two points a and b, and an infinite sequence

$$\mathcal{D}_1, \mathcal{D}_2, \ldots, \mathcal{D}_n, \ldots$$

of chains of discs, satisfying, for every $n \in \{1, 2, \ldots\}$, the following conditions:

1^o the point a belongs to the first, and the point b to the last link of the chain $\mathcal{D}_n$;

2^o the diameter of every disc in the chain $\mathcal{D}_n$ is less than $\frac{1}{n}$;

3^o the chain $\mathcal{D}_{n+1}$ is crooked in the chain $\mathcal{D}_n$.

Thus, for example, the chain $\mathcal{D}_2$ is crooked in the chain $\mathcal{D}_1$, and the chain $\mathcal{D}_3$ is crooked in the chain $\mathcal{D}_2$ (on Figure D only a part of the chain $\mathcal{D}_3$ is presented). The foldings are more and more condensed and they overlapped themselves. Denote by K_n the union of all links of the chain D_n. From condition 3^o it follows in particular that the each next chain refines the previous one, and therefore the continua K_n form a decreasing sequence

$$K_1 \supset K_2 \supset \ldots \supset K_n \supset \ldots$$

The *Pseudo-arc* K is defined as the common part of all continua K_n, i.e.,

$$K = \bigcap \{K_n : n \in \mathbb{N}\}.$$

By virtue of condition 1^o points a and b belong to the continuum K, thus it is nondegenerate. We shall prove that the continuum K is hereditarily indecomposable.Let $K' \subset K$ be an arbitrary continuum. To prove that the continuum K is indecomposable it is enough to show that every continuum $Y \subset K'$ distinct from K' is nowhere dense in K'. Consider an arbitrary point $p \in Y$ and number $\varepsilon > 0$.

Since $K' \neq Y$, hence there is a point $q \in K' \setminus Y$ which therefore is at a distance at least $\eta > 0$ from each point $y \in Y$, where η is a fixed number, independent from y. In fact, if not, then some points of the set would be arbitrarily close to the point q, and so the point q would belong to the closure of the set Y, which is impossible, because the set Y is closed, and it does not contain the point q. Let us take a natural number n so large that the inequalities are satisfied

$$\frac{2}{n} < \varepsilon \quad \text{and} \quad \frac{3}{n} < \eta.$$

Denote by D_i and D_j (with $i \leq j$) the links of the chain $\mathcal{D}_n$ whose union contains the points p and q. Since $p \in Y$, hence $\rho(p, q) \geq \eta$, (here ρ means the metric in the plane) and thus it follows that between the links D_i and D_j there are at least two links of the chain $\mathcal{D}_n$. Indeed, in the opposite case the links D_i and D_j would have a neighbor common link, and choosing suitable points p' and q' in the intersections of this link with the links D_i and D_j we would have

$$\rho(p, q) \leq \rho(p, p') + \rho(p', q') + \rho(q', q) < \frac{1}{n} + \frac{1}{n} + \frac{1}{n} = \frac{3}{n} < \eta$$