The uniqueness of finite geometries with less than 6 points on every line was first proved by J. H. M. Wedderburn and O. Veblen [4]. The uniqueness of finite geometries with 6 points on every line was first demonstrated by C. R. MacInnes [5] in a rather laborious tactical enumeration of cases.

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SOME THEOREMS ON CO-TERMINAL ARCS

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It is the purpose of this note to prove certain properties of sums of simple arcs which have one or both end points in common. The investigation was undertaken to answer a question, that of the validity of Theorem 3 below, raised by Miss Harlan C. Miller. An example is included to show that two of the results obtained are not valid for irreducible continua in general.

Theorem 1. *If H and K are two distinct arcs from A to B, then each point of $H+K-H\cdot K$ belongs to a simple closed curve lying in the closure of $H+K-H\cdot K$.*

Proof. Let P be any point of $H+K-H\cdot K=N$, and let S be the component of N which contains it. The set S is an arc segment; let its end points be X and Y. Suppose that no simple closed curve lying in $\overline{N}$ contains P. Then $\overline{N}-S$ contains no continuum containing both X and Y, for if it did it would contain an arc from X to Y, and this arc plus S would be a simple closed curve lying in $\overline{N}$ and contain-

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