

obtains the asymptotic distributions of a large class of functions of these runs. An example of his results is the following: It is proved that the following are asymptotically normally distributed: (a) the total number of runs; (b) $R(p)$, the number of runs of length p ; (c) $R(p)$ and $R(q)$ jointly. Similar results are obtained for runs defined by any of a large set of criteria, of which the one given above is of value in statistical applications. (Received May 1, 1943.)

TOPOLOGY

198. Paul Alexandroff: *On homological situation properties of complexes and closed sets.*

The purpose of this paper is to find and to study topological invariants which connect the homological properties of a space K with those of its closed subset A and of the open complement $G = K \setminus A$, and thus contribute to characterize from the homological point of view the *situation of A in K* . Thus the paper constitutes an extension of results already known when K is simply connected (when its β groups are 0 and also when K is a manifold). (Received April 3, 1943.)

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- HAMMOND, J. R. Concise spherical trigonometry with applications and reviews of solid geometry and plane trigonometry. Boston, Houghton Mifflin, 1943. 13+256 pp. \$2.20.
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