

**DEVELOPMENT OF MODELLING WITH APPLICATION OF THE THEORY AND
METHODS OF SIMILARITY IN AGROPHYSICS**

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The epistemology of science lies in the model of its gradual development. The essence of the model is expressed in the statement of I. Newton, according to which the origins of any new knowledge can be found in the past, only an attentive attitude, careful study of works of the predecessors and the contemporaries are necessary. The paper presents the description of the experience and history of application of the similarity theory and modeling methods at the Agrophysical Research Institute in the studies of energy and mass transfer processes in the soil and the near-ground layer of air; growth and development of plants; successions of geobiocenoses. The paper is a review of the history of physical modeling at the Agrophysical Research Institute since the time when the institute was found in 1932. The introduction presents the history of the Physico-Agronomical (later – Agrophysical) Institute, a brief definition of the theory and the method of similarity, the justification of its applicability to agrophysical tasks and the purpose of the paper. The first three chapters describe the completed studies on the history of physical modeling with application of the similarity theory: the development of methods of similarity and modeling in soil hydrophysics; application of the similarity theory and dimension analysis in studies of the soil structure and soil mechanical properties; the development of soil thermal physics on the basis of physical modeling and similarity. The fourth chapter discusses the significant differences between indicators and indexes from the criteria of physical similarity and the possibility of the similarity theory application in the microclimatology.

Key words: similarity theory, physical modeling, history, review.