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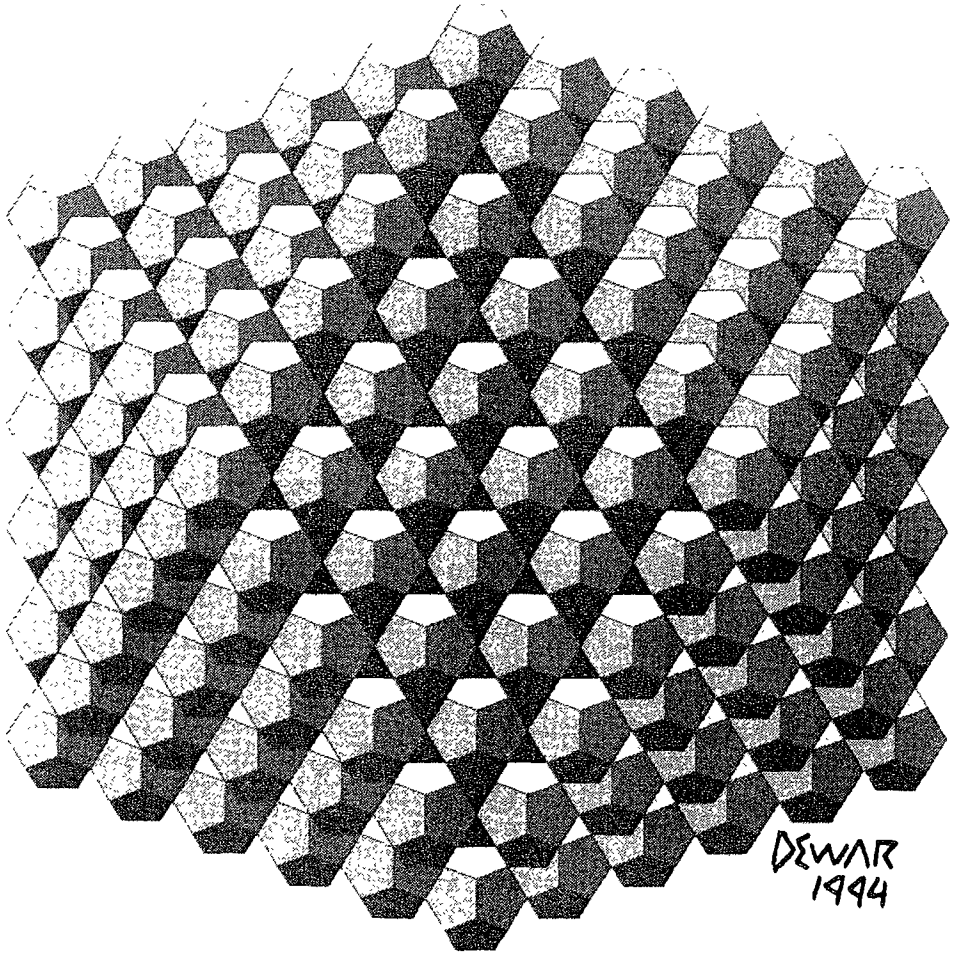

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SYNERGETIC ASPECT IN SYMMETRY EVOLUTION

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The examination of an artificial or natural object in symmetrical aspects without any dependence on it's origin supposes a closed set of elements and their connections order. All the properties of the object and it's symmetry depend on the order of these connections. It is potentially possible to vary the object's properies by changing it's environment within the limits which enable it's existance and preserve symmetry. Anyway, this changing is possible by interacting with some other objects, probably artificial. For example, the symmetry system that includes a lot of conceptions, axioms, theoremes etc. and the other elements is an artificial object. The symmetry preserving implies existance of all elements, connections and conforming paramenters which are immutable in all the variants of interactions with the environment. All these variants of interactions should lead to the permissible values of the other parameters.

The objects, for which the evaluation of all parameters from the certain list is possible, form a unique set. Within the set, due to external conditions changing the evolution of the objects and their symmetry is possible up to the phase transitions. Evolutionary changes are specified by changing the values of some certain parameters within the limits of individual object's features preserving. As the limiting values are being reached the phase transition may be observed. At this moment at least one of the parameters from the list that identifies each object from the set is changing it's value by a descrete step.

The analisys of these possibilities and some results implies the objects proximity measure evaluation that determines the way of transforming and our benefits or

expenses. The universal space for this analisys within the set of any origin is one that is determined by the 3-D basis with the following components:

- the number of freedoms - i.e. the number of mutually independent inner parameters those are capable of monotonous varing within the permissible limits according to the monotonous environment varing;

- the stabilization degree - i.e. the number of non-equal parameters those remain unchanged while varing free parameters and the following condition is required: each of them is potentially capable of monotonous changing of at least one object;

- the potential - i.e. the quantity that is determined by our expenditure on the creation of the object with certain partameters using the elements which are common for the whole set.

Besides all these values each object is marked by an unique identifier that consists of lingual elements which reflect each of the common list parameters (and the potentials) in the uniform order.

The common list parameters may be homogeneous if they are equal for at least one object and otherwise they are not homogeneous. For example, the angles of any triangle form the one group of homogeneous parameters, the lenghtes of the sides form the other homogeneous group but the angles and sides together form unhomogeneoug group.

Within the homogeneous group any combination of free parameters may be allowed. The combination of homogeneous and unhomogeneous parameters may be not permitted (for example, the triangle with the different angles a,b,(180-a-b) and equal sides A, A, A). The other combinations of unhomogeneous parameters are metastable, i.e. they may exist but they get broken if even a small environment changing occurs. It is so with the triangle with the angles a,b,(180-a-b) and sides A,B,C.

Two first components of the basis are discrete by definition but the value of the potential may vary continiously and monotonously while two other components are

fixed. So, the object state may be visualized as an interval that is parallel to the potential axis or as just a point.

The external impact vector connects two points in the space: the former corresponds the current state of the object, the latter corresponds the state of the other stable object or some metastable state. Also the second point may belong to an empty interval.

According to this point of view the different external impacts may be used for changing one component of the object vector or a couple of them or all of them. Whatever the external impact vector direction the object inner changes are aimed at getting the balance of interaction with the environment through changing the potential while the entropy is maximal.

The external impact result may be a transition to the other stable state, to the metastable state with the following transition to some stable state or decay. In the first two cases the situation is obvious. Otherwise, if the external impact vector leads to the empty interval the object decay may be a compensation. The required potential value is formed of a proportional combination of potentials of at least two objects. In case of decay the entropy rises because the free parameters number of the composition after decay is not less than before. In any transitions one of free parameters is the leading one, it is called "the order parameter" in synergetics. This parameter is first to reach it's limiting values while the external conditions are changing monotonously.

Hence, the situation when two or more parameters take their limiting values needs special coordination and extra energy.

It is obviously that the transition representing that uses the "assembly" equation coordinates and our approach have much in common.

Using these estimations, we've compared transitions within the limits of number of sets of different complication and capacity: triangles, Bravais lattices, classes of

symmetry, all the regular systems of points from plane and Fedorov groups of symmetry and also phase states of ice.

It may seem unexpected, but such a synergetical method is quite applicable to chess and other logical games. In the situations like these one order turns into other by the certain rules. Deviations from the initial order is accompanied with its destroing through increasing of degrees' of freedom number; creation of new order causes its decreasing. There is no initial order in a game "noughts and crosses", and the game consist in creation of new one with decreasing of degrees' of freedom number.

Comparison the offered sheme of estimations with generally accepted ones confirmed its universality, synegergetical richness of content, objectivity and fine pictoriality.

Logical games consist in reaching an aim beginning from the certain start position and taking into concideration opportunities and restrictions, determined by the rules. They must ensure objective estimation of partners' actions during the party or on the completion of it. Otherwise, adopted decisions may impede and even exclude attaining of the aim with objectively correct actions.

Really, reaching of a goal by a shortest path (permitted by rules) becomes possible because of strict correlation of influence on a lots of factors. However, expenses on correlation itself will increase expenditures on the way to the win. It will take place even in the case when the next step is not directed straight to the aim. Sometimes these expenses justify themselves on wins, but still far from always. The level of estimation's objectivity is particularly essential, when writing computer versions of logical games.

Now we develop the playing and training chess programs and computer versions of other logical games.