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ON THE GENESIS OF TECHNICAL OBJECTS

Abstract

Hegelian dialectic is often considered as one of the theoretical foundations of the history of technology. However, its application to engineering systems has some difficulties since it has been designed for an artificial object - "absolute idea", which does not appear and disappear, and does not interact with other objects. Still these moments are essential to the emergence and development of technical objects (systems).

Respectively, the problem of genesis of its objects is extremely important for the history of technology - not less important than the corresponding problem for biological objects. Regarding the latter, significant progress has been observed in this area, so a certain parallel with the technical objects could be useful for solving the problems of its genesis.

In both cases we are talking about establishment of a complex material structure infeasible without pre-recorded information model. Relevant material formation for biological organism is a genotype determining the nature of the processes in the organism, causing its determined structure (kind of ingenious "flow chart"). It is quite natural to anticipate something like this also in relation to technical device – something like "technical genome".

Meanwhile having some similarities there are also some differences. First, biological organism does not emerge at once. It gradually develops in the medium, while the technical object emerges there directly in its more or less "off-the-shelf" form. Second, in the process of its formation biological organism is, in this sense, self-sufficient, since its genotype is localized in the organism-itself; while technical object does not contain any proper information model.

The model of future technical object appears first in the consciousness of its creator, and the real technical object is its material objectification. Moreover, in contrast to biological objects, its genotype, existing in the consciousness, fixes just functional structure of the object (a kind of a "model")

However, the complexity of technical objects, as well as the need for coordination of activities in the process of its creation has led to external fixation of its "ideal models" in some (intermediate between ideal model and its material realization) symbolic form - technical document (drawings, diagrams, description, as well as mathematical, physical or computer model).

Similar to biological object any changes in technical object are only possible on condition of appropriate changes in its "genotype" (especially in relation to mass production). These changes, as in case of biological object, occur through mutations - sudden and random changes of "genotype." However, the "external" nature of "genotype" for technical object enables inheriting also "phenotypic" changes of a technical object that does not happen with biological objects.

These changes are transmitted "as inherited" to the next generations of relevant objects: in biological - as a result of natural selection, in technical - as a result of social practice. However, the same "external" nature of technical "genome" provides also the possibility of informative selection on the document's stage.

Keywords: genesis of a technical object, genotype, technical document, mutation, the laws of the development of technology.

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