of North Carolina.
2. *Factorials and Lattices*, L. S. BRENNA, Texas Company and Virginia Polytechnic Institute, AND C. Y. KRAMER, Virginia Polytechnic Institute.

9:45–10:45 a.m. Multiple Comparisons and Confidence Intervals

Chairman: JOHN GURLAND, Iowa State College.
1. *A Simple Minimum Average Risk Procedure for the Multiple Comparisons Problem*, D. B. DUNCAN, University of North Carolina.
2. *Asymptotic Simultaneous Confidence Intervals for the Probabilities of a Multinomial Distribution*, C. P. QUESENBERRY, Virginia Polytechnic Institute, AND D. C. HURST, Virginia Polytechnic Institute.

11:00–12:30 p.m. Special Topics

Chairman: BOYD HARSHBARGER, Virginia Polytechnic Institute.
1. *Priorities in Waiting Lines*, DONALD E. GAVER, Westinghouse Electric Corp.
2. *Life Distribution of Systems with Spare Components*, D. E. MORRISON, National Institute of Mental Health AND H. A. DAVID, Virginia Polytechnic Institute.
3. *Geometrical Methods in the Construction of Group Alphabets*, R. C. BOSE, University of North Carolina AND R. R. KUEBLER, JR., University of North Carolina.

DOROTHY M. GILFORD
Associate Secretary

REPORT OF THE CLEVELAND, OHIO MEETING OF THE INSTITUTE OF MATHEMATICAL STATISTICS

The eighty-first meeting of The Institute of Mathematical Statistics was held at the Case Institute of Technology, Cleveland, Ohio on April 2–4, 1959, jointly with the meetings of the Association for Computing Machines. One hundred and thirty-nine people registered for the meetings. Registration, an informal recep-

tion and a banquet were held in Tomlinson Hall and all technical sessions convened in the Strosacker Auditorium, both on the Case campus. The appointed officers for the meeting were Program Coordinator, M. B. WILK, Bell Telephone Laboratories; Associate Secretary, J. SILBER, Roosevelt University; Assistant Secretary, F. C. LEONE, Case Institute of Technology; Program Chairman, F. A. GRAYBILL, Oklahoma State University.

The program was as follows:

THURSDAY, APRIL 2, 1959

9:45–10:00 a.m. Welcome from Case Institute of Technology

10:00–11:45 a.m. Invited Papers on Codes and Programs for High Speed Computers, Joint with A.C.M.

Chairman: BAYARD RANKIN, Case Institute of Technology.
1. *Statistical Programs for the IBM-650*, JOHN HAMBLEN, University of Kentucky.
2. *Applying Compilers to Statistics*, GEORGE HAYNAM, Case Institute of Technology.
3. *Computers, Algebra, and Design of Experiment*, HARRY M. HUGHES, School of Aviation Medicine.

1:30–2:45 p.m. Invited Papers on Estimation and Testing Hypotheses

Chairman: IRVING W. BURR, Purdue University.
1. *Maximum Likelihood Estimation of the Parameters of the Beta Function*, H. O. HARTLEY, Iowa State College. Presented by J. A. GREENWOOD, Iowa State College.
2. *Testing Approximate Hypotheses*, JUDAH ROSENBLATT, Purdue University.

3:00–5:00 p.m. Invited Papers on Computing Procedure for Statistical Problems, Joint meeting with A.C.M.

Chairman: J. TESTERMAN, Jersey Production Research.
1. *Activities of the Committee on Mathematical Tables of the Institute of Mathematical Statistics, with Some Suggestions on Statistical Tables that need Computing*, D. B. OWEN, Sandia Corporation.
2. *An Iterative Least Squares Procedure for Fitting the Sum of a Gaussian and Exponential to Absorption Spectra*, DONALD A. GARDINER AND SUSIE E. ATTA, Oak Ridge National Laboratory.
3. *Computation and Use of Tables of Range and Studentized Range*, H. LEON HARTER, Wright-Patterson Air Force Base.

FRIDAY, APRIL 3, 1959

9:00–10:20 a.m. Invited Papers on Distribution-free Models

Chairman: PAUL RIDER, Wright-Patterson Air Force Base.
1. *Error Structures for the Analysis of Variance*, GEORGE ZYSKIND, Iowa State College and University of North Carolina.
2. *A Method for Determining Distribution-free Tolerance Regions, with Application to the Weibull Distribution*, JAMES H. STAPLETON, Michigan State University.

10:30–12:00 a.m. Contributed Papers

Chairman: J. SILBER, Roosevelt University.
1. *Relation Between Certain Incomplete Block Design*, S. S. SHRIKHANDE, University of North Carolina (By title).

2. *Quasi-ranges of Samples from an Exponential Distribution*, P. R. RIDER, Wright Air Development Center.

3. *Asymptotic Rate of Discrimination for Markov Processes*, L. H. KOOPMANS, Sandia Corporation.

4. *Distribution of a Quadratic Form in Three Variables*, A. G. LAURENT, Wayne State University.

5. *On Exponentially-Mapped-Past Statistical Variables* (Preliminary Report), J. OTTERMAN, The University of Michigan, introduced by the Chairman.

6. *Simultaneous Comparison of the Optimun and Sign Tests of a Normal Mean*, R. R. BAHADUR, Indian Statistical Institute, Calcutta (By title).

7. *Some Estimates of the Binomial Distribution Function*, R. R. BAHADUR, Indian Statistical Institute (By title).

8. *Distribution-free and Non Parametric Tolerance Regions: The Exponential Case* (Preliminary Report), L. A. GOODMAN, The University of Chicago, AND A. MADANSKY, The Rand Corporation, (By title).

9. *Bayesian Lot-by-Lot Sampling Inspection*, H. B. EISENBERG, Iowa State College (By title).

10. *Combining Inter-Block and Intra-Block Information in Balanced Incomplete Block Designs*, F. A. GRAYBILL AND D. L. WEEKS, Oklahoma State University (By title).

11. *Minimal Sufficient Statistics in Incomplete Block Designs, Model II*, D. L. WEEKS AND F. A. GRAYBILL, Oklahoma State University (By title).

12. *Some Theorems Concerning Eisenhart's Model II*, F. A. GRAYBILL AND R. HULTQUIST, Oklahoma State University (By title).

2:00–3:20 p.m. Invited Papers on Markov Processes and Random Sequences

Chairman: PAUL MINTON, Southern Methodist University.

1. *Some Problems on the Consolidation of States of a Markov Process*, MURRAY ROSENBLATT, Indiana University.

2. *The Serial and Gap Tests for Random Sequences*, EVE BOFINGER AND V. J. BOFINGER, Institute of Statistics, North Carolina State College.

SATURDAY, APRIL 4, 1959

9:00–10:30 a.m. Invited Papers on Statistical Procedures which depend on High Speed Computers. Joint meeting with A.C.M.

Chairman: FRED C. LEONE, Case Institute of Technology.

1. *The Reciprocal Impact Between Statistics and Computers*, JACK MOSHMAN, Corporation for Economic and Industrial Research.

2. *Non-linear Estimation Procedures and Sampling Designs Procedures*, MERVIN MULLER, Princeton University, and IBM.

J. SILBER
Associate Secretary

PUBLICATIONS RECEIVED

ARROW, K. I., HURWICZ, LEONID, AND UZAWA, HIROFUMI, *Studies in Linear and Non-linear Programming*; Stanford University Press, Stanford, California; December, 1958, $7.50, 229 pp.

COGAN, E. J., KEMENY, J. G., NORMAN, R. Z., SNELL, J. L., THOMPSON, G. L., *Modern Mathematical Methods and Models, Volume II* (A Book of Experimental Test Materials),