obtain an estimate of the population mean, an estimate of the standard deviation of this estimate of the mean, and an estimate of the population standard deviation. This paper derives a nonparametric estimate for each of these three cases. These estimates are approximately valid for most continuous statistical populations of practical interest when a small number of sample values are truncated and the sample size is not too small. The mean estimate consists of a linear function of the ordered values of the truncated sample, while each standard deviation estimate is the square root of a quadratic function of these observations. (Received April 10, 1957.)

7. Distinguishability of Sets of Distributions (The Case of Independent and Identically Distributed Chance Variables.), W. Hoeffding, University of North Carolina, and J. Wolfowitz, Cornell University.

Let $\mathfrak{I}$ be a class of tests, based on a sequence of independent chance variables with the common distribution F (assumed to belong to a set $\mathfrak{F}$ of distributions), for testing whether F belongs to one of two disjoint subsets, $\mathcal{G}$ and $\mathcal{H}$, of $\mathfrak{F}$. We consider the cases where $\mathfrak{I}$ is either the class of all tests which terminate with probability one if $F \varepsilon \mathfrak{F}$, or the class of all fixed sample size tests, or one of several classes intermediate between these two. The sets $\mathcal{G}$ and $\mathcal{H}$ are said to be distinguishable in $\mathfrak{I}$ if, for every $\epsilon > 0$, there exists a test in $\mathfrak{I}$ such that the error probability is $< \epsilon$ for all $F \varepsilon \mathcal{G} \cup \mathcal{H}$. It is shown that if there exists a test in $\mathfrak{I}$ such that the sum of the maximum error probability in $\mathcal{G}$ and the maximum error probability in $\mathcal{H}$ is less than 1, then $\mathcal{G}$ and $\mathcal{H}$ are distinguishable in $\mathfrak{I}$. Sufficient conditions and necessary conditions for the distinguishability of two sets are expressed in terms of certain distance functions. Certain simple necessary conditions for distinguishability are found to be also sufficient if the class of distributions is suitably restricted. (Received May 20, 1957.)

8. An Extension of Box's Results on the Use of the F Distribution in Multivariate Analysis, Seymour Geisser and Samuel W. Greenhouse, National Institute of Mental Health.

The mixed model in a 2-way analysis of variance is characterized by fixed classification, e.g. treatments, and a random classification, e.g. plots. Under the usual analysis of variance assumptions the proper error for the fixed effect is the fixed $\times$ random interaction component, and the resulting ratio has the F-distribution. If we have individuals instead of plots as the random component and the treatments are correlated, then Box has shown that one may still use the same F-ratio as before as a test of treatment effects; however, the F-ratio does not have the requisite F-distribution, but it can be shown that it is distributed approximately like an F-distribution but with modified degrees of freedom. Box did this for one group of individuals; the authors have extended the Box technique to g groups of individuals and give the modified F-distribution for the tests of treatment effects and treatment $\times$ group interaction effects. (Received May 24, 1957.)

NEWS AND NOTICES

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

Personal Items

H. R. Bright, formerly Deputy Director of the Human Resources Research Office, George Washington University, is now employed as Specialist, Operations

Research and Synthesis, of the Circuit Protective Devices Department, General Electric Company, Plainville, Conn.

The appointments of Dr. Samuel H. Brooks and Julian T. Anderson to the Scientific Staff of Technical Operations, Incorporated, were announced today by Floyd I. Hill, Associate Director of the research and development firm's West Coast office.

Loudon Campbell is now with the Advertising Department of Eaton Laboratories, Norwich, New York.

Z. T. Chang, who has recently come to the United States, has joined Osborne and Thurlow, 39 Broadway, New York City.

Alan Constantine has joined a theoretical research group at the University of Adelaide, Adelaide, Sth. Australia.

Norman R. Garner has resigned as Consulting Statistician to the Quality Control Department of the Naval Powder Factory, Indian Head, Maryland and has joined the Reliability Control Staff of the Aerojet-General Corporation, Azusa, California.

Mark L. Hinkle, Jr. is presently with Western Electric Company as a Development Engineer at the Hawthorne Works in the Department for Mechanization of Equipment Engineering.

B. S. Kawar has been employed by Remington Rand Univac in St. Paul, Minn. to work with the group on "Programming Research and Development".

Truman L. Kochler, Jr. has left the employ of Sylvania Electric Products to accept a position as an experimental statistician with the Operational Statistics Group of the American Cyanamid Corporation.

Dr. R. G. Laha of the Indian Statistical Institute (Calcutta) has been appointed to the position of a Research Associate in the Mathematics Department of The Catholic University of America. He will do research in probability theory and mathematical statistics.

Dr. Eugene Lukas of the Mathematics Department of the Catholic University of America has been granted a leave in order to permit him to accept an invitation to give several lectures at the Sorbonne (Paris).

Jacob Marschak is Professor of Economics and Research Associate of the Cowles Foundation for Research in Economics, Yale University. He is conducting a project, under a contract with the Office of Naval Research, on Decision-Making under Uncertainty.

Michael A. Martino, Jr. has accepted a position as mathematician at the Knolls Atomic Power Laboratory of the General Electric Company in Schenectady, New York.

Albert Mindlin has been appointed Technical Assistant to the Chief of the Statistics Branch, Bureau of Old Age and Survivors Insurance, U. S. Department of Health, Education, and Welfare.

Sidney I. Neuwirth has assumed the position of Operations Research Consultant at Johnson and Johnson, New Brunswick.

Romuald Slimak has recently been appointed Adjunct Assistant Professor of

Mathematics at the School of Engineering, New York University to teach computer methodology.

Lt. (j.g.) F. Beckley Smith, Jr. is now serving on active duty in the U. S. Navy, stationed in Washington, D. C.

Dr. M. D. Springer of the Naval Ordnance Plant, Indianapolis, has accepted a position as Senior Operations Analyst with Technical Operations, Inc., Fort Monroe, Virginia.

David S. Stoller is now a member of the Technical Staff, Computer Systems Division of the Ramo-Wooldridge Corporation, Los Angeles.

Dr. David E. Van Tijn has accepted a position on the staff of Arthur D. Little, Inc.

Irving Weiss has left the Mathematics Department of Lehigh University to join the Bell Telephone Laboratories, North Andover, Massachusetts.

New Members

The following persons have been elected to membership in the Institute

February 6, 1957 to May 2, 1957

Anderson, Norman H., Ph.D. (Univ. of Wisconsin), Postdoctoral Fellow, Social Science Research Council, *Yale Univ. Department of Psychology, 333 Cedar St., New Haven, Conn.*

Askovitz, S. I., M.D. (Univ. of Penna.), Medical Statistician, Albert Einstein Medical Center, York and Tabor Roads, Phila. 41, Pa.; Chief of Tumor Registry, School of Medicine, Univ. of Penna., Philadelphia 4, Pa.; *4900 North 9th Street, Phila. 41, Pa.*

Belson, Irving, M.A. (Columbia Univ.), Statistician, *Mine Safety Appliances Research Corp., Callery, Pennsylvania.*

Bentley, D. L., B.S. (Stanford Univ.), Student, *Dept. of Statistics, Stanford Univ., Box 2695, Stanford, California.*

Borden, Julien Louis, B.A. (U.C.L.A.), Grad. Student, Research Assistant, U.C.L.A., Los Angeles, California; *6626 W. 5th St., Los Angeles 48, California.*

Brock, Dan A., M.A. (Southern Methodist University), Analyst and Statistician, Dallas City Water Works, City of Dallas, Texas; *2015 Commerce Street, Dallas, Texas.*

Cohen, Arthur, B.A. (Brooklyn College), Student, Dept. of Math., Columbia Univ., New York City, New York; *1925-66th St., Brooklyn 4, New York.*

Doornbos, R., M.S. (Univ. of Groningen), Statistician, Uhilever N.V., Unsemnpark 1, Rotterdam, Netherlands; *Lever's Zeep Mij, N.V., Parallelweg, Vlaardingen, Netherlands.*

Dorff, M. R., M.S. (Carnegie Inst. of Tech.), Student, Statistical Laboratory, Iowa State College, Ames, Iowa; *128 Lynn Ave., Ames, Iowa.*

Fedick, John, M.S. (Univ. of Michigan), Assistant to Treasurer, *Vickers, Inc. Administrative and Engineering Center, P.O. Box 302, Detroit 32, Michigan.*

Galligan, Agnes M., A.B. (Brown Univ.), Analytical Statistician, Quartermaster Research and Development Command, EPRD, Natuk, Mass.; *104 Lanoseer St., West Roxbury, Mass.*

Gnanadesikan, Ramanathan, Ph.D. (Univ. of N. C.), Research Assistant, Univ. of North Carolina, Dept. of Statistics, Chapel Hill, N. C.; *714 E. Franklin St., Chapel Hill, N. C.*

Hans, Otto, Candidate of Physical and Mathematical Sciences (Charles University), Scientific Worker, Czechoslovak Academy of Sciences, Institute of Radio-Engineering and

Electronics, Charles Street 2, Prague 1, Czechoslovakia; *until June 31, 1957, Krusinova 44, Praha 14, Czechoslovakia; from July 1, 1957, Dvorecka 3, Praha 15, Czechoslovakia.*

Horner, Theodore W., Ph.D. (N. C. State College), Asst. Prof., *Statistical Lab., Iowa State College, Ames, Iowa.*

Jensen, Arne, Ph.D. (Univ. of Copenhagen), Actuary, Copenhagen Telephone Co.; *Kvaedevej 74, Virum, Denmark.*

Johnson, Eugene A., Ph.D. (Univ. of Minn.), Asst. Prof. of Biostatistics, *School of Public Health, Univ. of Minnesota, Minneapolis 14, Minn.*

Kao, Richard C., Ph.D. (Univ. of Illinois), Asso. Mathematician, *the RAND Corp., Santa Monica, Calif.*

Krane, Scott A., B.A. (Simpson College), Grad. Student, Stat. Laboratory, *Iowa State College, Dept. of Statistics, Ames, Iowa.*

Lilliefors, Hubert W., M.A. (Michigan State Univ.), Mathematician, Operations Evaluation Group, MIT, P.O. Box 2176, Potomac Station, Alexandria, Virginia; *4411 N. Pershing Drive, Arlington, Virginia.*

Makable, Hajime, B.S., M.A. (Tokyo Inst. of Tech.), *Instructor of Math., Tokyo College of Science, Kagurazaka, Shinjuku-ku, Tokyo, Japan.*

Malik, Azizul, M.A. (Math., Muslin Univ., Aligazh), M.A. (Economics, Agra Univ.), Research Officer and Honorary Lecturer in Mathematical Statistics, Karachi Univ., *Central Statistical Office,* Ministry of Economic Affairs, *Muhammadi House (7th Floor), McLeod Road, Karachi.*

Martino, M. A., Jr., Ph.D. (Univ. of Illinois), Mathematical Analyst, National Security Agency, Washington 25, D. C.; *1412 Patrick Henry Drive, Falls Church, Va.*

Munoz-Febar, Luis E. Marquez, Licenciado en Ciencias Estadisticas (Universidad Central), Assor Tecnico Seccion Estadisticas, Direccion General de Estadistica, Torre Sur. Centro Simon Bolivar, Ministerio de Fomento-Direccion General de Estadistica, Seccion Est. Econ. 5° Piso; *Domicilio Particular, Arismendi a Pichineha 114, San Agustin del Norte, Caracas, Venezuela.*

McCullough, R. S., B.A. (Toronto), Teaching Fellow, Dept. of Math., Univ. of Toronto, Toronto, Ontario; *131 Heath St., East, Toronto, Ontario, Canada.*

Ozanne, Paul, B.S. (Univ. of Wisconsin), Asst. to Director of Planning, *Anheuser Busch, 721 Pestalozzi St., St. Louis 18, Mo.*

Panizzon, G., Ph.D., *Istituto di Statistics, Universita di Padova, Padova, Italy.*

Park, Han Shick, B.S. (College of Educ., Seoul National Univ.), Lecturer, *College of Education, Seoul National University, Dept. of Mathematics, Yongtoo-Dong, Seoul, Korea.*

Parmenter, Ellis F., Ph.D. (Brown Univ.), Sr. Research Engineer, *Statistical Consultant, Champion Paper and Fibre Co., Hamilton, Ohio.*

Sammons, William H., M.S. (Univ. of Kentucky), Dept. of Agriculture, Soil Conservation Service, Central Technical Unit, SCS, Hillculture Bldg., Agricultural Research Center, Beltsville, Maryland; *8714-63rd Ave., Berwyn Heights, Maryland.*

Smith, James D., M.S. (Univ. of Minnesota), Applied Science Representative, IBM, 590 Madison Ave., New York, N. Y.; *1200 Ind Ave., So., Minneapolis, Minn.*

Uzawa, Hirofumi, B.S. (Univ. of Tokyo), Research Associate, *Applied Mathematics and Statistics Laboratory, Stanford University, Stanford, California.*

Wall, Francis J., M.S. (Univ. of Colorado), Mathematician, Remington Rand Div. of Sperry-Rand Corp., *610 East 77th Street, Richfield 23, Minnesota.*

Walsh, Richard R., B.S. (Stanford Univ.), Student, Stanford University, Stanford, California, *1990 Avy Ave., Menlo Park, Calif.*

Wicks, Byron E., A.B. (Univ. of California), Operations Research Assistant, Bank of America, San Francisco, Calif.; *2381 Maricopa Ave., Richmond, Calif.*

Woodson, G. Stanley, M.A. (Univ. of Denver), Chief, Biostatistics Section, Medical Research Directorate, Chemical Corps, U. S. Army Chemical Center, Maryland; *111 South Reed Street, Bel Air, Maryland.*

AUSTRALIAN MATHEMATICAL SOCIETY

During 1956 at a meeting in Melbourne 121 pure and applied mathematicians formed the Australian Mathematical Society. About a fourth of these are professional statisticians and the 1956 meeting featured a number of statistics sessions. The Council consists of T. M. Cherry (President), C. S. Davis (Treasurer), T. G. Room (Public. Secr.), A. L. Blakers, H. S. Green, H. O. Lancaster, H. C. Levey, P. A. Moran, E. J. G. Pitman, A. H. Pollard, L. C. Woods. The General Secretary is J. P. Ryan (Math. Dept., Univ. of Melbourne, Carlton N. 3, Victoria, Australia). The next meeting will be held in Sydney on 28–31 August 1957·

PUBLICATIONS RECEIVED

COWDEN, D. J., *Statistical Methods in Quality Control*, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1957, xxiv + 727 pp., $9.00.

DIXON, W. J., and F. J. MASSEY, JR., *Introduction to Statistical Analysis*, McGraw-Hill Book Company, Inc., New York, 1957, xiii + 488 pp., $6.00.

OWEN, D. B., *The Bivariate Normal Probability Distribution*, Office of Technical Services, Department of Commerce, Washington, D. C., 1957, 136 pp., $.65.

RESNIKOFF, G. J. and G. J. LIEBERMAN, *Tables of the Non-Central t-Distribution*, Stanford University Press, Stanford, California, 1957, 389 pp., $12.50.