ABSTRACTS OF PAPERS

(Presented at the Berkeley Meeting of the Institute, June 16–18, 1949)

1. **Extension of a Theorem of Blackwell.** E. W. BARANKIN, University of California, Berkeley.

It is proved that Blackwell's method of uniformly improving the variance of an unbiased estimate by taking the conditional expectation with respect to a sufficient statistic, is, in fact, similarly effective on every absolute central moment of order $s \geqq 1$. The method leads to finer detail concerning the relationship between an estimate and its thus derived one. (This paper was prepared with the partial support of the Office of Naval Research.)

2. **On the Existence of Consistent Tests.** AGNES BERGER, Columbia University., New York.

Let $\mathfrak{M}(\mathfrak{B})$ denote the space of all probability-measures defined over a common Borel-field $\mathfrak{B}$. Let $\{m\} = M$, $\{m'\} = M'$ be two disjoint subsets of $\mathfrak{M}(\mathfrak{B})$ and let H_0 (H_1) be the hypothesis stating that the unknown distribution is in M (M'). In Neyman's terminology H_0 can be consistently tested against H_1 if to any preassigned $\epsilon > 0$ there exists an integer n and a critical region in the product-space of n independent observations such that the probabilities of the errors of the first and second kind corresponding to this region are simultaneously smaller than ϵ. A sufficient condition which for a certain type of consistent test is also necessary is established. The condition is satisfied whenever the disjoint sets M and M' are closed and compact with respect to a certain suitable topology introduced on $\mathfrak{M}(\mathfrak{B})$. Thus for instance H_0 can be consistently tested against H_1 if M and M' contain only a finite number of measures or if the measures in M resp. M' depend continuously on a parameter ranging over a closed and bounded subset of some Euclidean space.

3. **Effect of Linear Truncation in a Multinormal Population.** Z. WILLIAM BIRNBAUM, University of Washington, Seattle.

Let $(X, Y_1, Y_2, \cdots, Y_{n-1})$ have a non-singular n-dimensional normal probability density $f(X, Y_1, Y_2, \cdots, Y_{n-1})$ for which all parameters are given, and let $\varphi(X, Y_1, Y_2, \cdots, Y_{n-1})$ be the probability density obtained from f by truncation along a given hyperplane: $\varphi = Cf$ for $a_1Y_1 + \cdots + a_{n-1}Y_{n-1} \leqq aX + b$, $\varphi = 0$ elsewhere. What is the marginal distribution of X for this truncated distribution? This question can be answered by using a set of tables with only two parameters. These tables make it also possible to solve problems such as: determine the plane of truncation so that the marginal distribution of X has certain required properties. (This paper was prepared under the sponsorship of the Office of Naval Research.)

4. **Statistical Problems in the Theory of Counters.** (Preliminary Report). COLIN R. BLYTH, University of California, Berkeley.

The assumptions made about counter action and distribution of incident particles are the same as those of B. V. Gnedenko [On the theory of Geiger-Müller counters, *Journ. Exper. i Teor. Phiz*, Vol. 11 (1941)]. The distribution of the number X of particles registered during a given time $(0, t)$ is found explicitly, in terms of the density $a(v)$ of incident particles at time v. The problem considered is that of estimating the parameters of $a(v)$. For the special case $a(v) = a$, the distribution of X reduces to $P\{X = x\} = a^x(t - x\tau)^x$ exp