

variables. The distribution function, $Pr \left\{ \max_{1 \leq i \leq n} (a_i - X_i) \leq x \right\}$, is obtained for all $a, x \in R_1$. For $a = 1/n$, this reduces to the distribution function of D_n^+ (cf. Birnbaum and Tingey, A.M.S., Vol. 22). Utilizing this result, $\sigma(x, T)$ is obtained explicitly. Applications of these expressions to queuing theory and distribution-free statistics are given.

10. On the Distributions of Various Sums of Squares in an Analysis of Variance Table for Different Classifications With Correlated and Non-homogeneous Errors. B. R. BHAT, Karnatak University. (Preliminary Report) (By Title)

The distributions of various sums of squares in an analysis of variance table for two way classification have been obtained by Box (Ann. Math. Stat., Vol. 25, pp. 484-498) under the assumption that the vectors $X_{.j}$ for $j = 1, 2, \dots, q$ are independent vector observations from a p -variate normal population with mean μ and covariance matrix Σ . The vector $X_{.j}$ for each j th level of the factor B denotes p observations corresponding to the p levels of the other factor A . This paper gives the distributions of the various sums of squares for any n -way classification under similar normality assumptions. It is noted that these distributions, in general, follow a simple pattern and so is their mutual dependence. For $n = 3$, if we have a third factor C at r levels in addition to the above factors A and B and if we assume that $X_{.k}$ for $k = 1, 2, \dots, r$ are independent vector observations from a pq -variate normal population, then, according to the general pattern the first set consists of distributions of the sums of squares for the correction term, main effects A and B and their interaction AB . The second set (the only remaining set) consists of the distributions of the sums of squares for the remaining main factor C and its interactions with the effects in the first set. Any two distributions, not belonging to the same set are independent, whereas, the distributions in the same set are mutually dependent. (Received May 10, 1957)

NEWS AND NOTICES

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

Personal Items

During 1957-58 T. W. Anderson will be a Fellow at the Center for Advanced Study in the Behavioral Sciences in Stanford, California.

Dr. Robert S. Aries is now Chairman of the Board of Aries Associates, whose offices for general consultation were recently transferred to 77 South Street, Stamford, Connecticut.

John Bailey has recently joined the staff of the Waltham Laboratories of Sylvania Electric Products, Inc., as an Engineer in their Applied Engineering Department.

Colin R. Blyth, on leave from the University of Illinois, will be at Stanford University for the academic year of 1957-58.

John V. Breakwell has taken a position as Staff Scientist with the Lockheed Missile Systems Division in Palo Alto.

D. M. Brown is now studying for the degree of Ph.D. in statistics at Princeton University on a RAND Corporation Fellowship.

Charles R. Carr has joined the research staff of The RAND Corporation at Santa Monica, California.

Richard L. Carter has received his Ph.D. degree in statistics from the University of North Carolina and has been appointed Associate Professor of Industrial Engineering at the Illinois Institute of Technology.

Jonas M. Dalton completed his work for his Master's degree in statistics at Virginia Polytechnic Institute in June, 1957. He is now employed at the Bell Telephone Laboratories, Murray Hill, New Jersey.

Morris H. De Groot has been appointed Assistant Professor in the Department of Mathematics at Carnegie Institute of Technology.

R. F. Drenick has joined the Bell Telephone Laboratories as a member of its technical staff.

Joseph Dubay is now an instructor in the Mathematics Department of the University of Oregon.

Professor Benjamin Epstein of Wayne State University is on leave at the Department of Statistics, Stanford University.

L. A. Gardner, Jr., has resigned his position as research scientist at Columbia University's Hudson Laboratories and is now employed as staff mathematician at M.I.T. Lincoln Laboratory.

John J. Gart is now a graduate fellow at the Oak Ridge Institute of Nuclear Studies, continuing work there toward a Ph.D. in statistics from V.P.I.

David W. Gaylor has resigned from the Nuclear Aircraft Research Facility, Convair, Ft. Worth, to work toward a Ph.D. in experimental statistics at North Carolina State College.

R. Gnanadesikan is now working with the Statistics Group at the Proctor and Gamble Company at Cincinnati, Ohio.

William A. Golomski, formerly Assistant Professor of Mathematics at Marquette University, is now in charge of operations research for Oscar Mayer and Company, Inc., Madison, Wisconsin.

Roe Goodman has gone from Santiago, Chile, where he was F.A.O. agricultural statistician, to Karachi, Pakistan, where he is now sampling statistician under the I.C.A. program of the U. S. Government in that country.

Ulf Grenander has accepted an appointment as Professor of Mathematical Statistics at Brown University.

Irwin Guttman is on leave of absence from the University of Alberta and will spend the academic year of 1957-58 as a Research Associate in the Department of Mathematics, Statistical Section, of Princeton University.

Following completion of assignment for Remington Rand International (installation of UNIVAC I at European Computing Center, Frankfurt/Main, Germany), Dr. Carl Hammer has accepted a similar position with Sylvania Electric Products, Inc., at their Waltham Laboratories.

Gordon M. Harrington has left his position as consultant in research, Connecticut State Department of Education, to become Associate Professor of Psychology and Department Chairman at Wilmington College, Wilmington, Ohio.

Dr. Theodore W. Horner, formerly of the Statistical Laboratory, Iowa State College, is now an Operations Research Analyst with General Mills, Inc., Minneapolis, Minnesota.

Patricia A. Inman received her M. A. in mathematics at U.C.L.A. in August, 1957, and has accepted a position as Computing Engineer at Atomics International, Canoga Park, California.

James Edward Jackson has taken a leave of absence from the Eastman Kodak Company to work on a doctorate at V.P.I. in Blacksburg, Virginia.

Trinidad J. Jaramillo is now working with System Research, University of Chicago, as Senior Research Engineer.

Peter W. M. John has accepted a position as research statistician with the California Research Corporation at Richmond, California.

Andre G. Laurent, formerly with the Department of Statistics of Michigan State University, has accepted an appointment as Associate Professor in the Department of Mathematics of Wayne State University.

J. Walter Lynch has moved from Huntsville, Alabama, to 101-L Rodman Road, Aberdeen, Maryland.

Albert Madansky has been employed by the Mathematics Division, The RAND Corporation, Santa Monica, California.

B. Mandelbrot, formerly of the University of Geneva, has accepted an appointment in the University of Lille.

Mr. C. L. Marcus has returned to the University of Illinois to complete his studies for a Ph.D. in statistics. He also holds an Assistantship in the Mathematics Department and a Fellowship from Armour Research.

Dr. H. P. Mulholland has been appointed to a Senior Lectureship in Mathematics in the University of Exeter.

Peter Newman has taken a post as Lecturer in Economics University College of the West Indies, Mona, St. Andrew, Jamaica, B.W.I.

Dr. Bernard Ostle, formerly Professor of Mathematics and Director of the Statistical Laboratory at Montana State College, is now with the Reliability Department of Sandia Corporation, Albuquerque, New Mexico.

Dr. Raymond P. Peterson has accepted a position as Mathematical Statistician with the Research Department, Matson Navigation Company, San Francisco, California.

Paul H. Randolph has resigned his position as Assistant Professor of Industrial Engineering at Illinois Institute of Technology to accept a position as Associate Professor of Industrial Engineering at Purdue University.

Dr. George J. Resnikoff, formerly Research Associate at the Applied Mathematics and Statistics Laboratory, Stanford University, has joined the Industrial Engineering Department of the Illinois Institute of Technology as Associate Professor.

Robert H. Riffenburgh received his Ph.D. degree in statistics at the Virginia Polytechnic Institute and is now Assistant Professor of Mathematics at the University of Hawaii, Honolulu.

Joseph Rosenbaum has resigned his position as Associate Mathematician, Systems Development Division, The RAND Corporation, and is presently employed as statistician, Broadview Research Corporation, Burlingame, California.

Dr. Jagdish S. Rustagi is an Assistant Professor in the Department of Statistics at Michigan State University, East Lansing, Michigan, for the current academic year.

Melvin E. Salvesson has formed the Council for Advanced Management together with Herbert Holt, M.D., and is offering services for research in management and management education.

Dr. M. M. Siddiqui, who obtained his doctorate degree from the University of North Carolina in June, 1957, is now working for a temporary period with the Boulder Laboratories of the National Bureau of Standards in the capacity of Mathematical Statistician.

Professor Jack Wilber has returned to Roosevelt University after spending four months as Consultant to the Operations Analysis Office at the Air Force Missile Test Center.

Morris Skibinsky has returned to the Statistical Laboratory at Purdue after a year's leave of absence at Michigan State University.

James H. Stapleton received his Ph.D. degree in mathematical statistics from Purdue University in June, 1957, and is now a statistical consultant in the statistical methods section of General Electric's General Engineering Laboratory in Schenectady, New York.

Daniel Teichroew has joined the Graduate School of Business at Stanford University as Associate Professor of Management.

James E. Thompson has returned to his job as mathematician with the Defense Department, having completed a year of graduate study with the Department of Statistics at Stanford University on a Defense Department fellowship.

W. A. Thompson, Jr., has left the U. S. Air Defense Board and has accepted an academic position at the University of Delaware.

Dr. Fred H. Tingey, mathematician, has been appointed by TECHNICAL OPERATIONS, INCORPORATED, as Assistant Chairman of Experiment Planning and Execution, Dr. Ian W. Tervet, Director of the research and development firm's West Coast office, announced today. Dr. Tingey received his masters and doctoral degrees in Mathematics and Mathematical Statistics at the University of Washington. He graduated from Utah State College in 1947. In his new position, Dr. Tingey will plan and direct field experiments conducted by TECHNICAL OPERATIONS in conjunction with the Combat Development Experimentation Center (CDEC) at Fort Ord, California.

John A. Tischendorf, having completed two years of active duty with the Commissioned Corps, U. S. Public Health Service, has joined the staff of the Allentown Laboratory of Bell Telephone Laboratories, Inc.

Joseph B. Tysver, formerly an Associate Research Engineer at the University of Michigan, received his Ph. D. degree from that University in June, 1957.

and has accepted a position as Research Specialist in the Pilotless Aircraft Division of Boeing Airplane Company, Seattle, Washington.

Dr. John S. White has accepted a position as statistician with the Aero Division of Minneapolis-Honeywell Regulator Company.

Robert A. Wijsman is now Assistant Professor in the statistics group of the Department of Mathematics at the University of Illinois.

New Members

The following persons have been elected to membership in The Institute

August 7, 1957, to November 1, 1957

- Abraham, T. C.**, M. Sc. (Karnatak Univ., India), Teaching Fellow, Boston University Graduate School, Boston University, Boston 15, Massachusetts; *627 Commonwealth Ave., Boston 15, Mass.*
- Albert, Arthur E.**, M. S. (Stanford Univ.), Student, Department of Statistics, Stanford University, Stanford, California; *20 Russell Ave., Portola Valley, Calif.*
- Ali, Asghar, M. A.** (Univ. of North Carolina), Lecturer in Statistics, *Institute of Statistics, University of the Panjal, Lahore, Pakistan.*
- Anglin, Ernie LaRue**, B. S. (Univ. of Georgia), Student, *Department of Mathematics, University of Georgia, Athens, Georgia.*
- Beatty, Richard L.**, M. S. (Univ. of Colorado), *Instructor in Statistics, University of Wyoming, Laramie, Wyoming.*
- Bland, Richard P.**, B. S. (Univ. of Oklahoma), Student, Department of Statistics, University of North Carolina, Chapel Hill, North Carolina; *1 Audley Lane, Chapel Hill, N. C.*
- Bobotek, Henry G.**, M. A. (Univ. of Illinois), Research Associate, *Control Systems Laboratory, University of Illinois, Urbana, Illinois.*
- Bogdanoff, J. L.**, Ph. D. (Columbia Univ.), *Professor of Engineering Sciences, Purdue University, Lafayette, Indiana.*
- Calhoun, David W.**, B. A. (Yale Univ.), Biometrician, G. D. Searle and Co., P. O. Box 5110, Chicago 80, Illinois; *820 Hamlin St., Evanston, Ill.*
- Caspers, James W.**, M. S. in E. E. (Univ. of Washington), Head, Applied Theoretical Studies Group, U. S. Navy Electronics Lab., San Diego 52, California; *5014 August St., San Diego 10, Calif.*
- Champernowne, D. G.**, M. A. (Cambridge Univ.), Professor in Statistics and Fellow of Nuffield College, *Oxford University, Nuffield College, Oxford, England.*
- Chapman, James W.**, M. S. (Univ. of Minnesota), Research Assistant, *Department of Soils, Institute of Agriculture, University of Minnesota, St. Paul 1, Minnesota.*
- Clarke, Geoffrey M.**, M. A. (Oxon), Statistician, Department of Agriculture and Horticulture, National Fruit and Cider Institute, University of Bristol; *University of Bristol, Research Station, Long Ashton, Bristol, England.*
- Cotton, John W.**, Ph. D. (Indiana Univ.), Assistant Professor of Psychology, Northwestern University, Evanston, Illinois; *Department of Statistics, Eckhart Hall, University of Chicago, Chicago 37, Illinois.*
- Cox, Constance E.**, M. S. (Iowa State College), *Head, Biometrics Section, Food and Drug Directorate, Department of National Health and Welfare, Tunney's Pasture, Ottawa, Ontario, Canada.*
- Dear, Robert E.**, Ph. D. (Univ. of Washington), Research Associate, *Research Division, Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.*
- Engler, Jean**, Ph. D. (Northwestern Univ.), National Science Foundation Postdoctoral

- Fellow, *Department of Statistics, University of North Carolina, Chapel Hill, North Carolina.*
- Evans, Richard V.**, A. B. (Princeton Univ.), Student, Department of Industrial Engineering, Johns Hopkins University, Baltimore 18, Md., *Barroll Road, Baltimore 9, Md.*
- Feldt, Leonard S.**, Ph. D. (State Univ. of Iowa), Assistant Professor, *College of Education, State University of Iowa, Iowa City, Iowa.*
- Fields, Raymond I.**, M. A. (Univ. of Arizona), Student, Virginia Polytechnic Institute, Blacksburg, Virginia; *Speed Scientific School, University of Louisville, Louisville, Kentucky.*
- Figge, Harry J.**, President, *Harry J. Figge and Associates, 800 Liberty Building, Des Moines 9, Iowa.*
- Flanagan, Richard M.**, B. A. (Univ. of Michigan), Senior Programmer, *Argonaut Insurance Group, 250 Middlefield Road, Menlo Park, California.*
- Gordon, M. H.**, Ph. D. (Univ. of Tennessee), Assistant Director, Central Neuropsychiatric Research Unit, Veterans Administration Hospital, Perry Point, Maryland; *Box 546, Perry Point, Maryland.*
- Govindarajulu, Z.**, M. A. (Univ. of Madras), Graduate Student, Statistics, and Teaching Assistant, *Biostatistics Division, University of Minnesota, Minneapolis 14, Minnesota.*
- Green, Lloyd G.**, B. A. (Washington Missionary College), Mathematician, *Touche, Niven, Bailey and Smart, 1380 National Bank Building, Detroit 26, Michigan.*
- Halton, John H.**, M. A. (Oxon), Research-Student in Faculty of Physical Sciences, *Balliol College, Oxford University, Oxford, England.*
- Hancock, John V.**, B. S. (Memphis State Univ.), Research Assistant, *Department of Mathematics, University of Georgia, Athens, Georgia.*
- Harrison, Gerald**, Ph. D. (Calif. Institute of Technology), Mathematician, *The Teleregister Corp., 445 Fairfield Avenue, Stamford, Connecticut.*
- Heinhold, Josef**, Dr. rer. nat. (Technische Hochschule Munchen), Professor, *Institut fur Angewandte Mathematik, Technische Hochschule Munchen Munchen 2, NW, ArcisstraBe 21, Germany.*
- Hicks, Charles R.**, Ph. D. (Syracuse Univ.), Associate Professor of Mathematics and Research Associate in the Statistical Laboratory, *Statistical Laboratory, Engineering Administration Building, Purdue University, Lafayette, Indiana.*
- Hoyland, Arnljot**, Cand. real (Univ. of Oxlo), Research Assistant, Forsikringsteknisk Seminar, University of Oslo, Blindern pr. Oslo, Norway; *Krokvolden 20, Stabekk pr. Oslo, Norway*
- Iversen, Iver Andrew**, B. A. (Univ. of Minnesota), Teaching Assistant, University of Minnesota, Minneapolis 14, Minnesota; *420 Fifth Street S.E., Minneapolis 14, Minnesota.*
- Jacobsen, Fred M., Jr.**, Ph. D. (Iowa State College), Group Leader, Computer Programming and Mathematical Analysis, American Oil Co., Box 401, Texas City, Texas; *Box 1537, Texas City, Texas.*
- Jones, Alfred Welwood**, Ph. D. (Columbia Univ.), Systems Engineer, *Bell Telephone Laboratories, 463 West Street, New York 14, N. Y.*
- Kakeshita, Shin'ichi**, B. Sc. (Kyushu Univ.), Student, *Math. Inst., Fac. Sei., Kyushu University, Fukuoka, Japan.*
- Kim, Dong Sie**, B. S. (Seoul National Univ.), Assistant, Dept. of Mathematics, Seoul National University, Seoul, Korea; *11-44 Ka-heo-Dong, Chong-no-Ku, Seoul, Korea.*
- Knapp, Leslie E.**, B. S. and B. A. (Upper Iowa Univ.), Student, Stanford University, Stanford, California; *1255 Tucson Avenue, Sunnyvale, California.*
- Lamm, Richard A.**, M. A. (Hofstra College), Analytical Statistician, Chemical Corps R and D Command, Biological Warfare Laboratories, Fort Detrick, Frederick, Maryland; *75 Stewart Manor, Frederick, Maryland.*
- Laubscher, N. F.**, M. Sc. (Potchefstroomse Universiteit vir C.H.O.), A. Research Officer, *South African Council for Scientific and Industrial Research, National Physical Research Laboratory, P. O. Box 396, Pretoria, South Africa.*

- Lindeman, Richard H.**, M. S. (Univ. of Wisconsin), Research Fellow, Bureau of Institutional Research, University of Minnesota, Minneapolis 14, Minnesota; *4936 Penn Ave. South, Minneapolis 9, Minn.*
- Lokki, Olli Kristian**, Dr. phil. (Univ. of Helsinki), *Associated Professor, Institute of Technology, Helsinki, Finland.*
- Lunneborg, Clifford E.**, B. S. (Univ. of Washington), Research Assistant, Division of Counseling and Testing Services, University of Washington, Seattle, Washington; *5218 16th Avenue N.E., Seattle 5, Washington.*
- McGuire, Judson Ulery, Jr.**, Ph. D. (Iowa State College) Entomologist, Agricultural Research Service, U. S. Department of Agriculture, Washington, D. C.; *Apartado 654, Camaguey, Cuba.*
- Mikami, Misao**, D. Sc. (Kyushu Univ.), Professor of Industrial Statistics, *Seminar of Industrial Statistics, Faculty of Engineering, Kyushu University, Fukuoka, Japan.*
- Mitra, S. S.**, M. S. (Univ. of Calcutta), Graduate Student and Teaching Assistant, *Department of Mathematics, University of Washington, Seattle 5, Washington.*
- Miyasawa, Koichi**, D. Sc. (Kyushu Univ.), Assistant Professor of Mathematical Statistics and Econometrics, *Faculty of Economics, Tokyo University, Tokyo, Japan.*
- Pendergrass, R. N.**, M. A. (Univ. of Missouri), *Professor of Mathematics, Radford College, Radford, Virginia.*
- Pike, M. C.**, B. S. (Witwatersrand Univ., South Africa), Student, Statistical Laboratory, University of Cambridge, *Trinity Hall, Cambridge, England.*
- Redus, Faye**, B. S. (Stephen F. Austin State College), Senior Analyst and Programmer, Sutherland Co., Suite 1112, First National Bank Building, Peoria, Illinois; *434 W. 21 Street, San Bernardino, California.*
- Reed, James C.**, Ph. D. (Univ. of Chicago), *Director, Reading and Study Skills, Wayne State University, Detroit, Michigan.*
- Rice, Philip L.**, B. S. (Principia College), Chief, Tropospheric Analysis Section, Radio Propagation Engineering Division, National Bureau of Standards, Boulder, Colorado; *1103 Pine Street, Boulder, Colorado.*
- Rogerson, G. W.**, B. S. (Melbourne), Student, Melbourne University, Carlton, Melbourne N3, Victoria, Australia; *48 Drummond St., Carlton, Melbourne N3, Victoria, Australia.*
- Romano, Albert**, M. A. (Washington Univ.), Student and Research Assistant, *Dept. of Statistics, Virginia Polytechnic Institute, Blacksburg, Virginia.*
- Sagi, Philip C.**, Ph. D. (Univ. of Minnesota), Research Associate, *Office of Population Research, 5 Ivy Lane, Princeton, New Jersey.*
- Schoderbek, Joseph J.**, M. S. (Carnegie Inst. of Tech.), Research Engineer, Missile Systems Division, Lockheed Aircraft Corp., Palo Alto, California; *543 Carla Court, Mountain View, Calif.*
- Schwartz, A. J.**, B. S. (Wayne Univ.), Student, Wayne State University, Detroit, Michigan; *18478 Prest, Detroit, Michigan.*
- Shaffer, Douglas H.**, Ph. D. (Carnegie Inst. of Technology), Mathematician, *Westinghouse Research, Pittsburgh 35, Pa.*
- Sherman, Seymour**, Ph. D. (Cornell Univ.), Professor, *Moore School of Electrical Engineering, University of Pennsylvania, Philadelphia 4, Pennsylvania.*
- Singh, Rajinder**, M. A. (Panjab Univ., India), Graduate Assistant, *University of Illinois, Department of Mathematics, Urbana, Illinois.*
- Spicer, Ira G.**, B. S. (Univ. of Minnesota), Development Engineer, Project Leader of Technical Analysis, Minneapolis-Honeywell, Ordnance Engineering, Hopkins, Minnesota; *1928 Emerson Ave. So., Apt. 1-D, Minneapolis 5, Minnesota.*
- Trammell, Carol D.**, B. S. (Carnegie Inst. of Tech.), Graduate Student and Teaching Assistant, *Department of Mathematics, Carnegie Institute of Technology, Pittsburgh 13, Pennsylvania.*
- Weiler, H.**, M. S. (N.S.W. Univ. of Technology), Research Officer, *CSIRO, Sheep Biology Laboratory, P. O. Box 144, Paramatta, N.S.W., Australia.*

Woods, W. Max, M. S. (Oregon Univ.), Student, Stanford University, Stanford, California; *1919 Manhattan Ave., Apt. 4, East Palo Alto, California.*

Youtcheff, John S., A. B. (Columbia Univ.), Operations Analyst, General Electric Company, Missile and Ordnance Systems Dept., Philadelphia, Pennsylvania; *Post Office Box 155, Berwyn, Pennsylvania.*

Congratulations to the Office of Naval Research

At the request of the Council, the President of the Institute of Mathematical Statistics has written a congratulatory letter to Admiral Bennett of the Office of Naval Research in connection with the tenth anniversary of the Office of Naval Research. The text of the letter follows.

Dear Admiral Bennett:

At the recent annual meeting of the Institute of Mathematical Statistics, the Council unanimously asked me to offer our congratulations and best wishes on the tenth anniversary of the establishment of the Office of Naval Research.

Through its support of senior investigators and graduate students and the consequent publication of many important technical papers and books, the Office of Naval Research has been contributing greatly to the advancement of fundamental research in mathematical statistics and probability theory. This contribution is especially important because it is being made during a period when these fields are showing themselves capable of particularly rapid growth.

The help you have given our profession is but one aspect of that program through which government and science work hand in hand to the benefit of each and to that of the nation as a whole, both in military and civilian pursuits. The Navy Department is outstanding in this respect, and it must be pleased and honored by the record of your Office.

Congratulations to you and your staff and best wishes for many more years of success in your efforts.

Respectfully yours,
Leonard J. Savage
President

Fifth Annual Southern Regional Graduate Summer Session in Statistics

The fifth Southern Regional Graduate Summer Session in Statistics will be held June 16 through July 26, 1958, at Oklahoma State University, Stillwater, Oklahoma. The summer sessions are rotated annually among the following institutions: Virginia Polytechnic Institute, Oklahoma State University, University of Florida and North Carolina State College.

The program may be entered at any session, and consecutive courses will be offered in successive summers. The summer work in statistics may be applied

towards residence requirements at any one of the cooperating institutions, as well as certain other institutions, in partial fulfillment of residence requirements for graduate degrees. Each annual summer session lasts six weeks and the several courses offered carry three semester hours of graduate credit.

The summer sessions are designed to carry out a recommendation of the Southern Regional Education Board's Committee on Statistics, on which the four institutions initiating the program are represented.

The sessions will be of particular interest to (1) research and professional workers who want intensive instruction in basic statistical concepts and who wish to learn modern statistical methodology, (2) teachers of elementary statistics courses who want some formal training in modern statistics, (3) prospective candidates for graduate degrees in statistics, (4) graduate students in other fields who desire supporting work in statistics, and (5) professional statisticians who wish to keep informed of advanced specialized theory and methods.

The faculty for the 1958 Summer Session at Oklahoma State University will include the following visiting professors: H. O. Hartley, Statistical Laboratory, Iowa State College; Walter T. Federer, Biometrics Unit, Cornell University; John E. Freund, Department of Mathematics, Arizona State College; A. W. Wortham, Operations Research Department, Texas Instruments, Dallas, Texas.

The local staff includes: Carl E. Marshall (Ph.D., Iowa State), Franklin Graybill (Ph.D., Iowa State), Robert D. Morrison (Ph.D., North Carolina State), John Hamblen (Ph.D., Purdue), Roy Deal (Ph.D., University of Oklahoma), and John Hoffman (Ph.D., University of Oklahoma).

Of particular interest at this summer session will be the six weekly symposia covering six important areas in statistics. They are: Sampling Survey Designs, Experimental Designs, Non-parametric Statistics, Response Curves and Surfaces, Multiple Comparisons, and High Speed Computing. Discussants will be selected from major contributors to these areas. These invited speakers together with the outstanding summer school staff will cover the respective subjects from three points of view: applications, their mathematical bases, and the problems that lie on the frontier.

Inquiries should be addressed to Carl E. Marshall, Director, Statistical Laboratory, Oklahoma State University, Stillwater, Oklahoma.

List of International and Foreign Scientific and Technical Meetings

October 1, 1957 through 1960

(The following information was extracted from a list compiled by the Office of Scientific Information of the National Science Foundation.)

<i>Date and Place</i>	<i>Meeting, Sponsor and Subject</i>	<i>Address Queries to:</i>
Oct. 21, 1957 Lourenco Marques, Mozambique	2nd Inter-African Conference on STATISTICS, Inter-African Committee of Statistics	Secretariat, Commission for Technical Cooperation in Af- rica South of the Sahara, 43 Parliament Street, London, S. W. 1, England

<i>Date and place</i>	<i>Meeting, Sponsor and Subject</i>	<i>Address Queries to:</i>
Dec. 26, 1957-Jan. 4, 1958 Berkeley, California	Symposium on AXIOMATIC METHOD, with Special Reference to Geometry and Physics	Professor Alfred Tarski, Department of Mathematics, University of California, Berkeley 4, California
Apr. 9-13, 1958 Giessen, Germany	Society for APPLIED MATHEMATICS AND MECHANICS (GAMM), Annual Meeting	Professor Dr. Egon Ullrich, Mathematisches Institut der Justus Liebig-Hochschule, Johannesstrasse 1, (16) Giessen, Germany
Apr. 13-16, 1958 Giessen, Germany	German MATHEMATICS SOCIETY (DMV), Annual Meeting	Professor Dr. Egon Ullrich, Mathematisches Institut der Justus Liebig-Hochschule, Johannesstrasse 1, (16) Giessen, Germany
June 1958 Strasbourg, France	International Association for ANALOGY COMPUTATION, 2nd International Meeting and 1st General Assembly	Professor J. Hoffmann, Université Libre, 50 Avenue Franklin D. Roosevelt, Brussels, Belgium
Aug. 11-13, 1958 St. Andrews, Scotland	International MATHEMATICAL Union, 3rd General Assembly	Mr. F. Smithies, Mathematical Institute, 16 Chambers Street, Edinburgh 1, Scotland
Aug. 14-21, 1958 Edinburgh, Scotland	11th International Congress of MATHEMATICIANS—Logic and foundations, algebra and theory of numbers; analysis; topology; geometry; probability and statistics; applied mathematics, mathematical physics and numerical analysis; and history and education	Mr. F. Smithies, Mathematical Institute, 16 Chambers Street, Edinburgh 1, Scotland
Sept. 3-10, 1958 Namur, Belgium	2nd International Congress for CYBERNETICS, Association Internationale de Cybernetique (ASBL)—Information—Automatism (Cybernetics applied to machinery)—Automation (Cybernetics used in organizing labor)—The economical and social consequences of Automation—Cybernetics and social sciences — Cybernetics and biology	International Association for Cybernetics, 13, rue Basse-Marcelle, Namur, Belgium
Sept. 1958 Brussels, Belgium	International STATISTICAL Institute, Special Session	Institut National de Statistique, 44, rue de Louvain, Brussels, Belgium
1958 Undecided Warsaw, Poland	International Symposium on NONHOMOGENEITY IN ELASTICITY AND PLASTICITY, International Union for Theoretic-	Dr. Hugh L. Dryden, President of Union, NACA, 1512 H Street, N. W., Washington, D. C.; or Professor F. N. van

<i>Date and place</i>	<i>Meeting, Sponsor and Subject</i> cal and Applied Mechanics (IUTAM)	<i>Address Queries to:</i>
1960 Undecided Stresa, Italy	10th International Congress of APPLIED MECHANICS, Inter- national Union of Theoretical and Applied Mechanics (IUTAM)	den Dungen, Secretary of Union, 41 avenue de l'Arba- lete, Boitsfont, Brussels, Bel- gium Dr. Hugh L. Dryden, President of Union, NACA, 1512 H. Street, N. W., Washington, D. C.; or Professor F. N. van den Dungen, Secretary of Union, 41 avenue de l'Arba- lete, Boitsfont, Brussels, Belgium

Royal Statistical Society Research and Industrial Applications Sections

The Research Section and the Industrial Applications Section of the Royal Statistical Society intend to hold a Conference at the University of St. Andrews, near Edinburgh, Scotland, from 22 August to 1 September inclusive. It will be devoted to Mathematical Statistics, with special reference to those branches of the subject which have application in industry.

It is proposed that there should be three morning sessions, consisting each of two or three pre-arranged lectures, and three early evening sessions (5.30 p.m. to 6.30 p.m.) each with one pre-arranged lecture.

The afternoons will be devoted to 'Splinter Groups' which will devote themselves to special aspects, and at which informal talks of some ten or fifteen minutes each can be given without prior arrangement.

Topics to be covered in the morning and evening sessions include aspects of the analysis of variance, non-parametric inference, stochastic aspects of linear and dynamic programming, and foundations of probability in statistics.

It is hoped that many of the mathematical statisticians who will be coming from abroad to attend the Edinburgh International Congress of Mathematicians, will choose to remain in Scotland for a further few days, and take the opportunity of meeting colleagues specially interested in their field. St. Andrews, besides having the famous Golf Course, is a small Scottish town of considerable character, and a very good centre for the exploration of the Eastern Highlands.

Accommodation (from 21 August to 2 September) will be provided within the hostels of the University of St. Andrews at a reasonably low cost, details to follow later. Anyone interested should write, marking the envelope 'ST. ANDREWS CONFERENCE' to Miss U. Croker, Royal Statistical Society, address as above.

University of Michigan Graduate School of Public Health Summer Program

The University of Michigan is the host institution for a cooperative program by the accredited Schools of Public Health of the United States during the summer of 1958.

The summer program for 1958 is designed to meet some of the educational and training needs of men and women engaged in work in health and health related agencies or those preparing themselves for such work. Courses are offered at three levels. The elementary level courses are intended for those who have acquired little or no background in statistical methodology. Intermediate courses present subject matter to extend and improve knowledge and skills of those persons who have acquired the elementary concepts and skills of statistical methodology. The advanced level courses are for those who have acquired considerable background in the theory and application of statistical concepts and procedures. A seminar open to all students includes the presentation of topics of current national interest related to health sciences and statistical methodology.

The faculty will consist of Helen Abbey, The Johns Hopkins University; William G. Cochran, Harvard University; Jerome Cornfield, The National Institutes of Health; Bernard Greenberg, University of North Carolina; F. M. Hemphill, University of Michigan; Leslie Kish, University of Michigan; Donovan Thompson, University of Pittsburgh; Colin White, Yale University.

If possible, completed applications and transcripts should reach Ann Arbor by June 1, 1958, for Michigan residents and May 1, for nonresidents. Requests for application forms should be addressed to the Director of the Summer Program in Public Health Statistics, School of Public Health, University of Michigan, Ann Arbor, Michigan.

A limited number of scholarships will be available to qualified students taking courses for credit. Inquiries concerning scholarships should be addressed to Dr. F. M. Hemphill, Director of the Summer Program in Public Health Statistics, School of Public Health, University of Michigan, Ann Arbor, Michigan.

IMS MEMBERS ATTENDING THE 1957 ANNUAL MEETING OF THE IMS

(This list was not received in time to be included with the report in the December, 1957 issue.)

Forman S. Acton, Frank B. Akutowicz, William R. Allen, Allan G. Anderson, R. L. Anderson, Virgil L. Anderson, William B. Anderson, Abdur Rahman Ansari, F. J. Anscombe, Kenneth J. Arnold, Samuel I. Askovitz, Ralph Hoyt Bacon, J. C. Bain, Theodore A. Bancroft, Rolf E. Bargmann, Glenn E. Bartsch, W. D. Baten, Grace E. Bates, Geoffrey Beall, Helen P. Beard, Robert Eric Bechofer, Charles Bernard Bell, Jr., Irving Belson, Andrew Angelo Benvenuto, Agnes P. Berger, Joseph Berkson, Gerald D. Berndt, Max A. Bershad, Reid A. T. Bhaucha, Charles A. Bicking, Patrick Paul Billingsley, Richard S. Bingham, Jr., Allan Birnbaum, David Blackwell, Herman Blasbalg, Chester I. Bliss, Julius R. Blum, Isadore Blumen, John B. Boddie, Derrill Joseph Bordelon, Raj C. Bose, Helen Bozivich, Ralph Allan, Bradley, A. E. Brandt, Leroy S. Brenna, Glenn W. Brier, Harold F. Bright, Samuel H. Brooks, Bernice Brown, Irwin D. J. Bross, Benjamin Buchbinder, Robert W. Burgess, Paul J. Burke, Irving W. Burr, Glenn L. Burrows, Lyle D. Calvin, Burton H. Camp, C. S. Callard, Mavis B. Carroll, Marvin F. Carter, Jack Chassan, Herman Chernoff, Victor Chew, Chin Long Chiang, John T. Chu, Joseph Louis Ciminera, Ira H. Cisin, Willard

H. Clatworthy, Andrew G. Clark, Charles William Clunies-Ross, William G. Cochran, Paul M. Cohen, William S. Connor, Clyde H. Coombs, Lewis C. Copeland, Richard G. Cornell, Jerome Cornfield, L. M. Court, Edwin L. Cox, Paul Charles Cox, Allen T. Craig, Elliot M. Cramer, Jean A. Crockett, Lee S. Crump, Edward Eugene Cureton, Joseph F. Daly, Cuthbert Daniel, Herbert Theodore David, Willis L. Davis, Read B. Dawson, Jr., W. Edwards Deming, Arthur P. Dempster, Cyrus Derman, Lucile Derrick, Earl Louis Diamond, John K. Diederichs, James L. Dolby, Tom G. Donnelly, Acheson J. Duncan, David B. Duncan, Paul R. Dunlap, Charles W. Dunnett, David Durand, Arthur Morlan Dutton, Meyer Dwass, Albert Ross, Eckler, Jr., Sylvain Ehrenfeld, Churchell Eisenhart, Harry Eisenpress, Salah A. Elmaghraby, Lila R. Elveback, Daniel R. Embody, Walter T. Federer, A. V. Fend, Robert Ferber, George Emery Ferris, William B. Fettes, Donald Fraser, David Frazier, Spencer M. Free, Spencer Michael Free, Jr., Agnes M. Galligan, Donald A. Gardiner, Werner Gautschi, Charles E. Gates, Donald Paul Gaver, Seymour Geisser, Lincoln J. Gerende, George William Gershefski, B. C. Getchell, Walter M. Gilbert, Dorothy Morrow Gilford, Leon Gilford, Harold Glazer, William A. Glenn, Ramanathan Gnanadesikan, Leo A. Goodman, Mina H. Gourary, Bernard G. Greenberg, Samuel W. Greenhouse, Joseph Arthur Greenwood, Frank E. Grubbs, Lee Gunlogson, John Gurland, Donald Guthrie, Irwin Guttman, Robert John Hader, Max Halperin, James F. Hannan, Morris Howard Hansen, Robert H. Hanson, Bernard Harris, T. E. Harris, Boyd Harshbarger, H. Leon Harter, Herman O. Hartley, William C. Healy, Jr., Paul Heit, F. M. Hemphill, G. Ronald Herd, Irene Hess, Clifford Hildreth, Wassily Hoeffding, Robert G. Hoffmann, John F. Hofmann, David Hogben, Paul G. Homeyer, Robert Hooke, Theodore Wright Horner, William H. Horton, Daniel G. Horvitz, Professor Harold Hotelling, Earl E. Houseman, David R. Howes, Walter W. Hoy, Cyril J. Hoyt, John David Hromi, Harry M. Hughes, J. Stuart Hunter, David V. Huntsberger, Benjamin Jackson, John L. Jaech, T. A. Jeeves, Milton Vernon Johns, Jr., Howard L. Jones, Hyman B. Kaitz, Samuel Karlin, Abraham, E. Karp, Marvin A. Kastenbaum, Leo Katz, Mort Keats, Oscar Kempthorne, Robert W. Kennard, George H. Kennedy, Bradford F. Kimball, Edgar P. King, Cal J. Kirchen, Leslie Kish, Truman L. Koehler, Martin Krakowski, Clyde Y. Kramer, William C. Krumbein, William Kruskal, Morton Kupperman, George M. Kuznets, Mrs. Helen Humes Lamale, Donald E. Lamphiear, Fred C. Leone, Howard Levene, Alfred Lieberman, Gerald J. Lieberman, Gilbert Lieberman, Jacob E. Lieberman, Julius Lieblein, Benjamin Lipstein, Stuart P. Lloyd, Frederic M. Lord, Eugene Lukacs, Bob Lundegard, George F. Lunger, John Hans MacKay, William G. Madow, Ralph A. Maggio, Clifford Joseph Maloney, Joseph Mandelson, Henry Berthold Mann, Eli S. Marks, Robert H. Matthias, Philip John McCarthy, Duncan C. McCune, Harley Ellsworth McKean, Paul M. Meier, Margaret Merrell, W. Jay Merrill, Herbert A. Meyer, Paul D. Minton, Robert Mirsky, Sutton Monroe, Alex M. Mood, Roger H. Moore, Donald Frank Morrison, Milton NMI Morrison, Norman Morse, Jack Moshman, Frederick Mosteller, Mervin E. Muller, R. B. Murphy, Jack Nadler, L. F. Nanni, Raymond Nassimbene, Joseph Anthony Navarro, August A. Carl Nelson, Jr., Peter E. Ney, S. I. Neuwirth, George E. Nicholson, Monroe L. Norden, Jack I. Northam, Horace W. Norton, Aloysius Joachim O'Connor, Junjiro Ogawa, Ingram Olkin, Paul S. Olmstead, Bernard Ostle, Donald B. Owen, William R. Pabst, Jr., Nancy S. Parker, Dr. Ellis F. Parmenter, Emanuel Parzen, John F. Pauls, Robert Nixon Pendergrass, B. E. Phillips, Eugene W. Pike, Edwin James George Pitman, Aloysius J. Polaneczky, Bruce P. Price, Ronald Pyke, Dana Edward Anthony Quade, Lila Knudsen Randolph, Herman Ravitch, Stanley Reiter, Elmer Edwin Remmenga, G. J. Resnikoff, William L. Roach, Jr., Spencer W. Roberts, Herbert Robbins, Douglas S. Robson, Robert Roeloffs, Harry M. Rosenblatt, Joan R. Rosenblatt, Murray Rosenblatt, Irving Roshwalb, S. N. Roy, Herman Rubin, David Rubinstein, Phillip Justin Rulon, Marion M. Sandomire, F. E. Satterthwaite, Sam Cundiff Saunders, Leonard S. Savage, Marvin A. Schneiderman, Seymour Max Selig, Richard H. Shaw, Sidney Shtulman, Walt R. Simmons, Rosedith Sitgreaves, John H. Smith, Thaddeus L. Smith, Jean E. Smolak, Milton Sobel, Herbert Solomon, Paul N. Somerville, Frederick

A. Sorensen, Melvin Dale Springer, John J. Stansbrey, James Hall Stapleton, Roberg G. D. Steel, Arthur Stein, Frederick F. Stephan, Theodor D. Sterling, John N. Stewart, Ray B. Stiver, Jr., David S. Stoller, Samuel A. Stouffer, Jacques St. Pierre, Hale C. Sweeny, Zen Szatrowski, Robert J. Taylor, James G. C. Templeton, Benjamin J. Tepping, Milton E. Terry, Earl A. Thomas, William Alfred Thompson, Jr., George W. Thomson, Leo J. Tick, John W. Tukey, Malcolm E. Turner, Hubertus Robert Van der Vaart, Herman W. Von-Guerard, Helen M. Walker, David L. Wallace, W. Allen Wallis, John E. Walsh, Louis Weiner, Harry Weingarten, Irving Weiss, Phillips Whidden, Alfred G. Whitney, D. Ransom Whitney, John M. Wiesen, Frank Wilcoxon, Martin B. Wilk, Samuel S. Wilks, John W. Wilkinson, Evan James Williams, Gregory Williams, Myron J. Willis, Russell Lowell Wine, Gerald Winston, Max A. Woodbury, G. Stanley Woodson, Charles Ashley Wright, Charles W. Wright, William J. Youden, Marvin Zelen, John Arthur Zoellner.

Visiting Foreign Mathematicians

The following list of visiting foreign mathematicians has been received from the Division of Mathematics, National Academy of Sciences—National Research Council. The information given is, in order, the name, home country, host institution, and period of visit; AY stands for academic year 1957–1958.

Adams, John F.—U. K.—Institute for Advanced Study—AY; Adem, Jose—Mexico—Princeton University—Feb. 1958–June 1958; Akizuki, Yasuo—Japan—University of Chicago—Oct. 1, 1957–June 30, 1958; Albertoni, Sergio—Italy—New York University—Sept. 1957–Feb. 1958; Andreotti, Aldo—Italy—Institute for Advanced Study (Sept. 30, 1957–Dec. 20, 1957), Princeton University (Feb. 1958–June 1958)—Sept. 30, 1957–June 1958; Azumaya, Goro—Japan—Yale University—Sept. 1956–Sept. 1958; Beale, E. M. L.—U. K.—Princeton University—Jan. 1958–Dec. 1958; Birch, Bryan J.—U. K.—Princeton University—Sept. 1957–June 1958; Björck, Göran—Sweden—Institute for Advanced Study—AY; Bofinger, Victor J.—Australia—North Carolina State College—June 1957–April 1958; Burgers, Johannes M.—Netherlands—American University, National Bureau of Standards—Oct. 11, 1956–Oct. 1957; Carleson, Lennart—Sweden—Massachusetts Institute of Technology—Sept. 1957–Jan. 31, 1958; Cartier, Pierre—France—Institute for Advanced Study—AY; Chakravorti, J. G.—India—Brown University—AY; Chand, Uttam—India—Boston University—Jan. 1958–May 1958; Cohen, Daniel E.—U. K.—Princeton University—Sept. 1957–June 1958; Copson, E. T.—Scotland—Stanford University—Week—Feb. 1958; Corsten, L. C. A.—Netherlands—University of North Carolina—Sept. 1957–June 1958; Dedecker, Paul—Belgium—Institute for Advanced Study—Sept. 30, 1957–Dec. 20, 1957; Delsarte, Jean—France—University of Maryland—Apr. 1957–July 1957; Deny, Jacques—France—Institute for Advanced Study—Sept. 30, 1957–Dec. 20, 1957; de Rham, Georges—Switzerland—Institute for Advanced Study—AY; Dold, Albrecht—Germany—Institute for Advanced Study—Sept. 1956–Aug. 1958; Dvoretzky, Aryeh—Israel—Institute for Advanced Study—AY; Edwards, David A.—U. K.—Yale University—Sept. 1956–Sept. 1958; Ewald, Guenther—Germany—Michigan State University—Sept. 1957–June 1958; Festa, Rudolf—Austria—University of Alabama, 1956–57 (State College of Washington 1957–58)—Sept. 1956–Sept. 1958; Festa, Erika—Austria—State College of Washington (Sept.–Dec. 1957)—Sept. 1956–Sept. 1958; Foguel, Shaul—Israel—New York University—AY; Fröhlich, A.—U. K.—University of Virginia—Feb. 1958–June 1958; Gamblen, Frank—Australia—University of Kansas (Sept. 4, 1957–Feb. 1, 1958), Educational Testing Service, Princeton, N. J. (Feb. 1, 1958–June 1958)—Sept. 4, 1957–June 1958; Gautschi, Walter—Switzerland—American University, National Bureau of Standards—Oct. 1955–Sept. 1958; Ghaffari, A.

—Iran—American University, National Bureau of Standards—Sept. 1956–Sept. 1958; Goldner, Siegfried—Union of South Africa—New York University—AY; Grauert, Hans—Germany—Institute for Advanced Study—AY; Grenander, U.—Sweden—Brown University—AY; Griffiths, Hubert B.—U. K.—Institute for Advanced Study—Sept. 1956–July 1958; Guttman, Irwin—Canada—Princeton University—Sept. 1957–June 1958; Hano, Jun-ichi—Japan—University of Washington—Sept. 15, 1957–June 15, 1958; Harrop, Ronald—U. K.—Pennsylvania State University—Aug. 1957–Aug. 1958; Hellman, Olavi B.—Finland—University of California, Los Angeles—July 1956–July 1958; Helmberg, Gilbert—Austria—University of Washington—October 1, 1957–June 15, 1958; Hervé, Michel—France—Institute for Advanced Study—Sept. 30, 1957–Dec. 20, 1957; Hirsch, Guy—Belgium—Massachusetts Institute of Technology—Feb. 1, 1958–June 15, 1958; Hitotumatu, Sin—Japan—Stanford University—Sept. 1, 1957–June 30, 1958; Hüsser, Rudolph—Switzerland—University of California, Los Angeles, AY; Izumi, Shin-ichi—Japan—University of Chicago and Northwestern University (Aug. 1, 1957–May 31, 1958), Princeton University (Oct. 1957–Dec. 1957)—Aug. 1957–May 1958; Kato, Tosio—Japan—New York University—Sept.–Oct. 1957; Kawata, T.—Japan, Princeton University—Sept. 1957–March 1958; Kitawaga, T.—Japan—Princeton University—Sept. 1957–March 1958; Klingenberg, Wilhelm—Germany—Institute for Advanced Study—AY; Laasonen, V. Pentti J.—Finland—University of California, Los Angeles—July 1956–Aug. 1958; Lacombe, Daniel L. M.—France—Institute for Advanced Study—Oct. 1957–Aug. 1958; Lehto, Olli E.—Finland—Institute for Advanced Study—AY; Leopoldt, Heinrich W.—Germany—Institute for Advanced Study—Sept. 1956–Aug. 1958; Leray, Jean—France—Institute for Advanced Study—Sept. 30, 1957–Dec. 20, 1957; Lions, Jacques—France—University of Kansas—Feb. 1957–Aug. 1958; Longuet-Higgins, Michael S.—U. K.—Massachusetts Institute of Technology—Feb. 1, 1958–June 15, 1958; Lorenzen, Paul P. W.—Germany—Institute for Advanced Study—Sept. 1957–June 1958; Lucas, John R.—U. K.—Princeton University—Sept. 1957–June 1958; Lumer, Günter—Uruguay, University of Chicago—Oct. 1, 1957–Sept. 30, 1958; Mallows, Colin L.—U. K.—Princeton University—Sept. 1957–Sept. 1958; Mardešić, Sibe—Yugoslavia—Institute for Advanced Study—AY; Martin, Alfred I.—U. K.—Institute for Advanced Study—AY; Masani, Pesi—India—Massachusetts Institute of Technology—Harvard University—Sept. 16, 1957–June 15, 1958; Message, Philip J.—U. K.—Yale University—Sept. 1957–Sept. 1958; Milne-Thomson, L. M.—U. K.—Brown University—Sept. 1956–June 1958; Mixner, Joseph—Germany—New York University—Aug.–Oct. 1957; Møller, Christian—Denmark—Carnegie Institute of Technology—Sept. 1957–Feb. 1958; Nachbin, Leopoldo—Brazil—University of Chicago—Oct. 1, 1956–July 31, 1958; Nagata, Masayoshi—Japan—Harvard University—Sept. 1957–Sept. 1958; Nieminen, Toivo E.—Finland—New York University—Aug. 1957–June 1958; Ogawa, Junjiro—Japan—Institute of Statistics, University of North Carolina—Sept. 1956–Aug. 31, 1958; Olver, F. W. J.—U. K.—National Bureau of Standards—Sept. 30, 1957–Sept. 1958; O'Meara, Onorato T.—South Africa—Institute for Advanced Study—AY; Ono, Katsuzi—Japan—Massachusetts Institute of Technology—Sept. 1957–June 1958; Ostrowski, Alexander M.—Switzerland—American University, National Bureau of Standards—Oct. 10–31, 1957; Papakyriakopoulos, C. D.—Greece—Institute for Advanced Study—June 3, 1955–June 1958; Peixoto, Mauricio M.—Brazil—Princeton University—Sept. 1957–June 1958; Pfluger, Albert—Switzerland—Stanford University—Oct. 1, 1957–Mar. 30, 1958; Pucci, Carlo—Italy—University of Maryland—Sept. 1, 1956–July 1958; Puppe, Dieter—Germany—Institute for Advanced Study—Sept. 1957–June 1958; Rieger, Georg J.—Germany—University of Maryland—Sept. 1956–Aug. 1957; Riesz, Marcel—Sweden—University of Maryland—Oct. 1, 1957–Dec. 31, 1957; Robinson, Leslie R. B.—U. K.—Harvard University—Sept. 1957–Sept. 1953; Rogosinski, Werner W.—U. K.—University of Colorado—Sept. 1957–Sept. 1958; Rohrbach, Hans—Germany—University of North Carolina—Sept. 1957–June 1958; Room, T. G.—Australia—Institute for Advanced Study (AY); Princeton University (Feb. 1958–June 1958)—Sept. 1957–June 1958; Roseau, Maurice—France—New York University

—Sept. 1957–Sept. 1958; Sawyer, W. W.—U. K.—University of Illinois—Feb. 1957–Indefinite; Schopf, Andreas—Switzerland—American University—National Bureau of Standards—Sept. 30, 1957–Oct. 1958; Scriba, J. Cristoph—Germany—University of Kentucky—Sept. 1957–June 1958; Selberg, Sigmund—Norway—University of Colorado—Sept. 1957–May 1958; Serre, Jean-Pierre—France—Institute for Advanced Study—Sept. 30, 1957–Dec. 20, 1957; Skolem, Thoralf A.—Norway—University of Notre Dame—Sept. 1957–June 1958; Stoll, Wilhelm—Germany—Institute for Advanced Study—AY; Tamagawa, Tsuneo—Japan—Institute for Advanced Study (Sept. 1955–Jan. 1957 and Jan. 13, 1958–Apr. 11, 1958), Johns Hopkins University (Jan. 1957–Jan. 1958)—Sept. 1955–Apr. 1958; Tomonaga, Yasuro—Japan—University of Washington—Oct. 15, 1957–June 15, 1958; Valpola, Veli Kustaa—Finland—University of California (2 months), Princeton University (4 months)—Nov. 1957–April 1958; van der Vaart, H. R.—Netherlands—North Carolina State College—Jan. 1957–Jan. 1958; Villamayor, Orlando—Argentina—Institute for Advanced Study—Jan. 1, 1957–Dec. 31, 1957; Waelbroeck, L.—Belgium—Institute for Advanced Study—AY; Watson, Geoffrey S.—Australia—North Carolina State College (4 months), Princeton University (5 months)—April 1958–Dec. 1958; Williams, Robert M.—U. K.—Princeton University—Sept. 1957–June 1958; Wolff, Emil—U. K.—New York University—June–Nov. 1957; Yamamuro, Sadayuki—Japan—Institute for Advanced Study—Sept. 1956–Sept. 1958; Yevdjevich, V. M.—Yugoslavia—American University, National Bureau of Standards—AY; Yüksel, H.—Turkey—Brown University—AY; Zadunaisky, Pedro—Argentina—Watson Scientific Computing Laboratory—Feb. 1, 1957–Jan. 31, 1958; Agudo, F. R. D.—Portugal—University of California, Berkeley Fall 1957; Baayen, Pieter C.—Netherlands—University of California, Berkeley—AY; Fary, Istvan—Canada (Hungary)—University of California, Berkeley Jan.–June 1958; Festa, Erika—Austria—State College of Washington Sept.–Dec. 1957; Lightstone, A. H.—Canada—University of California, Berkeley—AY; Littlewood, J. E.—England—University of California, Berkeley Sept. 27–Dec. 18, 1957; Poulsen, Ebbe T.—Denmark—University of California, Berkeley July 1957–June 1958; Specker, Ernst Paul—Switzerland—Cornell University Feb. 10–Sept. 1958; Szmielew, Wanda—Poland—University of California, Berkeley—AY.

Committee on Mathematical Tables

Since its organization early in 1956, the Institute of Mathematical Statistics' Committee on Mathematical Tables has been concerned with the problems associated, either directly or indirectly, with the computation of mathematical tables of interest to statisticians. The committee's function is threefold:

- (i) To gather information relating to the tabulation of functions of interest to statisticians.
- (ii) To advise on the need for, and preparation of, statistical tables.
- (iii) To determine the availability of and coordinate the distribution of free time on high speed digital computers for the computation of statistical tables.

In order to fulfill its function, the committee investigated the interests and needs of the Institute membership concerning statistical tables and as a result set up nine subcommittees covering the areas of greatest interest. To date the activities of these subcommittees have been directed primarily towards the preparation of bibliographies in their individual fields. The subcommittees, along with their chairmen, are listed below.

1. Chi-Square,
W. Kruskal, University of Chicago
2. t -Distribution (Univariate and Multivariate),
C. W. Dunnett, American Cyanamid Company, Pearl River, New York.
3. Studentized Range,
A. H. Bowker, Stanford University
4. F -Distribution (Incomplete-Beta, Binomial),
E. E. Cureton, University of Tennessee.
5. Hypergeometric Distribution (*Not* the hypergeometric function),
W. Kruskal, University of Chicago.
6. Polyvariate Normal Distribution, including latent roots,
G. P. Steck, Sandia Corporation, Albuquerque, New Mexico
7. Availability of Simple Techniques,
Chairman not appointed.
8. Annals Supplement (Of statistical tables),
J. W. Tukey, Bell Telephone Laboratories, Murray Hill, New Jersey
9. Computing Facilities and Cost-Free Machine Time,
F. C. Leone, Case Inst. of Tech.

Additional information on any of the above activities may be obtained from the chairman of the Committee on Mathematical Tables, D. B. Owen, Sandia Corporation, Albuquerque, New Mexico, or from any of the subcommittee chairmen. Anyone having time on a digital computer which may be made available on a cost-free basis to persons desiring to compute tables of general interest is invited to contact the chairman of subcommittee 9.

I. List of Members of the IMS Committee on Mathematical Tables

Chairman

Dr. D. B. Owen, Division 5125, Sandia Corporation, Albuquerque, New Mexico

Secretary and Vice Chairman

Dr. G. P. Steck, Division 5125, Sandia Corporation, Albuquerque, New Mexico

Members

- Professor R. L. Anderson, Institute of Statistics, North Carolina State College, Raleigh, North Carolina
- Professor A. H. Bowker, Department of Statistics, Stanford University, Stanford, California
- Professor E. E. Cureton, 1846 Prospect Pl., S.E., Knoxville 15, Tennessee
- Professor W. J. Dixon, University of California, Department of Preventive Medicine and Public Health, Medical Center, Los Angeles 24, California
- Mr. C. W. Dunnett, 19 Edsall Place, Nanuet, New York
- Dr. Churchill Eisenhart, Chief, Statistical Engineering Laboratory, National Bureau of Standards, Washington 25, D. C.
- Dr. J. A. Greenwood, 16 Garfield Street, Cambridge 38, Massachusetts
- Professor H. O. Hartley, Statistical Laboratory, Iowa State College, Ames, Iowa
- Professor William Kruskal, Committee on Statistics, Eckhart Hall, University of Chicago, Chicago 37, Illinois

- Professor Fred C. Leone, Director, Statistical Laboratory, Case Institute of Technology,
10900 Euclid Avenue, Cleveland 24, Ohio
- Professor Dan Teichroew, Graduate School of Business, Stanford University, Stanford,
California
- Dr. John W. Tukey, Bell Telephone Laboratories, Murray Hill, New Jersey
- Professor M. A. Woodbury, 401 W. 205th Street, New York 34, New York
- Dr. Marvin Zelen, Statistical Engineering Laboratory, National Bureau of Standards,
Washington 25, D. C.

Ex officio members

- Professor L. J. Savage, Eckhart Hall, University of Chicago, Chicago 37, Illinois.
- Professor Jacob Wolfowitz, Dept. of Math. Cornell University, Ithaca, New York

II. *Subcommittees of the IMS Committee on Mathematical Tables*

1. *Chi-square*

- *William Kruskal
*Dan Teichroew

2. *t-distributions* (univariate and multivariate)

- *C. W. Dunnett, Chairman
Dr. H. A. David, Department of Statistics, Virginia Polytechnic Institute, Blacks-
burg, Virginia
Dr. S. S. Gupta, Department of Mathematics, University of Alberta Edmonton,
Alberta, Canada
*H. O. Hartley
Professor E. S. Keeping, Math Department, University of Alberta, Edmonton, Alberta,
Canada
Professor C. F. Kossack, Math Department, Purdue University, West Lafayette,
Indiana
Dr. A. M. Mood, General Analysis Corporation, 11753 Wilshire Boulevard, West
Los Angeles, California
J. B. Rabin, Sen. Computer Analyst, Burroughs Corporation, 1505 Sycamore Avenue,
Willow Grove, Pennsylvania
Dr. M. Sobel, Bell Telephone Lab., 555 Union Boulevard, Allentown, Pa.
*Dan Teichroew

3. *Studentized range*

- *A. H. Bowker, Chairman,
Cuthbert Daniel, 116 Pinehurst Avenue, New York 33, New York
Prof. W. T. Federer, Cornell University, Ithaca, New York
*H. O. Hartley
Professor G. E. Noether, Math Department, Boston University, 725 Commonwealth
Ave., Boston 15, Massachusetts

4. *F-distribution* (incomplete-beta, binomial)

- *E. E. Cureton, Chairman,
*R. L. Anderson
P. C. Cox, 1904 Idaho Avenue, Las Cruces, New Mexico
Professor David Durand, 50 Memorial Drive, Cambridge 39, Massachusetts
*J. A. Greenwood
*H. O. Hartley
Gunnar Kulldorff, University of Lund, Lund, Sweden, Malmgatan 16, Malmo, Sweden
*Dan Teichroew

* Member of the parent committee. See List I for address.

- **H. F. Trotter**
 Prof. J. G. Wendel, Math Department, University of Michigan, Ann Arbor, Michigan
5. *Hypergeometric distribution (not the hypergeometric function)*
***William Kruskal, Chairman,**
 Professor Leo Katz, Department of Statistics, Michigan State University, East Lansing, Michigan
 Dr. E. F. Kimball, N. Y. State Pub. Service Commission; 20 Mayfair Drive, Slingerlands, New York
 Professor G. J. Lieberman, Department of Statistics, Stanford University, Stanford, California
 Roger H. Moore, Los Alamos Scientific Laboratory, 3448A Orange, Los Alamos, New Mexico
 J. M. Wiesen, 1308 Arizona NE, Albuquerque, New Mexico
6. *Polyvariate normal, including latent roots*
***G. P. Steck, Chairman**
 Professor T. W. Anderson, Center for Advanced Study in the Behavioral Sciences, 202 Junipero Serra Blvd., Stanford, California
 P. C. Cox, (See Subcommittee 4 for address)
***C. W. Dunnett**
 S. S. Gupta, (See Subcommittee 2 for address)
 Professor Ingram Olkin, Department of Statistics, Michigan State University, East Lansing, Michigan
***D. B. Owen**
 M. Sobel, (See Subcommittee 2 for address)
***Max A Woodbury**
7. *Availability of simple techniques*
 Chairman position open.
 Professor R. A. Bradley, Department of Statistics, Virginia Polytechnic Institute, Blacksburg, Virginia
***E. E. Cureton**
***W. J. Dixon**
***Churchill Eisenhart**
 Dr. T. A. Lamke, Bu. of Res., Iowa State Teachers College, Cedar Falls, Iowa
 Professor S. B. Littauer, Columbia University, New York 27, New York
****H. R. Watkins**
8. *Annals Supplement*
***J. W. Tukey, Chairman**
 J. S. Barnes, John Wiley & Sons Inc., 440 Fourth Avenue, New York 16, N. Y.
***A. H. Bowker**
***Churchill Eisenhart**
 Dr. T. E. Harris, The RAND Corporation, 1700 Main Street, Santa Monica, Calif.
***D. B. Owen**
***Dan Teichroew**
9. *Cost-Free Machine Time*
***F. C. Leone, Chairman**
 Professor J. W. Hamblen, Computing Center, Oklahoma State University, Stillwater, Oklahoma
 W. H. Horton, Materials Engineering Department, Westinghouse Electric Corp., East Pittsburgh, Pa.

** Address unknown.

G. F. Lunger, Program Planning Department, Remington Rand Univac, St. Paul 16, Minnesota

Dr. H. A. Meyer, Director Statistical Laboratory, University of Florida, Gainesville, Florida

*Max A. Woodbury

REPORT OF THE LOS ANGELES MEETING OF THE INSTITUTE OF MATHEMATICAL STATISTICS

The Western Region Meeting, seventy-fifth meeting of the Institute of Mathematical Statistics, was held at the Los Angeles Campus of the University of California on December 27-28, 1957. Two sessions were joint with the American Statistical Association and the Institute for Management Sciences. A Special Invited Address was given by Claude Shannon, "Some Asymptotic Estimates for Sums of Random Variables." The following 69 members of the Institute attended:

I. J. Abrams, T. W. Anderson, H. L. Ang, Leo A. Aroian, C. B. Bell, D. L. Bentley, Allan Birnbaum, Colin R. Blyth, Charles Boll, Julien L. Borden, A. H. Bowker, J. V. Breakwell, Bernice Brown, Herman Chernoff, Edward P. Coleman, L. M. Court, Edwin L. Crow, W. J. Dixon, Olive Jean Dunn, H. P. Edmundson, Bob E. Ellison, T. S. Ferguson, Evelyn Fix, Martin Fox, A. V. Gafarian, Edward Gammon, Norman R. Garner, E. J. Gilbert, F. A. Graybill, Wm C. Guenther, D. Guthrie, Jr., T. E. Harris, P. G. Hoel, John F. Hofmann, John M. Howell, Arnljot Høyland, Patricia Inman, M. V. Johns, Jr., R. F. Link, Albert Madansky, Craig A. Magwire, F. Massey, M. R. Mickey, O. B. Moan, Roger A. Moore, Paul B. Moranda, James Pachares, Emanuel Parzen, M. P. Peisakoff, H. H. Peterson, Ron Pyke, Roy Radner, F. C. Reed, David Rothman, Marion M. Sandomire, Henry Scheffé, E. M. Scheuer, Franklin Sheehan, Bernard Sherman, M. M. Siddiqui, Paul N. Somerville, D. Stoller, Fred H. Tingey, Howard G. Tucker, John W. Tukey, H. W. von Guérard, John E. Walsh, Louis H. Wegner, Bryan Wilkinson.

The program of the meeting was as follows:

Friday, December 27, 1957

8:45-12:00 a.m. Statistics in the Management Sciences
(Joint Session with The Institute of Management Sciences)

Chairman: M. R. Mickey, Jr., The RAND Corporation.

1. *The Portfolio Selection Problem*, Harry Markowitz, The RAND Corporation
2. *On the Stochastic Theory of Inventory*, I. J. Abrams, The Ramo-Wooldridge Corporation.
3. *Inventory Control Problems of Shipboard Supplies*, Mina H. Gourary, George Washington University. (Read by Bernice B. Brown, The RAND Corporation).
4. *Demand for and Allocation of Engineering Personnel*, Rajendra Kashyap (introduced by H. W. von Guerard) and Hermann W. von Guerard, Lockheed Aircraft Corporation.

1:45-2:15 p.m. Special Invited Paper

Chairman: Thomas S. Ferguson, University of California, Los Angeles

Some Asymptotic Estimates for Sums of Random Variables

Claude Shannon, MIT, The Center for Advanced Study in the Behavioral Sciences, and Bell Telephone Laboratories.

2:30-5:00 p.m. Industrial Applications of Statistics

(Joint Session with the American Statistical Association)

Chairman: John F. Hofmann, Systems Laboratories Corporation

1. *Some Applications of Experimental Design in Industry*, Alex M. Mood and Paul Somerville, General Analysis Corporation.
2. *The Fitting of a Polynomial Form to a Function of Several Variables by the Use of Orthogonal Latin Squares*, N. M. Peterson, Convair, Fort Worth.
3. *Confidence Intervals for the Reliability of Multi-Stage Systems*, William C. Hoffman, The RAND Corporation.
4. *A Model for Depicting Fatigue*, Irvin Whiteman, General Analysis Corporation (introduced by A. M. Mood).
5. *Long Range Planning for Manufacturing*, Glen Ghormley, Cannon Electric Company.

Saturday, December 28, 1957

8:45-10:45 a.m. Stochastic Processes Applied to Medicine and Public Health

Chairman: Frank J. Massey, University of California, Los Angeles

1. *Replication Versus Increasing Observation Points in the Estimation of Regression for Growth Type Data*, Paul G. Hoel, University of California, Los Angeles.
2. *The Identifiability Problem for Functions of Finite Markov Chains*, Edgar John Gilbert, University of California, Berkeley.

11:00-12:00 a.m. Invited Address

Chairman: Roger A. Moore, The Ramo-Wooldridge Corporation

1. *Statistical Theory of Some Quantal Response Models*, Allen Birnbaum, Columbia University.

1:45-2:45 p.m. Invited Address

Chairman: O. B. Moan, Lockheed Aircraft Corporation

1. *Experiments with Mixtures*, Henry Scheffé, University of California, Berkeley.

3:00-5:00 p.m. Contributed Papers

Chairman: Richard F. Link, Oregon State College

1. *Non-parametric Multiple-decision Procedures for Selecting That One of K Populations which has the Highest Probability of Yielding the Largest Obser-*

- vation. (Preliminary Report). Robert Bechhofer, Cornell University, and Milton Sobel, Bell Telephone Laboratories. (By Title)
2. *The Asymptotic Efficiency of Friedman's Chi-square_r-test (χ_r^2 -test)*. Ph. van Elteren, Mathematical Centre, Amsterdam. (By title)
 3. *Least-squares Estimation when Residuals are Correlated*. M. M. Siddiqui, University of North Carolina.
 4. *A Property of Additively Closed Families of Distributions*. Edwin L. Crow, Boulder Laboratories, National Bureau of Standards.
 5. *Determining Sample Size for a Specified Width Confidence Interval*. Franklin A. Graybill, Oklahoma State University.
 6. *Nonparametric Estimation of Sample Percentage Point Standard Deviation*. John E. Walsh, Lockheed Aircraft Corporation.
 7. *On the Structure of Distribution-free Statistics*. C. B. Bell, Xavier University of Louisiana and Stanford University.
 8. *Estimation of the Location of a Discontinuity in Density*. J. V. Breakwell, Lockheed Missile Systems Division, Palo Alto, and H. Chernoff, Stanford University.
 9. *On the Supremum of the Poisson Process*. Ronald Pyke, Stanford University.

EVELYN FIX
Associate Secretary

REPORT OF THE EDITOR OF THE ANNALS FOR 1957

During the year ending August 1, 1957, more new manuscripts were received by the *Annals*, totaling more manuscript pages, than in any previous year. A consequent increased requirement for printing is anticipated for the coming year, and the Council has authorized a 1958 volume of 1300 pages.

The 1957 volume, totaling 1098 pages, contained 105 papers and notes. The increased size authorized by the Council in the past two years made it possible to keep the backlog at less than half an issue during 1957.

The *Annals* is indebted to its staff of Cooperating Members, who do much of the refereeing, and to the following people who have generously given refereeing assistance: T. W. Anderson, P. Armitage, E. W. Barankin, M. S. Bartlett, R. Blumenthal, R. Bechhofer, G. E. P. Box, L. Breiman, D. L. Burkholder, S. Chandrasekhar, W. G. Cochran, W. S. Connor, L. Cote, S. L. Crump, F. N. David, M. D. Donsker, R. Dorfman, A. Duncan, M. Dwass, B. Epstein, P. Erdős, T. S. Ferguson, L. J. Folks, E. J. Gilbert, I. J. Good, L. Goodman, F. Graybill, U. Grenander, S. S. Gupta, J. F. Hannan, M. H. Hansen, W. Hoeffding, P. G. Hoel, H. Hotelling, A. T. James, N. L. Johnson, E. S. Keeping, J. H. B. Kemperman, D. G. Kendall, M. G. Kendall, H. Kesten, E. L. Lehmann, J. Leiblein, R. Leipnik, M. Loève, E. Lukacs, J. McGregor, A. Madansky, W. G. Madow, M. R. Mickey, A. M. Mood, P. A. P. Moran, F. Mosteller, J. Moyal, R. W. Murphy, M. Newman, I. Olkin, E. Parzen, R. L. Plackett, J. Pratt,

R. Pyke, C. R. Rao, D. Ray, G. E. H. Reuter, J. Riordan, M. Rosenblatt, H. L. Royden, H. Rubin, J. Sacks, I. R. Savage, H. Scheffé, E. L. Scott, J. F. Scott, R. Sitgreaves, C. Streibel, R. F. Tate, D. Teichroew, A. J. Thomasian, H. Trotter, J. W. Tukey, D. L. Wallace, J. E. Walsh, B. L. Welch, L. Wegner, R. A. Wijsman, D. M. G. Wishart, G. Zyskind.

Many thanks are due Ann Greene, Dorothy Stewart, and Margaret Wray, for handling the taxing work of the editorial office.

T. E. HARRIS
Editor

December 26, 1957

SUMMER SESSIONS AT BERKELEY, CALIFORNIA

The 1958 summer program in the Department of Statistics of the University of California, Berkeley, California, will consist of two sessions: June 16 to July 26 and July 28 to September 6. The faculty of the summer sessions will include Professor U. S. Nair of Travancore University in India, Dr. F. N. David of University College in London, and Professors David Blackwell, Evelyn Fix, Joseph L. Hodges, Jr., and J. Neyman of the Department of Statistics of the University of California, Berkeley. The program will include two undergraduate courses in each session, and two research seminars, one in statistical problems of health and one in the statistical study of structural relations in the physical sciences.

PUBLICATIONS RECEIVED

- Chow, G. C., *Demand for Automobiles in the United States*, North-Holland Publishing Company, Amsterdam, (1957) v-110 pp., \$10.00.
- Economica, Revista de la Facultad de Ciencias Economicas*, Publicacion Trimestral, Diagonal 77-4 Y 5, La Plata, Buenos Aires, Argentina.
- Contributions to the Theory of Games*, Volume III, Edited by M. Dresher, A. W. Tucker, P. Wolfe, Princeton, New Jersey, Princeton University Press, 1957 Annals of Mathematics Studies Number 39.