Naimpally, S. A.; **Piotrowski, Z.**; **Wingler, E. J.**
Plasticity in metric spaces. (English) ⌐Zbl 1083.54016⌐
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Recall that a mapping f from a metric space (X,d) into itself is called non-contractive if $d(f(x),f(y)) \geq d(x,y)$ for all $x,y \in X$. The authors call a metric space (X,d) an EC-space if every noncontractive bijection from X onto itself is an isometry. A metric space that is not an EC-space is called an NEC-space. The following results are obtained. Theorem 1. Every totally bounded metric space is an EC-space. Theorem 2. The set $\mathbb{Z}$ of integers with the usual metric is an EC-space. Theorem 3. $\mathbb{R} \setminus \mathbb{Z}$ with the usual metric is an EC-space. Theorem 4. A convex subset of the Euclidean space $\mathbb{R}^n$ is a hereditary EC-space if and only if it is bounded. Theorem 5. If (X,d) is a connected, compact, metric space, then $X \times \mathbb{Z}$ (endowed with the usual product metric) is an EC-space. Theorem 6. $[0,1) \times \mathbb{Z}$ is an NEC-space (although $[0,1] \times \mathbb{Z}$ is an EC-space by the preceding theorem). Theorem 7. If C is the Cantor set, then $C \times \mathbb{Z}$ is an NEC-space. Theorem 8. Every unbounded metric space with at least one accumulation point contains an NEC-space. Theorem 9. If X is an NEC-space, then $X \times Y$ is an NEC-space for any metric space Y.

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