paper is a part of an article to be published in the December 1945 issue of the Bulletin of Mathematical Biophysics. (Received July 26, 1945.)

TOPOLOGY

185. R. H. Bing: *Collections filling up a simple plane web.*

It is shown that the compact continuum W is a simple plane web provided there exist an upper semicontinuous collection of mutually exclusive continua filling up W and another such collection H filling up W such that if g and h are elements of G and H respectively, then the common part of g and h exists and is totally disconnected. It is proved that if W has a bounded complementary domain and each of the collections G and H is a dendron with respect to its elements, then each is a non-equicontinuous collection. (Received June 25, 1945.)

186. R. H. Bing: *Generalizations of two theorems of Janiszewski.*

Janiszewski proved that if H and K are continua neither of which cuts the plane, then the sum of H and K cuts the plane only if the common part of H and K is not connected. The present paper gives generalizations of this result by considering more general sets than continua. It is shown that if H and K are two sets of which neither cuts the point A from the point B, $H \cdot K$ is connected, $H - H \cdot K$ is compact and $H - H \cdot K$ and $K - H \cdot K$ are mutually separated, then $H + K$ does not cut A from B. Also, if H and K are connected sets one of which is compact, H is countinuumwise connected and $\bar{H} \cdot K + H \cdot \bar{K}$ is the sum of two mutually separated sets each containing a point of H, then $H + K$ cuts the plane. (Received July 23, 1945.)

187. J. C. Oxtoby: *Invariant measures in groups which are not locally compact.*

In any complete separable metric group which is dense in itself it is possible to construct a left-invariant measure, defined for all Borel sets and zero for points; but such a measure cannot be locally finite, nor can every compact set have finite measure, unless the group is locally compact. This result is proved independently of Haar's theorem, and the measure constructed may have properties quite unlike Haar's measure. Other constructions, based on the idea of extending a Haar measure from a subgroup, or introducing a new topology, are considered and their limitations discussed. The results throw light on Weil's converse of Haar's theorem by giving examples of measures that fail to satisfy Weil's postulates, and by showing that there is a class of groups in which no Borel measure can satisfy them. (Received July 23, 1945.)

188. Moses Richardson: *On weakly ordered systems.* Preliminary report.

A *weakly ordered system* is a system of elements $a, b, \cdots$ with a binary relation $\succ$ such that (1) $a \succ b$ implies $a \neq b$, and (2) $a \succ b$ implies b not greater than a. Transitivity is not assumed. Such a system can be represented by an oriented 1-complex or linear graph in an obvious way. J. von Neumann and O. Morgenstern (*Theory of games and economic behavior*, Princeton, 1944) prove the existence of "solutions" for the case of a strictly acyclic system, and give a method of constructing such solutions. The main result of the present note is the existence and construction, by a