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REPORT OF THE MINNEAPOLIS MEETING OF THE INSTITUTE

The thirteenth summer meeting and forty-eighth meeting of the Institute of Mathematical Statistics was held at the University of Minnesota, September 4–7, 1951, in conjunction with the summer meeting of the Mathematical Association of America, the summer meeting of the American Mathematical Society and the Minneapolis meeting of the Econometric Society. The meeting was attended by the following one hundred and six members of the Institute:

G. E. Albert, R. L. Anderson, T. W. Anderson, K. J. Arnold, W. D. Baten, Helen P. Beard, Agnes Berger, Joseph Berkson, Jean Bronfenbrenner, Irwin Bross, Hobart Bushey, Maria Castellani, Herman Chernoff, A. G. Clark, T. F. Cope, A. H. Copeland, Sr., L. M. Court, E. L. Cox, J. F. Daly, G. B. Dantzig, W. J. Dixon, J. L. Doob, Aryeh Dvoretzky, P. S. Dwyer, Churchill Eisenhart, Lillian Elveback, H. P. Evans, C. H. Fischer, Evelyn Fix, J. S. Frame, Robert Gage, H. M. Gehman, L. A. Goodman, John Gurland, P. C. Hammer, T. E. Harris, H. L. Harter, Clifford Hildreth, J. L. Hodges, Jr., Wassily Hoeffding, J. F. Hofmann, Robert Hogg, Harold Hotelling, H. M. Hughes, S. L. Isaacson, P. O. Johnson, Walbert Kalinowski, Leo Katz, Harriet J. Kelly, O. Kempthorne, M. G. Kendall, Jack Kiefer, W. M. Kincaid, T. C. Koopmans, C. F. Kossack, R. L. Kozelka, William Kruskal,

O. E. Lancaster, F. C. Leone, Howard Levene, S. B. Littauer, R. B. McHugh, H. B. Mann, Margaret P. Martin, K. O. May, G. F. T. Mayer, Paul Meier, M. R. Mickey, Sigeiti Moriguti, Frederick Mosteller, Jerzy Neyman, M. L. Norden, I. Olkin, Arthur Ollivier, Toby Oxtoby, M. P. Peisakoff, G. B. Price, J. A. Rafferty, Howard Raiffa, F. D. Rigby, D. D. Rippe, Herman Rubin, Henry Scheffé, Elizabeth L. Scott, W. B. Simpson, Andrew Sobczyk, Milton Sobel, M. D. Springer, Charles Stein, Joseph Talacko, W. F. Taylor, Henry Teicher, D. Teichroew, D. J. Thompson, L. J. Tick, G. Tintner, A. E. Treloar, A. W. Tucker, J. W. Tukey, S. A. Tyler, E. C. Varnum, John von Neumann, D. F. Votaw, J. S. White, J. Wolfowitz, and M. A. Woodbury.

The meeting opened on Tuesday morning, September 4, 1951, with a *Symposium on Medical Statistics*. Professor Alan Treloar of the University of Minnesota was chairman. Dr. Joseph Berkson of the Mayo Clinic presented a paper entitled *Estimate of Effectiveness of Cancer Therapy from Mortality following Treatment*. Professor Jerzy Neyman of the University of California presented a paper entitled *Further Results Concerning the Follow-up Procedure*. Prepared discussion of the papers was offered by Miss Lillian Elveback of the University of Minnesota, Dr. Evelyn Fix of the University of California and Dr. W. F. Taylor of the School of Aviation Medicine. Approximately 55 persons attended the session.

During the meeting the Institute joined the Econometric Society in three sessions devoted to a *Symposium on the Theory of Games, Decision Problems and Related Topics*. The first of these sessions with the title *Theory of Games* for the session was held on Tuesday afternoon under the chairmanship of Professor John von Neumann of the Institute for Advanced Study. Over 250 persons attended this session. Papers were presented by Professor Samuel Karlin of Princeton University and the Rand Corporation and by Dr. Olaf Helmer of the Rand Corporation. Prepared discussion was presented by Dr. Seymour Sherman of Lockheed Aircraft Corporation, Dr. L. S. Shapley of Princeton University and the Rand Corporation, Professor Howard Raiffa of the University of Michigan, and Dr. G. B. Dantzig of the Department of the Air Force.

On Wednesday morning the first of three sessions for contributed papers was held under the chairmanship of Professor W. J. Dixon of the University of Oregon. Attendance was approximately 50. The following papers were presented:

1. *On Stieltjes Integral Equations of Stochastic Processes*. Maria Castellani, University of Kansas City.
2. *An Unfavorable Aspect of the Likelihood Ratio Test*. L. M. Court, Rutgers University.
3. *Impartial Decision Rules and Sufficient Statistics*. R. R. Bahadur and L. A. Goodman, University of Chicago.
4. *Contributions to the Statistical Theory of Counter Data*. G. E. Albert, University of Tennessee and Oak Ridge National Laboratory, and M. L. Nelson, Oak Ridge National Laboratory.
5. *On the Use of Wald's Classification Statistic*. H. L. Harter, Michigan State College.

Later on Wednesday morning, Session II—*Statistical Decision Problems*—of the *Symposium on the Theory of Games, Decision Problems and Related Topics* was held with Professor A. W. Tucker of Princeton University as chairman. Approximately 175 persons attended. Papers were presented by Professor David

Blackwell of Howard University and Professor Charles Stein of the University of Chicago. Prepared discussion was presented by Dr. M. P. Peisakoff of the Rand Corporation, Professor Aryeh Dvoretsky of Hebrew University, Jerusalem, and Cornell University, Professor Herman Chernoff of the University of Illinois, Professor J. L. Hodges of the University of California, and Professor Samuel Karlin of Princeton University and the Rand Corporation.

On Thursday morning a *Symposium on Probability and Statistical Inference* was held jointly with the Econometric Society. Professor Leo Katz of Michigan State College was chairman. Approximately 140 persons attended. Professor Jerzy Neyman of the University of California presented a paper on *Inductive Behavior* and Professor J. W. Tukey of Princeton University presented a paper on *Purposes of Fiducial Inference*. Prepared discussion was presented by Professor Leonid Hurwicz of the University of Minnesota and Professor Gerhard Tintner of Iowa State College.

The Third Rietz Memorial Lecture was given by Professor Harold Hotelling of the University of North Carolina at 2 p.m. Thursday, September 6, 1951 under the title, *The Behavior of Standard Statistical Tests under Nonstandard Conditions*. Professor Jerzy Neyman of the University of California was chairman of the session. The attendance was approximately 120.

Later on Thursday afternoon, Session III—*Decision Making and Theory of Organization*—of the *Symposium on the Theory of Games, Decision Problems and Related Topics* was held with Professor T. C. Koopmans of the Cowles Commission as chairman. Approximately 100 persons attended. A paper by Professor Leonid Hurwicz of the University of Minnesota was followed by prepared discussion by Dr. Norman Dalkey of the Rand Corporation, Professor David Gale of Brown University, and Commander W. H. Keen of the Naval Air Development Center. A paper by Dr. M. M. Flood of the Rand Corporation was followed by prepared discussion by Professor C. B. Tompkins of George Washington University and Professor H. A. Simon of Carnegie Institute of Technology.

Early Friday morning the second session for contributed papers, attended by approximately 50 people, was held with Professor Henry Scheffé of Columbia University as chairman. The following papers were presented:

6. *Polynomial Determination in a Field of Integers Modulo P*. E. C. Varnum, Barber-Colman Company.

7. *About Some Symmetrical Distributions from the Perks' Family of Functions*. J. V. Talacko, Marquette University.

8. *A Large-Sample Test for the Variation of Sample Covariance Matrices*. D. D. Rippe, University of Michigan.

9. *Probability Models for Analyzing Time Changes in Attitudes*. T. W. Anderson, Columbia University.

10. *The Variance of a Weighted Average Using Estimated Weights*. Paul Meier, Princeton University.

An *Abraham Wald Memorial Session* was held at 10:30 a.m. Friday, September 7, 1951. Professor Harold Hotelling of the University of North Carolina

was chairman. Approximately 100 people attended the session. A paper on *Wald's Contributions in Pure Mathematics* by Professor Karl Menger of Illinois Institute of Technology was read by Professor J. L. Kelley of Tulane University. A paper on *Wald's Contributions in Econometrics* was presented by Professor Gerhard Tintner of Iowa State College and a paper on *Wald's Contributions in Mathematical Statistics* was presented by Professor J. Wolfowitz of Cornell University.

Early Friday afternoon a session under the chairmanship of Professor Paul S. Dwyer of the University of Michigan was devoted to two invited addresses. Approximately 70 persons attended. Dr. T. E. Harris of the Rand Corporation spoke on *First Passage and Recurrence Distributions* and Professor M. G. Kendall of the London School of Economics spoke *On the Systematic Determination of Sampling Distributions.*

Later on Friday afternoon the third session for contributed papers was held under the chairmanship of Professor K. J. Arnold of the University of Wisconsin. Approximately 40 persons attended. The following papers were presented:

11. *Distribution of Ratios of Quadratic Forms.* John Gurland, University of Chicago.

12. *The Large-Sample Power of Tests Based on Permutations of Observations. Preliminary Report.* Wassily Hoeffding, University of North Carolina.

13. *A Complete Class of Decision Procedures for Distributions with Monotone Likelihood Ratio.* Herman Rubin, Stanford University.

The following papers were presented by title at the meeting:

14. *Some Nonparametric Results for Experimental Designs.* J. E. Walsh, Bureau of the Census.

15. *Efficient Tests and Confidence Intervals for Mortality Rates.* J. E. Walsh, Bureau of the Census.

16. *Sufficient Statistics when the Carrier of the Distribution Depends on the Parameter.* D. A. S. Fraser, University of Toronto.

17. *Bayes Solutions and Likelihood Ratio Tests of Some Simple and Composite Hypotheses. Preliminary Report.* Allan Birnbaum, Columbia University.

18. *The Impossibility of Certain Affine Resolvable Balanced Incomplete Block Designs.* S. S. Shrikhande, Nagpur College of Science, India.

19. *On Sufficiency and Statistical Decision Functions.* R. R. Bahadur, University of Chicago and Delhi University, India.

20. *A Two Sample Test Procedure.* D. B. Owen, University of Washington.

21. *A Combinatorial Central Limit Theorem.* Wassily Hoeffding, University of North Carolina.

22. *Necessary Conditions for the Existence of a Symmetrical Group Divisible Design.* R. C. Bose and W. S. Connor, Jr., University of North Carolina.

23. *On a Problem of Mapping of One Space on Another with Applications in Sampling Distributions.* S. N. Roy, University of North Carolina.

24. *On a Theorem in Jacobians with Statistical Applications.* S. N. Roy, University of North Carolina.

25. *The Inventory Problem.* A. Dvoretzky, J. Kiefer and J. Wolfowitz, Cornell University.

The Council of the Institute held a meeting at 1:30 p.m. on Wednesday, September 5, 1951.

A business meeting of the Institute was held at 9 a.m. on Thursday, September 6, 1951.

Social events included a reception sponsored by the mathematical organizations and the College of St. Thomas on Tuesday evening, a banquet on Wednesday evening, a piano recital on Thursday evening and a beer party sponsored by the Institute later on Thursday evening.

K. J. ARNOLD
Associate Secretary

PUBLICATIONS RECEIVED

Anuario Estadistico de España, (Instituto Nacional de Estadistica), Presidencia del Gobierno, Madrid, 1950, xliii + 1048 pp.

Anuario Estadistica de España (Edicion Manual), (Instituto Nacional de Estadistica), Presidencia del Gobierno, Madrid, 1951, lvii + 944 pp.

WALKER, HELEN M., *Mathematics Essential for Elementary Statistics*, rev. ed., Henry Holt and Company, New York, 1951, viii + 382 pp., $2.75.