

## NEWS AND NOTICES

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

### Personal Items

Dr. Gordon Antelman has returned to the Department of Statistics, the Graduate School of Business, University of Chicago, after being on leave at the Florida State University during the summer of 1964 as a Research Associate.

Charles E. Branscomb has been promoted to director of the instructional systems development department of International Business Machines Corporation. He will be responsible for the development of information handling equipment for instructional processes.

Professor Harold F. Bright, Chairman of the Department of Statistics at The George Washington University, has been appointed as Associate Dean of Faculties effective 1 September, 1964.

Dr. K. C. Chanda, Visiting Associate Professor at Iowa State University for two years, returned to India September 1 to become Professor of Mathematics and Statistics at Punjab Agricultural University, Ludhiana, East Pakistan.

Dr. S. D. Chatterji will be at the Department of Mathematics, University of Heidelberg, Heidelberg, W. Germany, after September 1, 1964.

Dr. R. G. Cornell has returned to his position at the Florida State University after teaching in the Department of Biostatistics, the University of North Carolina during the summer of 1964.

Mr. Roger R. Davidson has been appointed Instructor in the Department of Statistics, Florida State University, and is teaching in the Florida State University Graduate Program at Eglin Air Force Base, Florida.

Dr. Zakkula Govindarajulu, Associate Professor of Mathematics, Case Institute of Technology, will be at the Department of Statistics, University of California, Berkeley, for the academic year 1964-65. He will be on a leave of absence from Case Institute of Technology, Cleveland.

Dr. Bruce M. Hill has been promoted to Associate Professor in the Department of Mathematics of the University of Michigan. During the academic year 1964-65 he will be on leave of absence at the Graduate School of Business Administration, Harvard University.

Dr. V. S. Huzurbazar, who was Visiting Professor of Statistics at Iowa State for two years, returned June 1 to his position as Head of the Department of Mathematics and Statistics at the University of Poona, Poona, India.

Dr. S. K. Katti has returned to his position as Associate Professor of Statistics at the Florida State University after being on leave at Stanford University for the summer of 1964.

Prof. O. Kempthorne of the staff of the Statistical Laboratory and Dept. of Statistics at Iowa State University has been named Distinguished Professor of Statistics at Iowa State. He is one of four professors in the College of Sciences and Humanities to have been so honored, a fact which is a recognition of the contribution of statistics to scientific research.

Professor Solomon Kullback has been appointed as Chairman of the Department of Statistics at The George Washington University effective 1 September 1964.

Dr. Eugene H. Lehman, Jr., has accepted the position of Systems Engineer-Mathematical at Telecomputing Services, Inc., Panorama City, California. He has also been appointed Chairman of the Mathematics Department at newly organized Northridge College of Science and Engineering at Northridge, California.

Frederick Leysieffer has completed requirements for the Ph.D. degree in mathematics with a major in probability at the University of Michigan and has joined the Department of Statistics of the Florida State University, Tallahassee, as Assistant Professor of Statistics.

John Mandel, of the National Bureau of Standards in Washington, D.C., will be spending the coming academic year as a guest worker at the Technological University of Eindhoven, Netherlands.

Duane A. Meeter has completed the Ph.D. degree at the University of Wisconsin in the Department of Statistics of that University and is now Assistant Professor of Statistics at the Florida State University.

Edward C. Molina, an international authority on classical mathematical probability theory and a major contributor to the development of modern common control telephone switching systems, died suddenly at his home in East Orange, N. J. on April 29. He was 86 years old.

Dr. G. P. Patil of McGill University is now Professor of Mathematical Statistics at Pennsylvania State University, University Park, Pennsylvania.

Mr. N. U. Prabhu, currently on sabbatical leave from the University of Western Australia, is spending the academic year 1964-65 at the Michigan State University, East Lansing, as Visiting Associate Professor.

Frank Proschan will be spending the 1964-1965 academic year in the Industrial Engineering Department of the University of California, Berkeley, on leave from the Boeing Scientific Research Laboratories.

Professor Ronald Pyke of the Department of Mathematics, University of Washington, Seattle, is on sabbatical leave for the academic year 1964-65, and will be visiting the Statistical Laboratory of the University of Cambridge during this time.

Dr. P. V. Rao, formerly Assistant Professor of Statistics at the University of Georgia, has joined the staff of the Department of Statistics, University of Florida, as an Assistant Professor.

Professor Murray Rosenblatt of Brown University has been appointed to a professorship in the Mathematics Department of the University of California, San Diego.

Dr. G. Sankaranarayanan, Reader, Department of Mathematics, Annamalai University, India, has been promoted as Additional Professor of Mathematics in the same department.

J. Sethuraman, Research Associate, Department of Statistics, Michigan State

University, is now a Research Associate in the Department of Statistics, Stanford University, from summer 1964. J. Sethuraman is on leave from the Research and Training School, Indian Statistical Institute, Calcutta.

---

### New Members

*The following persons have been elected to membership in the Institute.*

- Adams, Donald H.**, B.S., (University of New England); Tutor, Department of Mathematics, University of New England, Armidale, New South Wales, Australia.
- Adichie, James N.**, B.A., (London University); Graduate Student in Department of Statistics, University of California, Berkeley 4, California.
- Ahmed, Khalil M.**, M.Sc., (Stanford University); Graduate Student in Industrial Engineering Department, Stanford University, Stanford, California; *P.O. Box 3486, Stanford, California 94305.*
- Aynew, Ejigou, M.P.H.**, (University of Minnesota); Graduate Student, University of Minnesota, Minneapolis, Minnesota; *Centennial Hall, 7319, University of Minnesota, Minneapolis, Minnesota, 55455.*
- Belovitz, Meyer W.**, M.B.A., (Northwestern University); Graduate Student in Economics Department, Purdue University, Lafayette, Indiana; *757 Graduate House, W. Lafayette, Indiana.*
- Briese, Franklin W.**, M.S., (University of Minnesota); Instructor in the Biostatistics Division, School of Public Health, College of Medical Sciences, University of Minnesota, Minneapolis, Minnesota 55455; *3010—40th Avenue South, Minneapolis, Minnesota 55406.*
- Bury, John C.**, Student, Bowling Green State University, Bowling Green, Ohio; *15 Maple Avenue, Gowanda, New York.*
- Chale, David, A.B.**, (University of Chicago); Graduate Student in Department of Statistics, University of California, Berkeley 4, California.
- Cotton, Gerald F.**, B.S., (Allegheny College); Graduate Student, Virginia Polytechnic Institute, Blacksburg, Virginia; *S-3 Drapers Meadow, Blacksburg, Virginia.*
- Cruz, Ildefonso T.**, C.P.H., (University of the Philippines); Assistant Professor in Biostatistics, Institute of Hygiene, University of the Philippines, 625 Herran Street, Manila, Philippines; *156 Daniels Road, Chapel Hill, North Carolina.*
- Dacey, Michael F.**, Ph.D., (University of Washington); Research Associate in the Department of Geography, Northwestern University, Evanston, Illinois 60201.
- De Kroon, Josephus P. M.**, M.S., (Rijksuniversiteit Utrecht); Deputy-head of Statistical Institute, The Hague, Netherlands.
- Dudewicz, Edward J.**, B.S., (Massachusetts Institute of Technology); Teaching Assistant/Student in Department of Industrial Engineering and Administration, Cornell University, Ithaca, New York 14850.
- Duncan, George T.**, M.S., (University of Chicago); Graduate Student, University of Chicago, Chicago, Illinois; *17 Huckleberry House, Hudson View Park, Beacon, New York 12508.*
- Feder, Paul I.**, M.Sc., (Stanford University); Graduate Student in Department of Statistics, Stanford University, Stanford, California.
- Fox, Richard J.**, B.S., (University of Dayton); Graduate Assistant, Michigan State University, East Lansing, Michigan; *1001 East Grand River Avenue, East Lansing, Michigan.*
- Fuller, Robert G.**, B.S., (University of Alabama); Quality Service Engineer (Junior Engineer), Gulf States Paper Corporation, Tuscaloosa Division, Tuscaloosa, Alabama; *7-A Terrace Court, Tuscaloosa, Alabama.*
- Gammans, Michael P.**, M.A., (University of Alabama); Statistician, Courtaulds North America Inc., P.O. Box 1076, Mobile, Alabama 36601.

- Halpern, Elkan F.**, M.S., (University of Michigan); Graduate Student, University of Michigan, Ann Arbor, Michigan; *1110 Prospect, Ann Arbor, Michigan.*
- Han, Chien-Pai**, M.A., (University of Minnesota); Graduate Student, Harvard University, Cambridge, Massachusetts; *42 Kirkland Street, Cambridge 38, Massachusetts 02138.*
- Hassanein, Khatab M.**, Ph.D., (University of North Carolina); Assistant Professor, Institute of Statistics, Cairo University, Cairo, Egypt (U.A.R.); *7 Darik Saad Street, Apt. 8, Cairo, Egypt (U.A.R.).*
- Hatfield, Verle Elaine Weiss**, B.A., (Stanford University); Computer Programmer, United Technology Corp., Argues Avenue, Palo Alto, California; *377 Diablo Ct., Palo Alto, California.*
- Khan, Aqeel Ahmad**, M.Sc., (Aligarh Muslim University, India); Graduate Assistant in Department of Mathematics, Ohio State University, 231 West 18th, Columbus 10, Ohio.
- Kidd, Rex O.**, M.S., (University of California at Los Angeles); Systems Analysis Engineer, Lockheed-California Co., P.O. Box 551, Burbank, California; *11144 Hayvenhurst Avenue, Granada Hills, California.*
- Kirsch, Walter J., III**, B.S., (Tulane University); Lt., U. S. Navy, U. S. Naval Post Graduate School, Monterey, California 93940; *Box 1067, U. S. Naval Post Graduate School, Monterey, California 93940.*
- Kronmal, Richard A.**, Ph.D., (University of California at Los Angeles); Instructor in Biostatistics, Department of Preventive Medicine, University of Washington, Seattle, Washington.
- Lawing, William D.**, M.S., (North Carolina State College); Instructor in Department of Statistics, Iowa State University, Ames, Iowa 50010.
- Lury, Dennis A.**, B.Sc., (London School of Economics); Senior Lecturer, University College, Nairobi, Kenya, P.O. Box 30197, Nairobi, Kenya.
- Mach, Anthony**, M.B.A., (University of Pennsylvania); Instructor in Economics, Western Maryland College, Westminster, Maryland; *151 Pennsylvania Avenue, Westminster, Maryland.*
- Miller, Millage C., III**, Ph.D., (University of Oklahoma Medical School); Assistant Professor in the Biostatistical Unit, Department of Preventive Medicine and Public Health, University of Oklahoma Medical Center, 800 North East 13th Street, Oklahoma City, Oklahoma 73104.
- Moore, Marc**, B.A., (Université de Montreal); Etudiant en Maitrise, Université de Montreal, Case, Postal 6128 Montreal Province of Quebec; *460 Boulevard Hébert, La Provedence, St. Hyacinthe, Province of Quebec, Canada.*
- Moreno, Jerry L.**, B.A., (Lehigh University); Graduate Assistant, Michigan State University, East Lansing, Michigan; *1113 J. University Village, Michigan State University, East Lansing, Michigan.*
- Murfitt, Philip D.**, B.S., (Indiana University); Planning Assistant, The Lincoln National Life Insurance Co., 1301 South Harrison Street, Fort Wayne, Indiana; *1109 Highland Ct., Plymouth, Indiana 46562.*
- Myers, James H., Jr.**, M.S. (Southern Illinois University); Graduate Student in Statistics Department, Virginia Polytechnic Institute, Blacksburg, Virginia; *701 North Main, Blacksburg, Virginia.*
- Neville, Raymond Herbert**, B.S., (Utah State University); Graduate Student in Department of Applied Statistics, Utah State University, Logan, Utah; *233 South 1st E., Brigham City, Utah.*
- Nuri, Walid Abdul-Hamid**, M.Sc., (Purdue University); Graduate Student in Department of Experimental Statistics, North Carolina State College Raleigh, North Carolina; *G-22 McKimmon Village, Raleigh, North Carolina.*
- Panik, Michael Joseph**, A.B., (St. Vincent College); N.A.S.A. Fellow, Graduate School of Arts and Sciences, Boston College, Chestnut Hill 67, Massachusetts; *313 Russellwood Avenue, McKees Rock, Pennsylvania 15136.*

- Powell, Barbara A.**, A.B., (New York State College for Teachers at Albany); Mathematical Statistician, Census Bureau, Washington 25, D. C.
- Price, Patricia Ann**, A.B., (University of Tennessee); Research Assistant in Bureau of Business and Economic Research, University of Tennessee, Knoxville, Tennessee.
- Price, Robert Lohman**, B.E.E., (Rensselaer Polytechnic Institute); Sales Engineer, Emtech Research Products Corp., 125 Beechwood Avenue, New Rochelle, New York; *345 East 81 Street, New York New, York 10028.*
- Reinach, Stephanus G.**, M.Sc., (University of Pretoria); Senior Lecturer in Biometry, University of Pretoria, Pretoria, South Africa; *Private Bag 271, Pretoria, South Africa.*
- Reynolds, Donald C.**, M.B.A., (Columbia University); Graduate Student, New York University, New York, New York; *1230 Park Avenue Apt. 16-B, New York, New York 10028.*
- Ruble, William L.**, M.S., (Michigan State University); Research Associate in Agricultural Experiment Station, Michigan State University, East Lansing, Michigan; *320 Computer Center, Michigan State University, East Lansing, Michigan.*
- Rutherford, John Ross**, M.A., (Queen's University, Canada); Research Fellow, Virginia Polytechnic Institute, Blacksburg, Virginia; *303½ Grayland Avenue, Blacksburg, Virginia.*
- Roudabush, Glen E.**, Ph.D., (University of Washington); Research Scientist/Assistant Professor of Psychology, American Institute for Research, University of Pittsburgh, Pittsburgh, Pennsylvania *15213.*
- Sandock, Jules**, M.S., (New York University); Graduate Student, New York University, Washington Square, New York, New York 10003; *77 East 12th Street, Apt. 15H, New York, New York 10003.*
- Scheffer, Carel L.**, M.S., (University of Amsterdam); Research Worker in Probability and Statistics, University of Utrecht, Boothstraat 1°, Utrecht, Holland, *Valkenstein 110, Amsterdam ZII, Holland.*
- Sievers, Gerald L.**, M.S., (University of Iowa); Research Assistant, Department of Physics, University of Iowa, Iowa City, Iowa; *2 Melrose Circle, Iowa City, Iowa.*
- Srivastava, Surendra Kumar**, M.Sc., (Lucknow University); Lecturer in Dept. of Statistics, Lucknow University, Lucknow, India.
- Tong, Yung-Liang**, M.A., (University of Minnesota); Graduate Student, Department of Statistics, University of Minnesota, Minneapolis, Minnesota *55455.*
- Troskie, Casparus Gerhardus**, Ph.D., (University of South Africa); Lecturer, Department of Mathematics, University of Cape Town, Rondebosch, South Africa.
- van der Meulen, Edward Cornelis**, M.S.; (University of Leyden); Teaching Assistant, Department of Statistics, University of California, Berkeley 4, California.
- Van Ness, John W.**, Ph.D., (Brown University); Assistant Professor, Stanford University, Stanford, California; *Sequoia Hall, Stanford University, Stanford, California.*
- Vilaplana, José P.**, Diploma Investigación Operative, (Universidad de Madrid); Graduate Student, Facultad de Ciencias, Sección de Matemáticas Ciudad Universitaria, Universidad de Madrid, Spain; *Instituto de Investigaciones Estadísticas C.S.I.C., c/Serrano No. 123, Madrid 6, Spain.*
- Weiner, Howard J.**, Ph.D., (Stanford University); Assistant Professor in Statistics, Stanford University, Stanford, California.
- Weiner, John M.**, Dr.P.H., (University of California at Los Angeles); Biostatistician, University of Southern California Atherosclerosis Project, University of Southern California Medical School, 2025 Zonal Avenue, Los Angeles, California; *4108 Benedict Canyon Drive, Sherman Oaks, California.*
- White, David**, Ph.D., (Oklahoma State University); Assistant Professor, Bio-statistical Unit, Medical Center, University of Oklahoma, 800 North East 13th Street, Oklahoma City, Oklahoma.
- Wolfe, Sharon L.**, M.A., (University of Illinois); Assistant Research Programmer, University of Illinois, Urbana, Illinois; *506 South Gregory Place, Urbana, Illinois.*
- Wollen, Roger C.**, B.M.E., (Rensselaer Polytechnic Institute); Project Engineer, Foster

Wheeler Corp., 110 South Orange Avenue, Livingston, New Jersey; 95 Christopher Street, New York, New York 10014.

Yang, Grace Lo, M.A., (University of California, Berkeley); Graduate Student in Department of Statistics, University of California, Berkeley 4, California.

---

### BIMONTHLY PUBLICATION OF THE ANNALS

Beginning in 1965, the *Annals* will be published six times a year, in February, April, June, August, October and December.

---

### TREASURER FOR THE INSTITUTE OF MATHEMATICAL STATISTICS

Professor George J. Resnikoff of California State College at Hayward, California has been elected by the Council of the Institute of Mathematical Statistics to a three year term as Treasurer of the Institute. Professor Resnikoff replaces Professor Gerald J. Lieberman of Stanford University who has been Treasurer since 1960. Communications concerning subscriptions, back numbers, payment of dues, membership, changes of address, etc. should subsequently be addressed to Professor George J. Resnikoff, Department of Statistics, California State College, Hayward, California 94542.

---

### ABSTRACTS TO THE MANAGING EDITOR

Abstracts of papers should be sent not to the Editor of the *Annals* but to the Managing Editor, Professor P. L. Meyer, Department of Mathematics, Washington State University, Pullman, Washington 99163.

---

### PROGRAM OF VISITING LECTURERS IN STATISTICS 1964-65

With the financial support of the National Science Foundation, a Visiting Lecturer Program in Statistics is being sponsored jointly by the principal statistical organizations of the country, the American Statistical Association, Biometric Society, and Institute of Mathematical Statistics. Leading teachers and research workers in statistics have agreed to participate as lecturers. The lecturers for the 1964-65 academic year are: R. L. Anderson, T. W. Anderson, R. E. Bechhofer, Z. W. Birnbaum, J. R. Blum, R. A. Bradley, H. D. Brunk, J. M. Cameron, D. G. Chapman, H. Chernoff, H. T. David, A. P. Dempster, C. Derman, M. Dwass, S. Ehrenfeld, B. Epstein, T. S. Ferguson, F. A. Graybill, S. S. Gupta, W. J. Hall, H. O. Hartley, L. Katz, A. W. Kimball, C. H. Kraft, L. M. Le Cam, L. E. Moses, J. Neyman, I. Olkin, H. E. Robbins, Joan R. Rosenblatt, J. Rosenblatt, J. Sacks, I. R. Savage, D. L. Wallace, G. S. Watson, O. Wesler, J. Wolfowitz.

The program has five main objectives:

1. To provide education and information on the nature and scope of modern statistics and to correct misconceptions held in regard to the science.
2. To establish and emphasize the role that statistics plays in research and practice in all fields of scientific endeavor, particularly those involving experimental research, and to encourage instruction in statistical theory and application to students in all academic areas.
3. To create an awareness of the opportunities for careers in statistics among young men and women of high potential mathematical abilities and to encourage them to seek advanced training in statistics.
4. To provide information and advice to students, student counselors, and university and college faculties on the present availability of advanced training in statistics.
5. To encourage and stimulate new programs in statistics both to supplement programs in other curricula and to develop programs for the training of statisticians.

Such programs in other scientific areas such as chemistry, astronomy, and mathematics have met with great success in recent years. The presidents of the above-mentioned statistical organizations initiated the present program because of the rapid development of modern statistics and the scarcity of statisticians in colleges and universities today. These factors make it even more necessary in statistics than in the older and better known scientific areas, to give insight and to correct misimpressions regarding the nature of the subject and the opportunities in the area.

The Organizing Committee for these lectures consists of R. L. Anderson, D. J. Bogue, R. A. Bradley, G. J. Lieberman, and J. Kiefer, Chairman. Brochures describing the program's operation were mailed to colleges throughout the U. S. in August. Institutions not receiving the brochure or requiring further information should write to Professor J. Kiefer, Department of Mathematics, Cornell University, Ithaca, New York.

---

#### REPORT OF THE COMMITTEE ON A VISITING LECTURER PROGRAM IN STATISTICS

The 3-year NSF grant to COPSS (administered by IMS) for a Visiting Lecturer Program in Statistics was confirmed too late in 1962 for a sensible 1962-63 program to be initiated, so the Committee decided to use the funds over a 2-year period and to request an extension or renewal of the grant thereafter, if that seemed appropriate. Thus, 1963-64 was the first year of the program.

The program was received with an enthusiasm which even the Committee (and probably COPSS) did not anticipate. Approximately 700 brochures announcing the program were mailed to colleges and universities throughout the country. Approximately 100 requests for lecturers were received (some of them representing several schools operating jointly), and over 70 visits were made by

our 31 lecturers. (The schools which had to be refused will receive first priority next year.) The demand was at least twice what we predicted based on the experience of other scientific societies which had carried out similar programs.

The reason for this success, and for the many unsolicited and enthusiastic letters the Committee has received from visited institutions, is unquestionably the willingness of the very best statisticians to participate as lecturers. In comparing our brochure with those of other similar programs, one notices at once a difference in the relative stature of the average lecturer; obviously a small school is more enthusiastic about requesting the appearance of a well-known scientific leader than of a competent unknown, even though the latter might do an excellent job.

It remains to be seen to what this initial demand will decrease as the novelty disappears. Present indications are that the 1964-65 demand will warrant our asking for a renewal of the NSF grant to support a continuation of the program.

Mechanically, the program has operated as follows: The Committee proposed and voted on lecturers, who were then asked in appropriate order to serve. (The number of lecturers has been increased from 31 to 36 for 1964-65, about half of the lecturers being "repeaters.") The brochure describing the program, along with request forms, was mailed through the best vehicle we could find, the American Mathematical Society list of 650 department chairmen. A covering letter asked the recipient to forward the brochure to someone else at his institution if this seemed more appropriate. Since we wanted most of all to send lecturers to small schools which offer little or no statistics, this seemed the most likely addressee; we felt that a brochure sent to a college president would more probably go astray. (For the coming year we will also address brochures to business school and agriculture school heads.) Requests for lecturers were sent by the institutions to Cornell. Originally the Committee had planned to meet in order to assign lecturers, but this proved unnecessary: almost every school which was assigned a speaker received the first of its three choices, and the assigning process required very little effort. Each assignment of a lecturer was announced to both lecturer and institution, and it then became the responsibility of the institution to make arrangements of dates and other details with the speaker; this mechanism probably cut our administrative time to one quarter of what it would have been otherwise. Speakers sent vouchers to the IMS office in Stanford for reimbursement (travel + \$15 per diem + \$50 honorarium per day, standard NSF allowances).

Despite the unexpected demand for speakers, the large number of requests was not in itself the factor which dictated the point at which no further requests could be accepted. Rather, it was the unpredicted preponderance of requests from the Midwest and Southwest, which eventually overloaded the speakers in those areas. (It had been decided that, during this first year of inexperience, speakers should not be assigned to distant institutions; we had encouraged flexibility in planning the duration of visits, which caused some uncertainty regarding expenses, and therefore decided to put some limitation on travel



expenses.) Next year's new speakers have been chosen with this additional consideration of region in mind; also, more long trips will be budgeted next year if an unbalanced demand warrants them.

While the IMS is bearing the main load in this operation, in terms of administrative effort as well as participation of lecturers, we continue to feel that it is appropriate for the IMS to continue with the present arrangement where, in effect, it operates the program for COPSS.

The financial picture as of June 30, 1964, is as follows:

Amount of Grant.....		\$40,000.00
Expenditures:		
Honorarium.....	6,475.00	
Travel.....	7,060.08	
Other direct costs:		
Printing.....	\$458.77	
Mailing.....	120.96	
Other.....	85.75	665.48
		<hr/>
Total.....	\$14,200.56	
Less:		
Contributions from participating schools.....	2,172.00	
		<hr/>
Net.....		12,028.56
		<hr/>
Balance of Grant.....		\$27,971.44

JACK C. KIEFER  
GERALD J. LIEBERMAN

### ADVANCED SCIENCE SEMINAR

The first National Science Foundation sponsored Advanced Science Seminar in Mathematical Statistics was held this summer at the Department of Mathematics and Statistics, Colorado State University, Fort Collins, Colorado. The seminar, devoted to the analysis of variance, was endorsed by the Institute of Mathematical Statistics.

Eight speakers presented seventy lectures on special topics in the analysis of variance. Professors S. N. Roy and W. T. Federer each delivered twenty lectures developing the history, statistical and mathematical basis, and applications of the analysis. The remaining six lecturers spoke on: Optimum properties of test in the analysis of variance, D. G. Chapman; Multiple confidence intervals and ranked means, H. O. Hartley; Computer arithmetic, W. R. Harvey; Industrial designs and construction of fractional replication plans, S. Addelman; Stationary processes and the analysis of variance, M. M. Siddiqui; The calculus of factorials, M. Zelen.

The twenty-five students attending represented departments of mathematics, statistics, and economics from: Arizona, Brigham Young, Colorado State, Cornell, Florida State, Harvard, Michigan Technological, Minnesota, North

Carolina State, Oregon State, Purdue, and Stanford Universities and Case Institute of Technology.

---

### **UNDERGRADUATE CONCENTRATION IN STATISTICS AT HARVARD**

In 1964-65 Harvard University will offer for the first time an undergraduate major in statistics. Students shall take at least six full-year courses in statistics, mathematics, or a related field, of which at least five half-courses shall be in statistics. Tutorials will be available in the Junior and Senior year, and candidates for honors shall write a senior thesis in addition to taking extra course work.

---

### **FELLOWSHIP AND RESEARCH OPPORTUNITIES IN MATHEMATICS**

The Division of Mathematics, National Academy of Sciences—National Research Council, calls attention to a variety of fellowship and other support for basic research in mathematics at both the predoctoral and postdoctoral levels to be awarded during the year 1964-65. Copies of the complete announcement are available from the Division of Mathematics, National Academy of Sciences—National Research Council, 2101 Constitution Avenue, N.W., Washington, D. C. 20418.

---

### **PROFESSORS OF STATISTICS FOR CIENES**

The Inter-American Statistical Training Center (CIENES) in Santiago, Chile, has openings for persons who wish to teach, beginning February or July 1965, in the fields of Statistics and/or Operations Research.

Candidates must have the equivalent of a M.S. or Ph.D. degree. Salaries start at \$8,998 (tax free) with substantial fringe benefits. Knowledge of Spanish is highly desirable, but not mandatory.

The program of instruction includes the following courses, among others: Theory of Probability, Statistical Inference, Statistical Decision Theory, Design and Analysis of Experiments, Multivariate Analysis, Statistical Linear Models, Sequential Analysis, Non-Parametric Methods, Sampling Methods, Quality Control, Stochastic Processes, Measure Theory, Theory of Games, Queueing Theory and Inventory Theory, Linear and Non-Linear Programming, Numerical Analysis.

For further details and application forms write to Tulo H. Montenegro, Secretary General, Inter-American Statistical Institute (IASI), Pan American Union, Washington, D.C. 20006.

---

### **THIRD INTERNATIONAL SYMPOSIUM ON THE THEORY OF ROAD TRAFFIC FLOW JUNE 21-23, 1965**

The Third International Symposium on the Theory of Road Traffic Flow, under the sponsorship of the Operations Research Society of America and the

International Federation of Operations Research Societies, will be held in New York, New York, U.S.A. on June 21 through June 23, 1965 at the United Engineering Center.

Road traffic scientists from all over the world are invited to contribute papers. This Third Symposium will continue to confine its attention to the scientific aspects of Road Traffic Theory as in the first two Symposia, the first of which was held in Detroit in 1959, and the second of which was held in London in 1963. Papers will be reviewed for acceptance to insure a program comprising the best experimental and theoretical work accomplished in the field. Only original research papers not published elsewhere will be eligible for consideration since, as in the past, papers presented at the Symposium will be published in the proceedings. The deadline for the submission of papers is March 1, 1965.

Papers should be sent to:

Mr. Richard Rothery, Secretary  
Transportation Science Section  
Operations Research Society of America  
% Department of Theoretical Physics  
General Motors Corporation  
12 Mile and Mound Road  
Warren, Michigan.

Questions concerning the arrangements for the symposium and invitations to participate may also be directed to Mr. Rothery.

---

### DOCTORAL DISSERTATIONS

Readers are invited to submit information about doctorates received during 1964 for inclusion in the list to appear in the April issue. The list gives the doctor's name, institution, major subject and title of dissertation. To be included, the information should reach the Editor by February 1, 1965.

---

### REPORT OF THE PRESIDENT FOR 1964

In the past year, the Institute of Mathematical Statistics has continued its steady growth in membership, in scholarly activity, and in national and international stature. As reported in detail by the other officers, the membership has increased by 22 %, the size of the Annals of Mathematical Statistics by 11½ %, and the number of meetings as well as the attendance at meetings have been growing at an impressive rate.

The Institute of Mathematical Statistics and, indeed, the scientific community at large, have suffered a shattering blow due to the untimely death of S. S. Wilks. A committee under the chairmanship of T. E. Harris is working on plans for establishing a fitting memorial.

On June 30, 1964, J. L. Hodges, Jr. concluded his term in office as Editor of the Annals of Mathematical Statistics. In the three years of his editorship, he continued the splendid tradition of the Annals, and all of us are grateful to him

for his tireless, generous and dedicated work. A committee under the chairmanship of W. H. Kruskal was charged with the task of selecting a new Editor. As a result of their efforts we now welcome D. L. Burkholder as the incoming Editor, and offer him our best wishes and whatever assistance each of us may be able to give.

With the growth of the *Annals* came an increase of the duties of the Editor which threatened to exceed the ability of a single person. A committee with T. E. Harris as chairman explored the problem of relieving the Editor of part of his burden and arrived at the conclusion that a new position of Managing Editor should be established. At their recommendation, Paul Meyer became the first Managing Editor of the *Annals* and began his term of office on July 1, 1964.

The Committee on Mathematical Tables under the chairmanship of D. B. Owen has formulated a specific program of publications. This program, when implemented, will constitute another publishing activity of the IMS, in addition to the *Annals of Mathematical Statistics* and the *IMS University of Chicago Statistical Monograph*.

As reported in detail by our Program Secretary, the IMS meetings in the past year have been most successful, and another European Regional meeting at Berne, Switzerland, was scheduled to take place September 14–16, 1964.

Continued liaison with other statistical societies has been maintained through the Committee of Presidents of Statistical Societies, and with other mathematical organizations through the Conference Board of Mathematical Sciences.

The continued growth of the IMS has been most gratifying and is indicative of the importance of its function and the recognition it has been receiving. This growth also raises some problems. The Institute is still, as in its beginnings, under the direction of elected officers and most of its activities are performed by members of committees who all serve without compensation, giving of their time as much as their professional activities may allow. It has become increasingly clear that this mode of operating cannot be continued indefinitely. It is my suggestion that a salaried executive will be needed to coordinate the Institute's activities, as they increase in size and complexity, and that much of the thinking of the Council and the officers in the near future may have to be devoted to this matter.

It would have been impossible for the Institute to function so successfully in the past year had it not been for the untiring efforts of its officers and committee chairmen and members. To all of them go my heartfelt thanks.

According to the IMS Constitution it is the duty of the retiring president to appoint a Nominating Committee and to announce their names at the Annual meeting. The Nominating Committee will consist of Ronald Pyke, chairman, Donald L. Burkholder, Dorothy M. Gilford, Anders Hald, J. L. Hodges, Jr., Murray Rosenblatt and L. K. Schmetterer.

It gives me great pleasure at this time to turn over the presidency to Herbert Solomon and to wish him a most successful and propserous year in office.

Z. W. BIRNBAUM

## REPORT OF THE TREASURER FOR 1964

During the last year, the membership of the Institute of Mathematical Statistics has grown substantially. There are currently 2636 U.S./Canada members and 443 from other countries. At the same time last year, there were 2056 U.S./Canada members and 463 from other countries. This represents a net increase of 460 or approximately a 20 % gain. As the size of the Institute grows, we face a transition from a small professional society to a medium-sized organization, with all the assorted growing pains. As a consequence of this, the Executive Committee authorized the auditors to mechanize our office operations. Our membership and subscriber lists are now on IBM cards and our accounting records are now automated. This was accomplished during the past year. Associated with the implementation of any new system are numerous problems. If any of our members were inconvenienced during this period, we sincerely apologize. However, they can be assured that, in the future, their requests will be handled quickly and efficiently.

The financial picture for the calendar year 1963 was very bright. For the first time since 1957, the Institute showed a surplus, the rather substantial amount of \$11,908.89. The specific details are given on the attached sheets. With the advent of our new accounting system, a better classification of our accounts is now available. This appears as Exhibit B, Statement of Operations for the Year Ended December 31, 1963. However, in order to compare the performance of the Institute with past years, a Revenue and Expense Summary is also given using the old classification of accounts. On the revenue side, there were several major disappointments. The income from page charges dropped below expectation. Whereas, returns ran approximately 80 % of the total pages in the 1962 volume of the *Annals*, the 1963 returns were only 43 %. The number of Institutional Members also ran below expectation. Both of these may be attributable to the general tightening of the research and industrial economy. Finally, the income from the sale of back issues of the *Annals* dropped below the budgeted figure. However, sales of back issues during the first six months of 1964 is already three times that of the entire year 1963, indicating that some of the 1963 receipts appeared in 1964. One gratifying source of revenue is in the sales of the *Index* to the *Annals*.

The 1964 expenses ran fairly close to the budgeted figures, with almost all the actual expenditures falling below the anticipated values.

An explanation of miscellaneous expenses is in order. Most of these expenses are attributed to accounting and auditing costs, IBM charges in connection with billing, mailing and maintaining records, and agency charges for handling some of our subscribers. These details appear in the aforementioned Exhibit B.

The 1964 financial outlook does not appear to be as bright as that in 1963. Preliminary budget estimates indicate that expenditures will exceed revenues slightly, primarily due to an expansion in the size of the *Annals*. Increased

membership, subscriptions, institutional members, and response to page charges are a necessity if the Institute is to continue to operate on a sound financial basis.

GERALD LIEBERMAN

# INSTITUTE OF MATHEMATICAL STATISTICS

## *Revenue and Expense Summary*

	1961 Actual	1962 Actual	1963 Estimated	1963 Actual
<b>Revenue</b>				
Dues, Individual (U.S. & Canada) . . .	\$16,711.28	\$17,538.50	\$27,000.00	\$27,640.00
Dues, Individual (Other) . . . . .	2,500.00	2,214.00	4,375.00	2,986.50
Dues, Institutional . . . . .	4,500.00	4,500.00	5,000.00	4,500.00
Subscriptions . . . . .	19,465.42	17,840.80	23,500.00	22,658.29
Investment Income . . . . .	4,052.23	3,299.19	3,000.00	2,652.35
Sale of back issues . . . . .	4,156.49	3,233.48	2,500.00	793.44
Page charges . . . . .	6,616.25	14,896.25	15,500.00	10,492.90
Other . . . . .	601.31	2,898.33	2,500.00	6,570.75
Total revenue . . . . .	\$58,602.98	\$66,420.55	\$83,375.00	\$78,294.23
<b>Expenses</b>				
Cost of Annals . . . . .	\$37,077.22	\$40,678.18	\$51,300.00*	\$44,001.81
Office salaries . . . . .	7,611.34	8,668.00	6,500.00	5,548.38
Payroll taxes . . . . .	299.74	82.85	—	—
Office expense . . . . .	2,564.82	2,102.20	2,100.00	1,810.97
Printing, Stationery, and Postage . . .	10,373.31	4,890.62	5,000.00	5,280.48
Editorial expense . . . . .	4,068.61	3,190.22	3,500.00	2,650.32
Travel and Meeting . . . . .	1,314.62	1,032.26	1,250.00	588.30
Binding expense . . . . .	129.00	211.00	150.00	—
Contributions to other organizations . .	1,500.00	1,610.00	1,600.00	1,600.00
Miscellaneous expenses . . . . .	197.62	4,436.64	4,000.00	4,905.08
Capital equipment . . . . .	488.80	—	—	—
Annals Index expense . . . . .	—	6,114.77	—	—
Total expense . . . . .	\$64,225.08	\$73,016.74	\$75,400.00	\$66,385.34
Excess expense over revenue . . . . .	5,622.10	6,596.19	(7,975.00)	(11,908.89)
Deficit (Surplus) . . . . .	\$5,622.10	\$6,596.19	(\$7,975.00)	(\$11,908.89)

\* Includes \$7,300.00 reprinting of *Annals*.

# INSTITUTE OF MATHEMATICAL STATISTICS

Exhibit A

## *Balance Sheet*

*December 31, 1963*

## *Assets*

### Current Assets:

Cash in bank—checking accounts . . . . .	\$33,325.03
Cash in bank—savings accounts . . . . .	36,936.13
Investments—U.S. Government bonds at cost . . . . .	7,000.00

## Receivables:

Dues.....	\$22,189.00	
Subscriptions.....	6,903.70	
Back issues of <i>Annals</i> .....	1,880.60	
Sales of indexes.....	643.00	
	<hr/>	
Total receivables.....		31,616.30
Inventory—at cost:		
<i>Annals</i> .....	33,957.69	
Index.....	6,668.48	
	<hr/>	
Total inventory.....		40,626.17
Balance due on N.S.F. Grants—Note 1.....		31,417.45
		<hr/>
Total assets.....		<u>\$180,921.08</u>

*Liabilities, Deferred Income, Unexpended Grant and Surplus*

## Current Liabilities:

Accounts payable.....	\$17,576.77	
Dues advanced by members.....	113.50	
Advances on subscriptions for 1964.....	11,296.93	
Wald royalties payable.....	106.40	
Collections for <i>Biometrika</i> .....	1,364.50	
	<hr/>	
Total.....		\$30,458.10
Deferred income—membership billings for 1964.....		34,149.00
Unexpended Grant from National Science Foundation—Note 1.....		35,828.24
Surplus—Exhibit C.....		80,485.74
		<hr/>
Total liabilities, deferred income, unexpended grant and surplus...		<u>\$180,921.08</u>

## INSTITUTE OF MATHEMATICAL STATISTICS

Exhibit B

*Statement of Operations**For the Year Ended December 31, 1963*

## Income:

Dues.....	\$35,126.50	
Subscriptions.....	22,658.29	
Sales of back issues of <i>Annals</i> .....	\$2,156.29	
Less cost of back issues sold.....	1,362.85	
	<hr/>	
Net.....		793.44
Sales of indexes.....	\$4,052.00	
Less cost of indexes sold.....	1,478.40	
	<hr/>	
Net.....		2,573.60
Advertising.....	588.75	
Page charges.....	10,492.90	
Interest on investments and savings accounts.....	2,652.35	
Miscellaneous income.....	3,408.40	
	<hr/>	
Total income.....		\$78,294.23

## Expenses:

## Publication expense:

Printing of <i>Annals</i> .....	\$41,616.19
Maintenance and shipping of <i>Annals</i> .....	2,385.62
Editorial expense .....	2,650.32
Maintenance and shipping of indexes .....	<u>261.96</u>

Total ..... \$46,914.09

## Treasurer and Secretary's office:

Salaries .....	5,548.38
Bookkeeping .....	285.00
Stationery and supplies .....	1,089.39
Postage .....	646.20
Telephone and cable .....	1,002.22
IBM charges .....	1,040.90
Miscellaneous .....	<u>486.33</u>

Total ..... 10,098.42

## General expense:

Agency charges .....	978.00
Special printing and mailings .....	805.78
Travel .....	439.60
Accounting .....	1,775.00
Contributions to other organizations .....	1,600.00
Meeting expense .....	2,925.23
Miscellaneous .....	<u>849.22</u>

Total ..... 9,372.83

Total expense ..... 66,385.34  
 Operating profit—to Exhibit C ..... \$11,908.89

## INSTITUTE OF MATHEMATICAL STATISTICS

Exhibit C

*Statement of Changes in Surplus**For the Year Ended December 31, 1963*

Surplus, January 1, 1963 ..... \$68,576.85  
 Add operating profit for the year ended December 31, 1963—Exhibit B. .... 11,908.89

Surplus, December 31, 1963—Exhibit A ..... \$80,485.74

*Changes in Allocated Surplus*

	Reserve for Life Members	Reserve for Replacement of Annals	General Purposes
Balance, January 1, 1963 .....	\$2,757.50	\$25,942.84	\$39,876.51
Operating profit .....			11,908.89
Reduction of reserve for replacement of Annals—Note 2 .....		(8,330.33)	8,330.33
Balance, December 31, 1963 .....	<u>\$2,757.50</u>	<u>\$17,612.51</u>	<u><u>\$60,115.73</u></u>



# INSTITUTE OF MATHEMATICAL STATISTICS

## Notes to Financial Statements

December 31, 1963

Note 1. The National Science Foundation granted the Institute the following:

Grant No. GE-240—Visiting Scientist (College).....	\$40,000.00
Grant No. GP-628—1963 Summer Institute.....	33,700.00

### Grant No. GE-240

The Visiting Scientist grant covers a three year period beginning on 9/1/63. Expenditures to 12/31/63 were as follows:

Honorarium.....	\$1,900.00
Travel.....	1,692.82
Other direct costs:	
Printing.....	\$458.77
Mailing.....	34.42
Other.....	85.75
	<u>578.94</u>
Total.....	<u>\$4,171.76</u>

To date, \$11,500.00 has been received from N. S. F.

### Grant No. GP-628

Expenditures for the Summer Institute were as follows:

Stipends.....	\$7,298.00
Travel:	
Foreign.....	\$2,280.21
Senior.....	664.25
Junior.....	1,761.66
	<u>4,706.12</u>
Total.....	4,706.12
Subsistence.....	9,139.80
Pre-publication and editorial.....	464.91
Secretary.....	758.02
Brochures and postage.....	170.18
Indirect costs.....	617.92
	<u>23,154.95</u>
Total.....	23,154.95
Additional allowance for indirect costs.....	2,762.50
	<u>\$25,917.45</u>
Total.....	<u>\$25,917.45</u>

According to the terms of the grant, the Institute is allowed to charge 15% of direct costs for indirect costs. The additional \$2,762.50 is reported on Exhibit B as part of miscellaneous income. The Institute has received \$23,000.00.

The balance due of \$31,417.45 is computed as follows:

GE-240:	
Original grant.....	\$40,000.00
Less cash received.....	11,500.00
	<u>\$28,500.00</u>
Balance.....	\$28,500.00
GP-628:	
Total allowable expenditures.....	\$25,917.45
Less cash received.....	23,000.00
	<u>2,917.45</u>
Balance.....	2,917.45
	<u>\$31,417.45</u>
Total.....	<u>\$31,417.45</u>

The liability of \$35,828.24 is computed as follows:

GE-240:

Original grant.....	\$40,000.00
Less expenditures.....	4,171.76
	<hr/>
Unexpired grant.....	<u>\$35,828.24</u>

Note 2. The reserve for replacement of *Annals* issued is computed as follows:

Estimated cost to reprint 300 copies each of Volume 1 through 34.....	\$51,570.20
Less inventory of back issues at December 31, 1963 (see Exhibit A) which is covered by insurance.....	33,957.69
	<hr/>
Reserve necessary at December 31, 1963.....	<u>\$17,612.51</u>

During 1960 and 1961 a special study was made by the Finance Committee on the policy of maintaining a reserve to replace the back issues of *Annals* in case of fire or other emergency which would destroy the entire inventory. It was recommended (among other things) that the reserve be adjusted to reflect the amount necessary to reprint 300 copies of each issue of *Annals*. This report was adopted at the Twenty-fourth Annual Meeting along with the report of other standing committees.

The estimated cost to reprint was obtained from figures supplied by Cushing-Malloy, the firm that is currently reprinting specific issues of *Annals* as required. The reduction factor is the cost of the issues on hand at December 31, even though there is some indication that the group policy coverage furnished by Waverly Press, Inc., might base its reimbursement on expected sales value.

---

### REPORT OF THE EDITOR FOR 1964

In 1960 the *Annals* entered a period of rapid growth, at an average rate of ten percent a year. The 1964 volume is twelve percent larger than its predecessor. The number of submissions (306) in the year ending 30 June 1964 was sixteen percent higher than in the preceding year, which indicates that the rapid growth is continuing.

This large size has compelled the Council to make some structural changes. The functions of editing and publishing, hitherto both performed by the Editor, have been separated. Professor D. L. Burkholder has been elected Editor, with responsibility for editing the manuscripts submitted after 30 June 1964. Professor P. L. Meyer has been elected to the new post of Managing Editor, and is responsible for publishing the *Annals*, effective with the current issue. In order to keep the issues of manageable size, the *Annals* will appear bimonthly, beginning with the February 1965 issue.

The Institute is indebted to the University of California, Berkeley, for a great deal of direct and indirect support provided to the Editor's Office during the last three years. Mrs. Vincent Rizzolo and Mrs. LeRoy Blomgren have continued their intelligent, cheerful and conscientious attention to the multifarious details involved in putting out a large journal. As always, our relations with Waverly Press have been excellent.

The 1961-1964 Editorial Board will be responsible for editing all papers sub-

mitted before 1 July 1964. I wish to express my deep appreciation to the distinguished scholars who are serving as Associate Editors on this Board. In the face of a rapidly increasing flow of submissions, they and their referees have performed their work so expeditiously that the time from original submission to publication has been considerably reduced. In the 1964 volume, the quartiles of the distribution of this time are 9.2, 11.8, and 16.2 months. This is the first volume, at least in our recent history, in which more than half of the papers appeared within a year of submission. The speed-up of publication has of course tended to inflate the *Annals* growth rate, but this effect has been largely offset by a decrease in the fraction of submitted papers that are accepted. The 1961–1964 Board is accepting approximately 55 percent of papers submitted to it.

With some three hundred manuscripts to judge each year, ranging over a wide spectrum of highly technical fields, the Editorial Board must rely on the willingness of a large number of scholars to serve as referees. The quality of our journal is heavily dependent on the expertness, conscientiousness and speed of their work. We wish to thank the following, many of whom have considered more than one manuscript.

J. L. HODGES, JR.  
*Editor, 1961–1964*

Abrahamson, I. G.	Burkholder, D. L.	Elliott, Joanne
Ajne, Björn	Capon, Jack	Ellison, Bob E.
Albert, Arthur	Carlborg, Frank	Epstein, Benjamin
Anderson, T. W.	Chernoff, Herman	Farrell, Roger H.
Anscombe, F. J.	Chitgopekar, S. S.	Feldman, J.
Askey, Richard A.	Chow, Y. S.	Ferguson, Thomas S.
Bahadur, R. R.	Clatworthy, Willard H.	Fisz, Marek
Bargmann, Rolf	Cogburn, Robert	Fox, Charles
Barlow, Richard E.	Cohen, A. C., Jr.	Fraser, D. A. S.
Barndorff-Nielsen, Ole	Conner, Howard E.	Freedman, David A.
Bartholomew, D. J.	Constantine, A. G.	Gardner, L. A., Jr.
Barton, D. E.	Craswell, Keith J.	Gani, Joseph M.
Bartoo, James B.	Curnow, R. N.	Gastwirth, J. L.
Baxter, Glen	Dalenius, Tore	Gaver, Donald P., Jr.
Beale, E. M. L.	Daniels, H. E.	Ghosh, Sakti P.
Bell, C. B.	Das Gupta, Somesh	Golub, Gene
Berman, Simeon M.	David, F. N.	Good, I. J.
Bickel, Peter J.	David, Herbert T.	Goodman, Leo A.
Billingsley, Patrick	DeGroot, Morris H.	Goodman, N. R.
Birnbaum, Allan	Derman, Cyrus	Graham, R. L.
Blackwell, David	Draper, N. R.	Gumbel, E. J.
Blum, J. R.	Dubins, Lester E.	Gurland, John
Blumenthal, R. M.	Dudman, Jack	Gurney, Margaret
Blumenthal, Saul	Duncan, D. B.	Hájek, Jaroslav
Breiman, Leo	Dunnett, Charles W.	Hall, W. J.
Brillinger, D. R.	Dwass, Meyer	Halperin, Max
Brookhouse, John	Efron, Bradley	Han, Chien-pai
Brown, Lawrence	Ehrenfeld, Sylvain	Hanani, Haim
Brunk, H. D.	Elashoff, Robert M.	Hanš, Otto

Hanson, D. L.	Mitra, Sujit Kumar	Saw, John G.
Harris, Bernard	Moon, John W.	Schaufele, Ronald A.
Harris, T. E.	Moser, Joseph M.	Scheffé, Henry
Harter, H. Leon	Moses, Lincoln E.	Searle, S. R.
Healy, M. J. R.	Mosteller, Frederick	Seiden, Ester
Healy, William C., Jr.	Mullikin, T. W.	Shah, B. V.
Hext, George	Nelder, J. A.	Sherman, Ellen
Hoeffding, Wassily	Newell, G. F.	Sherman, Seymour
Hoffman, Alan J.	Ney, P. E.	Siddiqui, M. M.
Hogg, Robert V.	Neyman, J.	Silvey, S. D.
Hooke, Robert	Niven, Ivan	Smith, C. A. B.
Huber, Peter J.	Noether, Gottfried E.	Smith, W. L.
Iglehart, D. L.	Offord, A. C.	Solomon, Herbert
Isbell, John	Ogawa, J.	Spitzer, Frank
Ito, Kiyosi	Olkin, Ingram	Sprott, D. A.
James, Alan T.	Page, E. S.	Stacy, E. W.
John, Peter W. M.	Parzen, Emanuel	Steck, G. P.
Johns, M. V., Jr.	Pathak, P. K.	Stein, Charles M.
Johnson, N. L.	Patil, G. P.	Stone, M. H.
Jones, Richard H.	Patterson, H. D.	Strassen, V.
Katz, Melvin L.	Paulson, Edward	Studden, William
Kempthorne, Oscar	Pinkham, Roger	Takács, Lajos
Kesten, Harry	Plackett, R. L.	Taylor, William F.
Klotz, Jerome	Prabhu, N. U.	Terry, Milton E., Jr.
Konijn, H. J.	Pratt, John W.	Thompson, Donovan J.
Kshirsagar, A. M.	Priestley, M.	Tjoe-Tie, Teh
Lamperti, John	Proschan, Frank	Tocher, K. D.
Laurent, Andre G.	Pruitt, William E.	Truax, Donald R.
LeCam, Lucien	Quenouille, M. H.	Tucker, Howard G.
Levene, Howard	Raghavachari, M.	Uzawa, Hirofumi
Lewis, P. A. W.	Raiffa, Howard	van Eeden, Constance
Lindley, D. V.	Raj, Des	Wasow, Wolfgang
Loève, M.	Rao, Sudarsana	Watson, G. S.
Loynes, R. M.	Richter, Donald	Weiss, Lionel
Lukacs, Eugene	Robson, D. S.	Welch, Peter D.
Mallows, C. L.	Rosenblatt, Judah	Wijsman, R. A.
Mehra, Krishen L.	Ruben, Harold	Wolfowitz, J.
Mesner, Dale M.	Russell, Bradley	Woll, John
Mijares, Tito A.	Sacks, Jerome	Yeo, G.
Miller, H. D.	Savage, I. R.	Zyskind, George

## REPORT OF THE AMHERST, MASSACHUSETTS MEETING OF THE INSTITUTE OF MATHEMATICAL STATISTICS

The 27th annual meeting, and 101st meeting, of the Institute of Mathematical Statistics was held at the University of Massachusetts, Amherst, Massachusetts on August 26–29, 1964 in conjunction with summer meetings of the American Mathematical Society, the Mathematical Association of America, the Society for Industrial and Applied Mathematics, and other related groups.

E. L. Lehmann, University of California, Berkeley, delivered the Wald Memorial Lectures on *Topics in Non-Parametric Statistics*.

There was a total of 1499 persons registered for the meetings. Of this number, 317 were members of the Institute.

---

### Program

Wednesday, August 26, 1964

#### 9:00 a.m.—10:30 a.m.—Design of Experiments

Chairman: H. B. MANN, Army Research Centre, Madison.

*Error Correcting Codes and Fractional Factorial Designs*, R. C. BOSE, University of North Carolina.

Invited Discussants: D. K. RAY-CHAUDHURI, IBM Research Center

J. SRIVASTAVA, University of Nebraska

#### 11:00 a.m.—12:30 p.m.—Inference I

Chairman: I. OLKIN, Stanford University

*Asymptotically Optimal Tests for Multinomial Distributions*, W. HOEFFDING, University of North Carolina.

Invited Discussants: H. CHERNOFF, Stanford University

J. NEYMAN, University of California, Berkeley

#### 2:00 p.m.—3:45 p.m.—Contributed Papers I

Chairman: R. A. WIJSMAN, University of Illinois

1. *Some Test Functions for the Parameters of the Weibull Distributions*, S. D. DUBEY, Procter & Gamble Co.
2. *Maximum Likelihood Estimation of the Parameters of the Beta Distribution from Smallest Order Statistics*, R. GNANADESIKAN, R. S. PINKHAM and L. P. HUGHES, Bell Telephone Laboratories, Inc.
3. *Expected Values of Exponential, Weibull, and Gamma Order Statistics*, H. L. HARTER, Wright-Patterson Air Force Base.
4. *Efficiency of Some Rank-Based Estimates for Normal Samples of Moderate Size*, J. L. HODGES, JR., University of California, Berkeley.
5. *Applications of the Characterizations of Distributions to Tests of Fit, Randomness, and Independence*, R. V. HOGG, University of Iowa.
6. *A Modification of Kendall's Rank Correlation Measure* (Preliminary Report), K. K. MAZUY and E. C. VENEZIAN, Arthur D. Little, Inc.
7. *Scale Parameter Estimation from the Order Statistics of Unequal Gamma Components*, M. B. WILK, R. GNANADESIKAN and E. LAUH, Bell Telephone Laboratories, Inc.

#### 2:00 p.m.—3:45 p.m.—Contributed Papers II

Chairman: J. LAMPERTI, Dartmouth College

1. *Extremal Processes II*, M. DWASS, Northwestern University.
2. *A Non-Linear Integral Equation and its Application to Critical Branching Processes* (Preliminary Report), J. CHOVER, University of Wisconsin, and P. E. NEY, Cornell University.
3. *On the Convergence Rate in the Law of Large Numbers for Linear Combinations of Independent Random Variables*, D. L. HANSON, University of Missouri and Sandia Corporation, and L. H. KOOPMANS, Sandia Corporation.
4. *Convergence Rates for Linear Combinations of Exchangeable Random Variables*, D. L. HANSON, University of Missouri and Sandia Corporation, and L. H. KOOPMANS, Sandia Corporation.
5. *Limit Theorems for Queues with Traffic Intensity One*, D. L. IGLEHART, Cornell University.
6.  $\Phi$ -*Distinguishability of Families of Distributions*, H. S. KONIJN, The City College of New York.

7. *On the Probability of Large Deviations of the Mean for Random Variables in  $D[0,1]$* , J. SETHURAMAN, Michigan State University.

**4:00 p.m.-4:50 p.m.—Joint IMS-MAA Lecture**

Chairman: Z. W. BIRNBAUM, University of Washington

*Statistical Inference and Stochastic Processes*, J. R. BLUM, University of New Mexico.

**Thursday, August 27, 1964**

**8:30 a.m.-10:00 a.m.—Probability I**

Chairman: C. F. KOSSACK, Graduate Research Center of the Southwest

1. *Limit Distributions of the Minimax of Matrices of Independent, Identically Distributed Random Variables*, H. TEICHER, Purdue University.
2. *Some Curve-Crossing Problems for Normal Processes*, R. LEADBETTER, Research Triangle Institute.

**8:30 a.m.-9:20 a.m.—Contributed Papers III**

Chairman: G. OAKLAND, University of Massachusetts

1. *On the Selection of the First Sample Size in Some Two-Stage Sampling Problems*, A. GOLDMAN, University of California, Los Alamos.
2. *A Symmetric Stopping Rule and its Applications to Probability Sampling*, P. K. PATHAK, University of Illinois (Introduced by J. L. DOOB).
3. *Allocation in Multivariate and Analytical Surveys*, S. CHATTERJEE, Harvard University.
4. *Bias of the Characteristic Roots of a Random Matrix*, T. CACOULLOS, University of Minnesota, and I. OLKIN, Stanford University.
5. *A Characterization of the Logarithmic and Geometric Distributions*, V. SESHADRI, McGill University.

**10:20 a.m.-11:20 a.m.—Wald Lecture I**

Chairman: J. L. HODGES, JR., University of California, Berkeley

*Topics in Non-Parametric Statistics*, E. L. LEHMANN, University of California, Berkeley.

**11:40 a.m.-12:30 p.m.—Probability II**

Chairman: T. E. HARRIS, RAND Corporation

*Some New Results in Branching Processes*, S. KARLIN, Stanford University.

**2:00 p.m.-3:00 p.m.—A.M.S. Special Address**

*Function Spaces*, A. SARD, City University of New York.

**3:15 p.m.-5:30 p.m.—Probability III**

Chairman: L. J. SNELL, Dartmouth College

1. *Self-Avoiding Walks*, H. KESTEN, Cornell University.
2. *Renewal Theory for Vector Valued Random Walks*, R. H. FARRELL, Cornell University.
3. *Some Operator Limit Theorems and Their Applications*, D. L. BURKHOLDER, University of Illinois.

**3:15 p.m.-4:05 p.m.—Contributed Papers IV**

Chairman: H. D. BRUNK, University of Missouri

1. *Sufficiency for Independent Variables*, D. A. S. FRASER, University of Toronto.
2. *Some Remarks on the "Joint-Ranking" Procedure*, K. L. MEHRA, University of Alberta.
3. *The Combination of Unbiased Estimators Having Variances in Unknown Ratios*, P. S. LEVY, The Johns Hopkins University.
4. *Best Sequential Tests of an Identification Hypothesis in a Degenerate Case* (Preliminary Report), S. BLUMENTHAL, T. CHRISTIE, Rutgers University and M. SOBEL, University of Minnesota.

**4:15 p.m.-5:30 p.m.—Inference II**

Chairman: R. V. HOGG, University of Iowa

1. *A Statistical Inference Theory for Incompletely Specified Models*, T. A. BANCROFT, Iowa State University.

2. *Inference for Incompletely Specified Models in Life Testing*, D. O. RICHARDS, Brigham Young University.

7:30 p.m.—1964 Council Meeting—Institute of Mathematical Statistics

Friday, August 28, 1964

8:30 a.m.—9:20 a.m.—Probability IV

Chairman: D. L. HANSON, University of Missouri

*Some Aspects of Convergence of Random Processes*, J. LAMPERTI, Dartmouth College.

8:30 a.m.—9:20 a.m.—Contributed Papers V

Chairman: T. A. BANCROFT, Iowa State University

1. *Missing Values in Multiple Regression*, A. AFIFI and R. M. ELASHOFF, University of California, Berkeley.
2. *A Class of Tests with Monotone Power Functions for Two Problems in Multivariate Statistical Analysis*, G. S. MUDHOLKAR, University of Rochester.
3. *Exact Distributions of Wilks's Criterion* (Preliminary Report), M. SCHATZOFF, IBM Research Center and Harvard University.
4. *Classification into Multivariate Normal Populations when the Population Means are Linearly Restricted*, M. S. SRIVASTAVA, Stanford University and University of Toronto.

9:30 a.m.—10:20 a.m.—Wald Lecture II

Chairman: T. W. ANDERSON, Columbia University

*Topics in Non-Parametric Statistics*, E. L. LEHMANN, University of California, Berkeley.

10:45 a.m.—12:30 p.m.—Probability V

Chairman: D. A. DARLING, University of Michigan

1. *Additive Functionals and Excessive Functions*, R. GETTOOR, University of Washington.
2. *Boltzmann's Equation and the Propagation of Chaos*, H. MCKEAN, Massachusetts Institute of Technology.

10:45 a.m.—12:30 p.m.—Contributed Papers VI

Chairman: P. L. MEYER, Washington State University

1. *Sequential Life Tests with Piecewise Constant Failure Rates*, L. A. AROIAN and D. E. ROBISON, Space Technology Laboratories, Inc.
2. *A Bayes Sequential Sampling Inspection Plan*, H. CHERNOFF and S. N. RAY, Stanford University.
3. *On the Compound Testing Problem for Two Specified Distributions*, J. F. HANNAN, Michigan State University, and J. R. VAN RYZIN, Argonne National Laboratory.
4. *Existence of Optimal Estimators Relative to Convex Loss*, M. M. RAO, Carnegie Institute of Technology.
5. *Bounds on the Maximum Sample Size of a Bayes Sequential Procedure*, S. N. RAY, Stanford University.
6. *Bayesian Estimation in Multivariate Analysis*, S. GEISSER, National Institutes of Health.
7. *Exact Lower Confidence Bounds for Reliability When Failure Times Have the Two-Parameter Weibull Distribution*, N. R. MANN, Rocketdyne, North American Aviation, Inc.

1:30 p.m.—3:00 p.m.—Design and Analysis of Experiments

Chairman: R. BECHHOFFER, Cornell University

*The Current Status of the Design and Analysis of Experiments*, O. KEMPTHORNE, Iowa State University.

Invited Discussants: R. C. BOSE, University of North Carolina

M. B. WILK, Bell Telephone Laboratories

1:30 p.m.—3:00 p.m.—Contributed Papers VII

Chairman: D. L. BURKHOLDER, University of Illinois

1. *A Birth-Illness-Death Process*, C. L. CHIANG, University of California, Berkeley.

2. *A Model for Phage Attachment to Bacteria with Death and Reproduction*, J. M. GANI, Michigan State University, and T. NAGAI, Kyushu University.
3. *Clusters in a Poisson Process*, M. V. MENON, IBM Research Center.
4. *The Distribution of the Size of the Maximum Cluster of Points Drawn from a Non-Uniform Distribution*, J. I. NAUS, Institute of Naval Studies, The Franklin Institute.
5. *The Modal Number of Successes in Independent Trials* (Preliminary Report), S. M. SAMUELS, Purdue University.
6. *On an Upper Bound for the Maximum Number of Points No Four On One Plane in PG(r, 2)* (Preliminary Report), E. SEIDEN, Michigan State University.

### 3:15 p.m.-5:15 p.m.—Inference III

Chairman: F. MOSTELLER, Harvard University

*Bayesian and Non-Bayesian Decision Theory—a Comparative Evaluation*

Principal Speakers: L. J. SAVAGE, University of Michigan

L. LECAM, University of California, Berkeley

Invited Discussants: F. ANSCOMBE, Yale University

C. STEIN, Stanford University

W. KRUSKAL, University of Chicago

5:20 p.m.—Business Meeting—Institute of Mathematical Statistics

8:00 p.m.—1965 Council Meeting—Institute of Mathematical Statistics

## Saturday, August 29, 1964

### 8:30 a.m.-10:30 a.m.—Inference IV

Chairman: T. S. FERGUSON, University of California, Los Angeles

1. *Admissibility of Translation Parameter Estimates*, L. BROWN, Cornell University.
2. *Admissibility of Certain Multivariate Tests*, R. SCHWARTZ, Cornell University and General Electric Company.
3. *Conditions for Admissibility of Formal Bayes Procedures*, C. STEIN, Stanford University.

### 8:30 a.m.-10:00 a.m.—Contributed Papers VIII

Chairman: L. H. KOOPMANS, Sandia Corporation

1. *On Estimating the Frequency of a Sinusoid in the Presence of Noise*, A. ALBERT, ARCON Corporation.
2. *A New Approach to Time Series with Mixed Spectra*, G. R. HEXT, Stanford University.
3. *Large-Sample Estimation of an Unknown Discrete Waveform which is Randomly Repeating in Gaussian Noise*, M. HINICH, Carnegie Institute of Technology.
4. *Consistent Estimation of Sum of Squares of Jumps for a Spectrum and a Probability Distribution*, V. K. MURTHY and P. M. GLUCKMAN, Douglas Aircraft Company, Inc.
5. *Spectral Analysis of a Class of Non-Stationary Stochastic Processes*, V. K. MURTHY and P. M. GLUCKMAN, Douglas Aircraft Company, Inc.
6. *Spectral Analysis with Randomly Missed Observations: The Binomial Case*, P. A. SCHEINOK, Hahnemann Medical College.

### 10:50 a.m.-11:40 a.m.—Wald Lecture III

Chairman: Z. W. BIRNBAUM, University of Washington

*Topics in Non-Parametric Statistics*, E. L. LEHMANN, University of California, Berkeley.

### 12:50 p.m.-1:40 p.m.—Probability VI

Chairman: R. PYKE, University of Washington

*Conditional Expectation Given a  $\sigma$ -lattice and Applications*, H. D. BRUNK, University of Missouri.

### 12:50 p.m.-2:15 p.m.—Contributed Papers IX

Chairman: V. P. GODAMBE, Canadian Bureau of Statistics

1. *On the Line Graph of a Symmetric Balanced Incomplete Block Design*, A. J. HOFFMAN and D. K. RAY-CHAUDHURI, IBM Research Center.



2. *A Model for the Distribution of Individuals by Species in an Environment* (Preliminary Report), J. W. McCLOSKEY, Michigan State University.
3. *Multi-Decision Sequential Procedures* (Preliminary Report), W. D. LAWING, JR., and H. T. DAVID, Iowa State University.
4. *Unbiased Coin-Tosses With a Biased Coin*, J. A. LECHNER, Westinghouse Corporation.
5. *Some Properties of the Dependence Capacity of a Stochastic Process*, J. G. BALDWIN, Research Triangle Institute.
6. *On the Local and Asymptotic Minimax Tests of a Multivariate Problem*, N. C. GIRI, Cornell University.

2:00 p.m.-3:45 p.m.—Inference V

Chairman: F. MOSTELLER, Harvard University

*Bayesian and Non-Bayesian Decision Theory—a Comparative Evaluation*, L. LECAM, University of California, Berkeley, and L. J. SAVAGE, University of Michigan.

1. Open Discussion.
2. Responses by the Principal Speakers.

#### Contributed Papers by Title

1. *A Characterization of the Geometric Distribution*, V. R. RAO UPPULURI, Oak Ridge National Laboratory.
2. *Small Sample Tests for the Mean and Variance of the Weibull Distribution*, S. D. DUBEY, Procter & Gamble Co.
3. *Estimation of Response Function in a Dynamic Regression Model*, Z. GOVINDARAJULU and Y. SUZUKI, Case Institute of Technology.
4. *A Note on Moments of Gamma Order Statistics*, P. R. KRISHNAIAH and M. H. RIZVI, Wright-Patterson Air Force Base.
5. *Asymptotic Properties of an Age-Dependent Branching Process*, H. WEINER, University of California, Berkeley.
6. *Renewal Theory in the Plane* (Preliminary Report), J. A. YAHAV and P. J. BICKEL, University of California, Berkeley.
7. *Alternative Analyses of Contingency Tables* (Preliminary Report), J. J. GART, The Johns Hopkins University.
8. *On Confidence Bounds Associated with Manova and Non-Independence Between Two Sets of Variates*, G. S. MUDHOLKAR, University of Rochester.
9. *A Note on the Distinct Score Sequences of a Round Robin Tournament* (Preliminary Report), T. V. NARAYANA and J. SARANGI, University of Alberta.
10. *The Single Server Queue with Poisson Input and Semi-Markov Service Times I*, M. F. NEUTS, Purdue University.
11. *The Single Server Queue with Poisson Input and Semi-Markov Service Times II*, M. F. NEUTS, Purdue University.
12. *On a Multivariate Fisher's Z* (Preliminary Report), T. CACOULLOS, University of Minnesota.

SAMUEL W. GREENHOUSE  
Associate Secretary

---

## REPORT OF THE BERNE MEETING OF THE INSTITUTE OF MATHEMATICAL STATISTICS

The 102nd meeting of the Institute of Mathematical Statistics was held at The Institute for Exact Sciences, Sidlerstrasse 5, Berne, Switzerland, on September 14-16, 1964. The last two days of the meeting were held in conjunction with the first two days of a three-days meeting of the International Association for Statistics in Physical Sciences.

There were 202 participants registered of which 78 were members of the IMS.

### Programme

Monday, September 14, 1964

#### 9:30 a.m.—Invited Papers on Statistical Inference

Chairman: J. DURBIN, London School of Economics.

1. *Axioms for Statistical Evidence: Further Mathematical and Interpretive Considerations*, A. BIRNBAUM, New York University.
2. *Mean Values and Estimation*, H. BRØNS, University of Copenhagen.
3. *Construction of Best Asymptotic Normal Estimators*, J. STENE, The Danish Institute for Educational Research, Copenhagen.
4. (Contributed Paper) *Exact Probability Distribution Functions of Some Renyi Type Statistics*, H. CSÖRGÖ, Princeton University.

#### 2:15 p.m.—Invited Papers on Non-parametric Methods

Chairman: E. NIEVERGELT, Control Data Corporation, Zürich

1. *Theory of Robust Methods*, P. HUBER, Federal Institute of Technology, Zürich.
2. *Pairwise Comparison*, H. BÜHLMANN, Swiss Reinsurance Company, Zürich.
3. *The Difference Between Empirical and Theoretical Distribution Functions*, W. NEF, University of Berne. (By title).
4. *A First-Passage Time Problem in Chemical Engineering*, P. NAOR, Israel Institute of Technology, Haifa, and University of North Carolina.

#### 5:00 p.m.—Business Meeting of IMS Committee on the European Region.

Tuesday, September 15, 1964

#### 9:30 a.m.—Invited Papers on Probability

Chairman: H. E. DANIELS, University of Birmingham

1. *Variational Methods for Multi-dimensional Random Walks*, J. KEILSON, Sylvania Electronics Systems, Massachusetts.
2. *A Structure Theorem for Infinitely Divisible Non-stationary Point Processes*, P. LEE, University of Cambridge.
3. *Mixing Sequences of Events*, J. NEVEU, University of Paris.
4. *Invariant Measures for Transformations and Markov Processes*, L. SUCHESTON, Ohio State University.

#### 2:15 p.m.—Contributed Papers I

Chairman: E. LYKKE JENSEN, The Copenhagen School of Economics and Business Administration

1. *Dynamic Programming for Countable State Systems*, A. MAITRA, University of Copenhagen.
2. *The Effective Use of Quadratic Programming Methods in Some Statistical Problems*, P. NÜESCH, Kantonale Oberrealschule, Zurich.
3. *L'application du théorème de Bayes aux processus de comportement adaptatif* (The Application of Bayes Theorem to the Adaptive Control Processes), J. TORRENS-IBERN, Escuela Superior de Ingenieros Industriales, Barcelona.
4. *Random Graphs and Digraphs*, T. N. BHARGAVA, Kent State University, and S. D. CHATTERJI, University of Heidelberg.
5. *On the Estimation of Missing Elements of a Markov Chain*, R. H. RIFFENBURGH, University of Connecticut.
6. *Some Remarks on Ballot Problems*, F. GÖBEL, Mathematical Centre, Amsterdam.
7. *A Generalization of the Martingale Convergence Theorem*, S. JOHANSEN, University of Copenhagen.
8. *A Sequential Signed Rank Procedure*, E. A. PARENT, Stanford University and U. S. Navy.

#### 2:15 p.m.—Contributed Papers II

Chairman: A. LINDER, University of Geneva

1. *Confidence Region Tests*, J. AITCHINSON, University of Liverpool.

2. *Simultaneous Test Procedures*, K. R. GABRIEL, Hebrew University, Jerusalem.
3. *Optimal One-Sample Distribution-Free Tests and Their Two-Sample Extension*, C. B. BELL, San Diego State College and K. DOKSUM, University of California, Berkeley.
4. *Exact Power of Some Rank Tests*, P. VAN DER LAAN, Mathematical Centre, Amsterdam.
5. *Some Distribution-Free k-Sample Rank Tests of Homogeneity Against Ordered Alternatives*, M. L. PURI, New York University.
6. *Ranking and Selection Problems of Uniform Distributions*, D. R. BARR and M. HASEEB RIZVI, Aerospace Research Laboratories, Wright-Patterson AFB, Ohio.
7. *Statistical Problems in Interpretation in Factor Analysis*, A. E. MAXWELL.
8. *Asymptotic Efficiency of Certain Distance Criteria*, F. C. ANDREWS, Univ. of Oregon, and K. JOGDEO, Mathematical Centre, Amsterdam.

#### 2:15 p.m.—Contributed Papers III

Chairman: E. SPARRE ANDERSEN, University of Aarhus

1. *Variance of Mean Estimators when Some Observations are Stragglers*, F. GEBHARDT, University of Connecticut.
2. *Convex Transformations: A New Approach to Skewness and Kurtosis*, W. R. VAN ZWET, Mathematical Centre, Amsterdam.
3. *Some Statistical Characteristics of a Peak to Average Ratio*, M. MORRISON and F. TOBIAS, Mathematical Analysis Section ITT, Data Information Systems Division, New Jersey.
4. *On the Selection of Independent Variables in a Regression Equation*, J. OOSTERHOFF, Mathematical Centre, Amsterdam.
5. *Covariance Estimation for Linear Time Series under Minimal Assumptions*, F. EICKER, University of Freiburg.
6. *On the Block Structure of Singular Group Divisible Partially Balanced Incomplete Block (SGDPBIB) Designs*, C. H. KAPADIA, Southern Methodist University.
7. *Sampling with or without Replacement*, J. N. K. RAO, Graduate Research Center of the Southwest.
8. *An Interpretation of Negative and Other Unorthodox Probabilities*, J. H. HALTON, Brookhaven National Laboratory.

4:00 p.m., Place: Room 013—Council Meeting of the IASPS

5:00 p.m. —Sightseeing Tour of Berne

Wednesday, September 16, 1964

#### 9:30 a.m.—Invited Papers on Miscellaneous Topics

Chairman: D. DUGUÉ, University of Paris

1. *Problèmes d'estimation géométriques*, J. GEFFROY, University of Rouen.
2. *On the Empirical Bayes Method*, O. BARNDORFF-NIELSEN, University of Aarhus.
3. *L'analyse statistique des signaux émis par les radios-services de faible intensité*, G. LAUCHARD, University of Brussels.
4. *The Probability of Success of Certain Storage Schemes*, A. A. ANIS, Ministry of Treasury, Cairo.

General Meeting of IASPS Members.

#### 2:15 p.m.—Invited Papers on Applied Probability

Chairman: K. JACOBS, University of Göttingen

1. *Reliability Models for Complex Systems*, L. S. GEPHART, Air Force Logistics Command, Wright-Patterson AFB, Ohio.
2. *Life Testing and Reliability*, F. DOWNTON, University of Leicester.
3. *The Transformation of the Schrödinger Wave Equation into a System of Equations of Stochastic Processes which Have First and Second m.s. Derivatives*, K. KOSTÁL, Prague.
4. (Contributed Paper). *Sur des méthodes d'“extension” des carrés latins orthogonaux*, R. GUERIN.

5:30 p.m. Reception at Hotel Bellevue by representatives of the City Council and the Government of the Canton of Berne.

**Contributed Papers (By Title)**

1. *Some Renyi Type Limit Theorems for Empirical Distribution Functions*, M. CSÖRGÖ, Princeton University.
2. *Certain General Properties of Ordered Least Squares Estimates of Location and Scale Parameters*, Z. GOVINDARAJULU, Case Institute of Technology, Cleveland.
3. *A System of Inequalities for the Incomplete Gamma Function and the Normal Integral*, S. S. GUPTA and M. N. WAKNIS, Purdue University.
4. *Iterated Tests for the Equality of Mean Vectors from Multivariate Normal Populations (Preliminary Report)*, P. R. KRISHNAIAH, Aerospace Research Laboratories, Wright-Patterson AFB, Ohio.
5. *Distribution of the Studentized Smallest Chi-Square, with Tables and Applications*, P. R. KRISHNAIAH, and J. V. ARMITAGE, Aerospace Research Laboratories, Wright-Patterson AFB, Ohio.
6. *Rank Test for Scale Parameter for Asymmetrical One-Sided Distribution*, M. A. H. TAHA, Swiss Federal Institute of Technology, Zurich.

A. HALD  
Associate Secretary