MATHEMATICAL SIMULATION OF CAUSE-AND-EFFECT RELATIONS FOR REVEALING OF ANCIENT ECOSYSTEM.

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Significant body of data about paleoclimatic conditions of species existence consists of different maps. Analysis of such data, as well as of any non-numerical data, can be carried out by means of mathematical logic methods and software tools, based on the simulation of cause-and-effect relations. Among problems which may be solved with the help of these methods is the revelation of dependences between the origin or abundance of species and the expression of these dependences by Boolean algebra formulas.

Processing of data by means of the computer expert system, realized mathematical logic tools, consists of two stages.

a. Arcertaining of a set of paleoclimatic features (causes) related to the species (effect) under study.

b. Revealing of favourable combinations of such features which are complexes of necessary and sufficient factores.

Each revealed complex is responsible for the origin (abundance) of the species under study and all complexes are independent between them. Thus, one factors complex together with the species can be considered as a separate ecosystem. Each such ecosystem has a mathematical description by means of a Boolean algebra formula expressing a functional connection between the byological object and paleoclimatic conditions.

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