NUCLEAR POINTS IN THE THEORY OF ABSTRACT SETS*

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1. *Introduction.* E. W. Chittenden has published an interesting note† in which he gave necessary and sufficient conditions that a set E contained in a class (V) (of Fréchet) be perfectly compact, or perfectly self-compact.‡

Chittenden proves the following theorems:

THEOREM I. *If an infinite set E is perfectly compact, E determines at least one nuclear point.*

COROLLARY. *Every set E which is perfectly self-compact contains a nuclear point.*

THEOREM II. *If every infinite subset of a set E of points of the space P determines a nuclear point then E is perfectly compact.*

THEOREM III. *A necessary and sufficient condition that a set E be perfectly compact is that every infinite subset of E determine at least one nuclear point.*

COROLLARY. *A necessary and sufficient condition that every compact set E be perfectly compact is that every infinite compact set E possess at least one nuclear point.*

The proofs of Chittenden are based on the following assumption (§ 3): "Let Q be an aggregate of power μ and of elements q. Of the transfinite ordinals Ω of which the aggregate of all ordinals $\alpha<\Omega$ has the power μ there is a least, Ω_0. Let

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† This BULLETIN, vol. 30 (1924), p. 511.

‡ For the definitions of the terms *class* (V), *monotone sequence, compact, perfectly compact, perfectly self-compact, limit point, nuclear point,* see E. W. Chittenden, loc. cit. §§2, 4. A topological space in which every infinite set determines a nuclear point is called by P. Alexandroff and P. Urysohn a *bicompact* space (see MATHEMATISCHE ANNALEN, vol. 92 (1924), p. 260).