

## Major aspects of evolution of the graptolites

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The sequences of graptolite faunas, originations and extinctions, origin of new morphological types, and palaeobiogeographical provinces are aspects of graptolite evolution which may be interpreted in terms of their essential coloniality, their change from benthos to plankton, inbreeding and outbreeding, genetic polymorphism and in terms of anagenetic and cladogenetic grades. Within this framework several topics are discussed which have been variously favoured over the years by neontologists and palaeontologists alike, to wit: neotony, paedomorphosis and recapitulation; adaptiveness and preadaptation; phyletic gradualism and punctuated equilibria; mosaic evolution, convergence and parallelism; orthogenesis, programme evolution and the theory of trends; penetrance and expressivity of biocharacters; and Cope's Rule. Some of these are rejected as untenable in a modern context and the others are considered against the evolutionary patterns peculiar to graptolites, and their major adaptive trends through time.

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