SYMMETRIES OF BIOTISSUE MOSAICS

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Well known symmetries which widely are used in Science and Art, we can name as *symmetries of metric overlaps.* Other class of *symmetries of topological overlaps* can be defined for structures at absence of properties of metric regularity. For example, it is possible to make for the graphs, having a topological regularity.

For the biological applications the special interest is represented by transformations of multicellular mosaics of biotissues, which are derivated by divisions of cells. Let the flat mosaic will be formed of densely packed polygonal cells. Then each cell is characterized by number of the sides p, which equally to number of its neighbors. The cells refer to as neighbors, if they have a common edge. The edges of intercellular borders form connected flat graph G_s, which is possible to consider homogeneous on number v of edges, converging to vertices. Usually the connectivity of edges is identical and s = 3.

However the different cells in real mosaics have different number of the neighbors. The topological structure of a -mosaic is described by probabilities distribution function $f(p)$ - it is probability of an any cell to have the number of neighbors equals p.

The division of one cell is graphically represented by addition of a new internal edge, which connects an any pair of the opposite sides. In this case one cell will be transformed to a pair of the next daughter cells. We shall name synchronous division of all cells as transformation of division of cells and we shall designate by a symbol D. In a general case the transformation changes topology of neighborhoods: if before division the mosaic is described by function $f_1(p)$, after division new function $f_2(p)$ is possible, i.e. the transformation of division is possible to characterize as functional transformation

$$D: f_1(p) \longrightarrow f_2(p)$$

The transformation of division of a flat mosaic refers to as symmetric, when the mosaic will be transformed to a topologically equivalent mosaic of daughter cells. Or else, when topological invariance takes place,

$$D: f(p) \longrightarrow f(p)$$

The rules, ensuring *symmetric transformation of division* (STD), are investigated for casual mosaics and for a regular mosaic, when all cells are the regular hexagonal (for all cells $p = 6$). In the last variant each STD will transforms a hexagonal mosaic of parent cells to a similar mosaic of daughter cells. For hexagonal variant classification of regular packings of daughter cells of different generations is received.