86. W. K. Feller: *On a probability limit theorem of H. Cramér.*

Let $\{X_k\}$ be mutually independent random variables whose first moments vanish and whose second moments are σ_k^2; let $s_n^2=\sigma_1^2+\cdots+\sigma_n^2$. In various applications one is concerned with the distribution function $Pr\{X_1+\cdots+X_n>xs_n\}$, where $x\rightarrow\infty$ as $n\rightarrow\infty$. The simplest binomial case has been studied by A. Khintchine, P. Lévy, Smirnoff and others. H. Cramér found a complete description of the asymptotic behavior of the above sums in the case where all X_k have the same distribution function. This theorem is generalized to the case of unequal components. The theorem is to serve as a base for a solution of the "problem of the iterated logarithm" in the general case. (Received November 21, 1942.)

87. W. K. Feller: *On the general form of the so-called law of the iterated logarithm.*

Let $\{X_k\}$ be a sequence of mutually independent random variables whose first moments vanish and whose second moments are σ_k^2; let $s_n^2=\sigma_1^2+\cdots+\sigma_n^2$. A sequence of numbers $\phi_k\uparrow\infty$ is said to be of upper (lower) class if the probability that $X_1+\cdots+X_n>s_{n_k}\phi_{n_k}$ for infinitely many k is one (zero); any sequence $\{\phi_k\}$ is either of upper or of lower class. A n.a.s. condition is found for a sequence $\{\phi_k\}$ to belong to the upper class. It generalizes the condition found by Kolmogoroff and Erdös in the special case where X_k assumes the values ± 1 only, each with probability 1/2; however, it is different in form. The new theorem also contains a result of Marcinkiewicz and Zygmund on the necessity of the condition imposed by Kolmogoroff on the X_k in his proof of the law of the iterated logarithm. (Received November 21, 1942.)

88. P. G. Hoel: *On indices of dispersion.*

The sampling distribution of the index of dispersion for binomial and Poisson distributions is investigated by means of semi-invariants. Approximations to terms of order N^{-3} are obtained for the descriptive moments of the distribution, by means of which the accuracy of the chi-square approximation can be determined. (Received October 30, 1942.)

Topology

89. R. F. Arens: *Homeomorphism groups of a space.* Preliminary report.

Let A be a locally bicompact, locally connected Hausdorff space, and let G be a group of homeomorphisms of A. Then there is a certain topology N making G into a topological group (Pontrjagin, *Topological groups*, Princeton, 1939). This topology N is the weakest admissible topology that can be introduced into G, in this sense: Sets in G open by N are open by any other admissible topology M. A topology M for a group of homeomorphisms, G, of a space A is called admissible if by using that topology for G the two functions $g(a)$ and $g^{-1}(a)$, where $g\in G$ and $a\in A$, become continuous functions of both arguments g and a simultaneously. The topology N is determined by the following system of neighborhoods of the identity in G: Select in A an open set W whose closure is bicompact, and another open set whose closure K is contained in W. Then the set U of all $g\in G$ which transform K into W is defined to be a neighborhood of the identity. The set of all such U together with all their finite