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A REMARK ON DENSITY CHARACTERS

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Let X be an arbitrary topological space satisfying the T_0-separation axiom [**1**, Chap. 1, §4, p. 58].[2] We recall the following definition [**3**, p. 329].

DEFINITION 1. *The least cardinal number of a dense subset of the space X is said to be the density character of X. It is denoted by the symbol $\Xi(X)$.*

We denote the cardinal number of a set A by $|A|$.

Pospíšil has pointed out [**4**] that if X is a Hausdorff space, then

$$|X| \leqq 2^{2^{\Xi(X)}}. \tag{1}$$

This inequality is easily established. Let D be a dense subset of the Hausdorff space X such that $|D| = \Xi(X)$. For an arbitrary point $p \in X$ and an arbitrary complete neighborhood system $\mathcal{U}_p$ at p, let $\mathcal{D}_p$ be the family of all sets $U \cap D$, where $U \in \mathcal{U}_p$. Thus to every point of X, a certain family of subsets of D is assigned. Since X is a Hausdorff space, $\mathcal{D}_p \neq \mathcal{D}_q$ whenever $p \neq q$, and the correspondence assigning each point p to the family $\mathcal{D}_p$ is one-to-one. Since X is in one-to-one correspondence with a sub-hierarchy of the hierarchy of all families of subsets of D, the inequality (1) follows.

It may be remarked in passing that the inequality (1) does not obtain for all T_1-spaces. Let $\mathfrak{m}$ be a cardinal number greater than $2^{\mathfrak{c}}$, where $\mathfrak{c} = 2^{\aleph_0}$. Let Z be a T_1-space of cardinal number $\mathfrak{m}$ and with the property that the only closed proper subsets of Z are finite or

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[2] Numbers in brackets refer to the Bibliography at the end of the paper.