ABSTRACT PROCEEDINGS

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Paper 54: Geosuccession - changes of morphogenetic domains as an amendment in the holistic theory of nature

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A morphogenetic domain is an undefined taxonomic spatial unit corresponding to a morphological landscape produced by strictly specified morphogenetic factors and processes. Seven types of domain can be distinguished: morphogenetic category, morphogenetic complex, morphogenetic pattern (=subsystem), morphogenetic system (=morphosystem), morphogenetic region, morphogenetic zone, and morphogenetic province. The causes and controls of change in a morphogenetic domain or domains affect the quality, range and stage of geosuccession. So, geosuccession is a complex and usually long-term phenomenon taking place in a certain taxonomic spatial unit and embracing a set of geographical processes transforming the morphogenetic domain existing in it thus far into a different one. Geosuccession results in overlapping qualitative and quantitative changes in geomorphic processes that occur at a spatio-temporal scale, and alter the style of functioning of the morphogenetic domain. The fact that the sequence of landscape changes is so widespread obliges one to formulate terminological foundations of geosuccession in order to systematise the observed, measured and described transformations of the relief. The exploration to date indicates that the most distinctive and spectacular geosuccession occur in the polar regions, but not only there. The rapid recession of glaciers observed in the polar regions and the research conducted in the Svalbard (the Arctic) and South Shetland (Antarctica) archipelagos indicate landscape metamorphosis to be widespread in paraglacial areas. Nowadays, the most dynamic property of glaciated regions is their shrinkage, a dwindling of area. Emerging from under the disappearing glacial landscapes are usually surfaces with a thick mineral cover, mainly regolith, morainic or weathered; less frequently rocky. The paraglacial concept emphasises the relatively rapid adjustment of postglacial landscapes to non-glaciated conditions through a heightened activity of a wide range of subaerial processes in a variety of environments. In this context, polar oases developing as a result of the retreat of glaciers due to global warming should be considered the most paraglacial areas today. The absolute condition for the existence of the polar oasis geoecosystems is a periodic occurrence of temperatures above freezing point which will allow the development of a network of streams and possibly bodies of water, which in turn will provide a sufficient starting point for the development of denudation processes (e.g., erosion or chemical denudation, etc.) and biogenic processes. These polar oasis geoecosystems are excellent example of geosuccession in statu nascendi. The sensitivity of morphogenetic domains is thus an attribute of geosuccession which manifests itself in the enrichment or depletion of their geodiversity. A crucial feature of geosuccession is that it precedes succession (in the sense of biological succession) in the natural environment which occurs just at the stage of a morphological climax, a top stage of geosuccession. This interpretation of geosuccession has its methodological roots in the holistic theory of nature, which perceives it as complementary to phenomena taking place in the biosphere.