where F_i's are the roots of the equation in $F: |a_{1ij} - Fa_{2ij}| = 0$, such that the largest root has moderate optimum properties with respect to one class of alternatives, the smallest for another class and the product of the roots (which is the likelihood ratio test) for another class of alternatives—all discussed in this paper. (2) With k random samples of sizes n_r from k p-variate normal populations with means m_{ri} and a common dispersion matrix (α_{ij}), $r = 1, 2, \cdots, k$; $i, j = 1, 2, \cdots, p$, an infinite number of similar region tests could be constructed for the composite hypothesis $(m_{1i}) = (m_{2i}) = \cdots = (m_{ki})$, $i = 1, 2, \cdots, p$, among which there is none having the strong optimum properties of the F-test in the analogous univariate problem. Among these similar region tests, however, there is a subset based on $\mathbf{F}_i$, $i = 1, 2, \cdots, q \leqq p$, where F_i's are the nontrivial roots of the equations in F: $|b_{1ij} - Fb_{2ij}| = 0$ (where (b_{1ij}) is the matrix of the sample means reduced to the grand means and (b_{2ij}) is the pooled dispersion matrix from the different samples), such that the largest and smallest roots have moderate optimum properties with respect to two different classes of alternatives and the sum of the roots for a third class of alternatives—all discussed in this paper. The likelihood ratio test, however, leads to the product. The wide variety of situations each problem could be made to cover is also discussed in this paper.

NEWS AND NOTICES

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

Personal Items

Dr. K. S. Banerjee, Statistician at the Central Sugarcane Research Station, Bihar, India, received his doctorate degree from the Calcutta University in January of this year. His thesis covered his contributions to "weighing designs."

Mr. Lyle D. Calvin, formerly at the Institute of Statistics, North Carolina State College, has accepted the position of Biometrician with the Division of Biological Research, G. D. Searle & Co., Chicago, Illinois.

Dr. Robert J. Hader has accepted a position on the staff of the Institute of Statistics, North Carolina State College. He leaves Los Alamos, New Mexico, where he has been employed as statistician for the Los Alamos Scientific Laboratory for the past two years.

Mr. Bernard Hecht has joined the Victor Division of RCA, Camden, New Jersey, as Manager, Assembly Quality Control, after five years as Quality Control Manager of the International Resistance Company of Philadelphia, Pennsylvania.

Dr. Edward L. Kaplan has received his doctorate degree in mathematics from Princeton University and is now a member of the Technical Staff, Bell Telephone Laboratories, Murray Hill, New Jersey.

Dr. Eugene Lukacs has joined the staff of the Statistical Engineering Laboratory of the National Bureau of Standards. At the Bureau he will be engaged in research in mathematical statistics, particularly autoregressive series and stochastic processes.

Mr. A. W. Marshall, formerly at the Washington, D. C., office of the Rand Corporation, has now moved to its Santa Monica, California, office.

Dr. J. E. Morton is on leave of absence from Cornell University and is serving as Chief, Statistical Research and Development Staff, Office of the Housing Administrator, Washington, D. C.

Dr. J. Ernest Wilkins, Jr., formerly on the staff at the American Optical Company, is now with Nuclear Development Associates, Inc., 80 Grand Street, White Plains, New York.

Dr. William J. Youden of the National Bureau of Standards has recently been elected to Fellowship in the New York Academy of Sciences.

Sigeiti Moriguti, Assistant Professor of Applied Mathematics at the University of Tokyo, is spending the academic year 1950–51 in research and study of mathematical statistics at the University of North Carolina under the sponsorship of the United States Army. He is the author of numerous research articles and a book on the theory of statistics.

Statistics at Chicago

The University of Chicago in 1949 established a Committee on Statistics which is in all respects equivalent to a department, having its own faculty, budget, and curriculum. Its purposes are research, instruction, and consultation. Its faculty includes R. R. Bahadur, Milton Friedman, Leo A. Goodman, John Gurland, Tjalling C. Koopmans, William H. Kruskal, Harry V. Roberts, Murray Rosenblatt, Leonard J. Savage, Charles M. Stein, and W. Allen Wallis (Chairman). Among other statisticians at the University of Chicago are Walter Bartky (Physical Sciences), Donald W. Fiske (Psychology), Philip M. Hauser (Sociology), Paul R. Halmos (Mathematics), Karl J. Holzinger (Education), H. Gregg Lewis (Economics), Jacob Marschak (Cowles Commission for Research in Econometrics), William Stephenson (Psychology), Louis L. Thurstone (Psychology), Josephine Williams (National Opinion Research Center), and Sewall Wright (Zoology).

The following courses are offered by the Committee: Introduction to Statistics; Statistical Inference (3 quarters); Introduction to Mathematical Probability; Introduction to Mathematical Statistics (2 quarters); Sample Surveys; Analysis of Variance and Regression; Estimation and Tests of Hypotheses; Statistical Theory of Decision-making; Theory of Minimum Risk; Sequential Analysis; Non-parametric Inference; Multivariate Analysis; Design of Experiments; Time Series; Statistical Problems of Model Construction; Limit Theorems of Probability Theory; Markov Processes; Mathematical Techniques of Statistics; and several seminars. In addition, a number of statistics courses are offered in other departments, e.g., Factor Analysis, Econometrics, Quality Control, Index Numbers, Biometrics, etc.

Three kinds of degree may be obtained at Chicago in Statistics. (1) *The M.A. or Ph.D. in a substantive field, with concentration in Statistics*, is not administered by the Committee, but it cooperates fully with the substantive departments in these degree programs. (2) *The M.A. in Statistics* is awarded on the basis of

(i) a thesis, (ii) written examinations, and (iii) work in a minor field. (3) *The Ph.D. in Statistics* is awarded on the basis of (i) preliminary written examinations, (ii) work in a minor field, (iii) participation in statistical consultation, (iv) a dissertation, (v) a public lecture on the content of the dissertation, and (vi) a final oral examination.

Summer Sessions in Berkeley, California

This year's summer program at the Statistical Laboratory of the University of California, Berkeley, California, consists of two sessions, June 18–July 28 and July 30–September 8. The program includes four of the usual undergraduate courses, two in each session, and two graduate courses. One of the latter is a regular course of lectures on rank correlation methods and on time series analysis. The other graduate course is a seminar on time series and related problems. Both graduate courses will be given during the first summer session by Professor Maurice G. Kendall of the London School of Economics and Political Science. Professor J. Neyman will be available for consultations on work leading to higher degrees. In addition to the above two persons, the faculty of the summer sessions will include Dr. Grace E. Bates (Mount Holyoke College), Dr. Colin R. Blyth (University of Illinois), and Dr. Gottfried E. Noether (New York University).

Summer Seminar in Statistics

The second annual session of the Summer Seminar in Statistics will be held at the University of Connecticut, Storrs, Connecticut, August 6–31, 1951. The purpose of the Seminar is to stimulate general exchange of ideas by providing informal contacts and free discussions among academic statisticians, students, and users of statistical techniques. The principal session meets daily from 3:00 p.m. to supper. The schedule of topics, together with the organizers of each week's program, is as follows:

August 6–10. Statistics in the Biological Sciences (C. I. Bliss and J. Ipsen);
August 13–17. Time Series (M. G. Kendall and J. W. Tukey);
August 20–24. Statistical Theory and Probability (M. Kac and H. Robbins);
August 27–31. Statistical Techniques with Special Reference to the Social Sciences (F. C. Mosteller, F. L. Strodtbeck, and M. A. Woodbury).

Frequent statistical clinics to discuss the solution of particular practical problems are planned.

Dormitory accommodations of single and double rooms are available at the University of Connecticut. Family groups of three or more must use other housing. It is hoped that a number of stipends to cover living expenses will be available on a competition basis to graduate students. Further information about the Seminar may be obtained from the Secretary of the Seminar: Professor D. F. Votaw, Jr., Department of Mathematics, Yale University, New Haven, Connecticut.

Doctoral Dissertations in Statistics, 1950

Listed below are the doctorates conferred during the year 1950 in the United States and Canada for which the dissertations were written on topics in statistics. The university, month in which degree was conferred, major subject, minor subject, and the title of the dissertation are given in each case if available. If any doctorate properly belonging in this list is omitted, the Editor would like the relevant information concerning such doctorate. It is planned to publish a list of doctorates in the June issue each year.

R. R. Bahadur, North Carolina, June, major in mathematical statistics, minor in experimental statistics and mathematics, "On a Class of Decision Problems in the Theory of R Populations."

C. R. Blyth, California, June, major in mathematics, "I. Contribution to the Statistical Theory of the Geiger-Müller Counter. II. On Minimax Statistical Decision Procedures and Their Admissibility."

K. A. Bush, North Carolina, August, major in mathematical statistics, minor in mathematics and economics, "Orthogonal Arrays."

A. L. Finkner, North Carolina, major in experimental statistics, minor in agronomy, "Further Investigation on the Theory and Application of Sampling for Scarcity Items."

W. D. Foster, North Carolina, major in experimental statistics, minor in meteorology, "On the Selection of Predictors: Two Approaches."

M. Halperin, North Carolina, August, major in mathematical statistics, minor in experimental statistics and mathematics, "Estimation in Truncated Sampling Processes."

H. M. Hughes, California, September, major in mathematics, "Estimation of the Variance of the Bivariate Normal Distribution."

P. E. Irick, Purdue, February, major in mathematics, minor in psychology, "A Geometric Study of the Exact Sampling Distribution of Standard Deviations When the Sampled Population Is Arbitrary."

S. L. Isaacson, Columbia, June, major in mathematical statistics, minor in mathematics, "On the Theory of Unbiased Tests of Simple Statistical Hypotheses Specifying the Values of Two or More Parameters."

E. H. Jebe, North Carolina, major in experimental statistics, minor in agricultural economics, "The Theory and Application of the Selection of Primary Units for Sampling an Agricultural Population."

A. W. Kimball, Jr., North Carolina, major in experimental statistics, minor in mathematics, "Studies in the Statistical Design and Analysis of Microbiological Assays of Amino Acids."

G. E. McCreary, Iowa State College, June, major in statistics, minor in mathematics and economics, "Cost Functions for Sample Surveys."

L. E. Moses, Stanford, major in statistics, minor in mathematics, "An Iterative Construction of the Optimum Sequential Procedure When the Cost Function Is Linear."

S. W. Nash, California, June, major in mathematics, "I. Contribution to the

Theory of Experiments with Many Treatments. II. On the Law of the Iterated Logarithm for Dependent Random Variables."

R. P. Peterson, California (Los Angeles), June, major in mathematics, "Certain Optimum Statistical Decision Methods."

M. Pizzi (Doctor of Public Health), Johns Hopkins, "An Approximate Solution for the Standard Error of LD50 as Obtained by the Reed-Muench Method."

B. Sherman, Princeton, June, major in mathematics, "A Random Variable Related to the Spacing of Sample Values."

S. S. Shrikhande, North Carolina, August, major in mathematical statistics, minor in experimental statistics, "Construction of Partially Balanced Designs and Related Problems."

H. Solomon, Stanford, major in statistics, "Distribution of the Measure of a Two-Dimensional Random Set."

H. E. Teicher, Columbia, June, major in mathematical statistics, minor in mathematics, "On the Factorization of Distributions."

W. A. Vezeau, St. Louis, June, major in mathematics, "On the Product Distribution of Normally Distributed Variables."

S. A. Vora, North Carolina, June, major in mathematical statistics, minor in experimental statistics, "Bounds on the Distribution of Chi-Square."

J. T. Wakeley, North Carolina, major in experimental statistics, minor in meteorology, "On Linear Regression Method as Related to Long Time Experiments in Agricultural Climatology."

New Members

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

(December 1, 1950 to February 28, 1951)

Benktander, Gunnar, Fil. Kand. (Univ. of Stockholm), Actuary, Post Fack, Stockholm 26, Sweden.

Boll, C. H., B.S. (Stanford Univ.), Graduate student in Statistics, Stanford University, *1247 Cowper, Palo Alto, California.*

Carey, T. M., Ph.D. (Univ. of London), Lecturer in Mathematics, University College, Cork, Ireland, *"Duinin," Laburnum Park, Model Farm Road, Cork, Ireland.*

DeLancie, R. H., A.B. (Univ. of Calif.), Graduate student in Statistics, University of California, *1137 Colusa Avenue, Berkeley 7, California.*

Dighero, Oscar Alfonso Martinez, Graduate (Univ. of San Carlos, Guatemala), Civil Engineer, Chief, Division of Engineering and Architecture, Instituto Gautemalteco de Seguridad Social, *11 Avenida Norte No. 44, Guatemala, Guatemala, Central America.*

Ellery, J. B., M.A. (Univ. of Colo.), Graduate student and Teaching Assistant, Department of Speech, University of Wisconsin, *7 Tilton Terrace, Madison 4, Wisconsin.*

Esary, J. D., A.B. (Whitman College), Teaching Assistant, Statistical Laboratory, University of California, *2534 Dwight Way, Berkeley 4, California.*

Esscher, Fredrik, Ph.D. (Univ. of Lund), Chief Actuary, Skandia Insurance Co., Stockholm 2, Sweden.

Grometstein, A. A., M.A. (Columbia Univ.), Industrial Statistician and Consulting Physicist, Sylvania Electric Products, Inc., 70 Forsyth Street, Boston, Massachusetts.

Gross, F. A., B.S. (American Univ.), Statistician, Research Division, Bureau of Naval Personnel, Arlington, Virginia, *3409B New Mexico Ave., N. W., Washington 16, D. C.*

Houthakker, H. S., Ph.D. (Univ. of Amsterdam), Research Officer, University of Cambridge, Department of Applied Economics, *8 Richmond Road, Cambridge, England.*

Hubbell, C. H., A.B. (Oberlin College), Box 467, Benjamin Franklin Station, Washington 4, D. C.

Kurtz, T. E., A.B. (Knox College), Research Assistant, Mathematics Department, Fine Hall, Box 708, Princeton University, Princeton, New Jersey.

Lanteli, Gunnar, Fil. Kand. (Univ. of Lund), Actuary of Försäkringsaktiebolaget Hansa, Stockholm 7, Sweden.

Matern, Bertil, Fil. Lic. (Univ. of Stockholm), Assistant Professor, Swedish Forest Research Institute, *Lappkarrsvagen 47, Stockholm 50, Sweden.*

McCall, Jr., C. H., A.B. (George Washington Univ.), Assistant in Statistics, *6701-44th Street, Chevy Chase 15, Maryland.*

McHugh, R. B., M.A. (Univ. of Minn.), Assistant Professor of Psychology and Statistics, Iowa State College, *222 Stanton, Ames, Iowa.*

Meier, Paul, M.A. (Princeton Univ.), Statistician, and Research Secretary, Philadelphia Tuberculosis and Health Association, *39 Vandeventer Avenue, Princeton, New Jersey.*

Owen, D. B., M.S. (Univ. of Wash.), Research Associate in Mathematics, University of Washington, *612 West 85th Street, Seattle 7, Washington.*

Poch, F. A., Licenciado en Ciencias (Univ. of Madrid), Official, Instituto Nacional de Estadistica; Specialist of Section of Methodology; Assistant Professor, Mathematical Statistics, University of Madrid, Madrid, Spain.

Rios, Sixto, Ph.D., Professor of Mathematical Statistics, University of Madrid; Chief, Department of Statistics of the Superior Council of Scientific Research, Madrid, Spain.

Rosenbaum, S. Z., B.S. (Univ. of Chicago), Research Director, Community Welfare Council of Milwaukee County, 2965 N. 81st Street, Milwaukee 10, Wisconsin.

Saxen, Tryggwe, B.Sc. (Univ. of Helsingfors), Fil. Kand., Assistant Actuary of Industrial Accident Insurance Co., *Kasarngatan 44V, Helsingfors, Finland.*

Shapiro, Arthur, A.B. (Brooklyn College), 6633½ Telegraph Avenue, Oakland 9, California.

Shimizy, Kunio, B.A. (Univ. of British Columbia), Statistician, Institutions Section, Dominion Bureau of Statistics, Ottawa, Ontario, Canada.

Soda, Takemune, M.P.H. (Johns Hokpins Univ.), Chief, Division of Health and Welfare Statistics, Ministry of Welfare, Tokyo; Chief, Department of Epidemiology, Institute of Public Health, Tokyo, *808 Den'en-Chofu 2-Chome, Ohta-ku, Tokyo, Japan.*

Strodtbeck, F. L., Ph.D. (Harvard Univ.), Assistant Professor of Sociology, Yale University, *576 Whalley Avenue, New Haven 11, Connecticut.*

Taranger, Aksel, B.Sc. (Univ. of Wis.), General Sales Manager, Norsk Aluminium Company, Loekkeveien 9, Oslo, Norway.

van Dantzig, D., Ph.D. (Groningen, Netherlands), Head of Department of Statistics, Mathematical Centre, Amsterdam; Professor, University of Amsterdam, *Valeriusstraat 58, Amsterdam-Zuid, Netherlands.*

Varnum, E. C., M.S. (Univ. of Mich.), Mathematician, Barber-Colman Company, Rockford, Illinois.

REPORT OF THE OAK RIDGE MEETING OF THE INSTITUTE

The forty-sixth meeting of the Institute of Mathematical Statistics was held jointly with the Biometric Society (Eastern North American Region) at the