

- Australia. *Transactions of the Royal Society of South Australia* 73, 72–99.
- Sun, W.-G. 1986: Late Precambrian scyphozoan medusa *Mawsonites randellensis* sp. nov. and its significance in the Ediacara metazoan assemblage, South Australia. *Alcheringa* 10, 169–181.
- Trusheim, F. 1930: Spülsäume am Meeresstrand. *Natur und Museum* 61, 112–120.
- Wade, M. 1968: Preservation of soft bodied animals in Precambrian sandstones at Ediacara, South Australia. *Lethaia* 1(3), 238–267.
- Wade, M. 1969: Medusae from uppermost Precambrian or Cambrian sandstones, central Australia. *Palaeontology* 12(3), 351–365.
- Wade, M. 1971: Bilateral Precambrian chondrophores from the Ediacara fauna, South Australia. *Proceedings of the Royal Society of Victoria* 84(1), 183–188.
- Wade, M. 1972: Hydrozoa and scyphozoa and other medusoids from the Precambrian Ediacara fauna, South Australia. *Palaeontology* 15(2), 197–225.
- Walcott, C. D. 1898: Fossil Medusae. *U.S. Geological Survey Monograph*. 30, 201 pp.



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## Phylogenetic aspects of Palaeontology – XXXV Session of the USSR Palaeontological Society

V. A. KRASSILOV

A notorious indifference to both the cladistic methodology and the idea of punctuated equilibrium has made Soviet palaeontologists a somewhat isolated group. The objectives of the XXXV Session of the USSR Palaeontological Society 'Phylogenetic aspects of Palaeontology' (Leningrad 23–27 January 1989) were to review and update general principles and guidelines of phylogenetic investigations pertinent to classification and stratigraphy. About 50 papers were presented. A few analysed rationales of the evolutionary and cladistic methodologies. V. A. Krassilov (BPI, Vladivostok; for abbreviations of institutes, see below) argued that repeatability of classification is hardly a criterion of its scientific objectivity, because the more artificial classification is (e.g. alphabetic one), the more exactly it can be reproduced by independent investigators. Moreover, parsimony is not a natural but a mental phenomenon; its usefulness in natural classification is therefore questionable. At the same time, evolutionary methodology has been accused of obscurity of its basic concepts. Evolutionary classification has to reflect the major features of evolutionary process, which are periodicity, parallelism, adaptability and mosaic pattern of change. The first two make grades irreducible, the third one bounds sister groups in clusters of adaptive radiation and the fourth one underscores recognition of transitional forms as mixtures of primitive and advanced characters. L. A. Nessonov (Leningrad University) advocated a synthetic approach to classification, using clades and grades as manifestations of cladogenesis and anagenesis, respectively.

V. J. Davydov and G. N. Vassilieva (VSEGEJ, Leningrad) found a fairly similar pattern of evolutionary stages in such unrelated groups as foraminifera and land plants. Their classifications imply that the taxonomic rank of a group depends on its cladogenetic vigour. M. N. Kaznyshkin (Central Museum of Geology and Exploration, Leningrad) proposed a new system of lungfishes based on the dental plate number and morphology. He recognized four families conceived of as evolutionary grades. B. V. Koczyrkevich (BPI, Vladivostok) described parallel evolution in pentamerid brachiopods resulting in Rhynchonellida as a grade order. He compared 'rhynchonellisation' to similar processes in land mammals and plants ('mammalisation' and 'angiospermatization', respectively). A. N. Solovjev (PIN, Moscow) studied evolutionary transition from regular to irregular echinoids and revealed transitional forms in the Jurassic families Pygasteridae, Galeropygidae and Collyritidae, each of which show a mosaic pattern of evolutionary change. V. N. Ovcharenko (IG, Dushanbe) spoke of 'clandestine' transitional forms (i.e. showing internalized transitional characters) in terebratulid brachiopods.

Traditional for Russian evolutionists are studies based on A. N. Severtsov's ideas relating the significance of evolutionary change (partly in terms of taxonomic rank) to ontogenetic stages which had been affected in the first place, i.e. the early stage 'archallactic' changes could be of more profound taxonomic consequence than the median (deviation) or late (anaboly) stages. O. L. Kossovaja (VSEGEI, Leningrad)

ascribed the origin of the Palaeozoic Rugosa families to arch-allactic changes, while genera resulted from deviations and species from anabolics. L. F. Plotnicova (IG, Kiev) emphasized anaboly as a leading mode of evolution in ataxophragmoid foraminifera, while deviations seem exceptional. According to S. V. Rozhnov (PIN, Moscow), monocyclic and dicyclic crinoids had repeatedly derived from polycyclic ancestors as neotenic forms. Neoteny could also be responsible for bilateral symmetry in the Calcarinacea (Disparida). Functional aspects of pre-adaptation conceivably related to the origin of osmoregulation in crustaceans and thermoregulation in vertebrates have been analysed by N. V. Aladin (Zoological Institute, Leningrad) and L. J. Khozatsky (Leningrad University).

A few palaeontologists, notably A. N. Oleinikov (VSEGEI, Leningrad) and Ju. J. Onoprienko (BPI, Vladivostok), have practised structuralist approaches to comparative morphology as a promising alternative to the traditionally more popular functional one. Y. A. Borissenko (Karkov University) studied structural vs. environmental control of shell mineralisation in calcitic and aragonite-calcitic bivalves.

For scientists brought up on Hegelian dialectics the gradual and punctuated changes are not mutually exclusive, hence their interests focus not so much on pace of speciation as on underlying forces. Stimulating work to this effect conducted by Nikolai Vavilov and his co-workers more than 50 years ago is reviewed by M. G. Agaev (Institute of Plant Breeding, Moscow). Krassilov, taking Vavilov's ideas as a starting point

promoted a model of cyclic speciation which proceeded from macropolymorphic linnaeons to monomorphic jordanons under the periodically fluctuating selective environment.

Practical aspects of phylogenetic reconstructions are related to biostratigraphy in which a phylozone is customarily considered a basic unit of geological correlation. Successions of phylozones reflecting certain evolutionary tendencies are described in the Palaeozoic foraminifera by V. J. Davydov (VSEGEI, Leningrad), in conodonts by A. V. Zhuravlev (IG, Sverdlovsk), who used biometric indices to characterise the polygnathid platform morphology, in nannoplankton by R. O. Koschkarly (IG, Baku) and S. A. Lyulyeva (IG, Kiev), in Cretaceous molluscs by M. S. Mesezhnikov (VNIGRI, Leningrad) and E. A. Zonova (VSEGEI, Leningrad), but they most conform to orthogenetic trends in lamnoid sharks studied by V. I. Zhelezko (IGG, Sverdlovsk).

Proceedings of the Session will be published by the 'Nedra' Publishing House, Leningrad.

*V. A. Krassilov, Institute of Biology and Pedology, 690022 Vladivostok 22, USSR; 8th May, 1989.*

*Note:* Abbreviations for institutes: BPI – Institute of Biology and Pedology, IG – Institute of Geology, IGG – Institute of Geology and Geophysics, PIN – Palaeontological Institute, VNIGRI – All-Union Institute of Oil Geological Exploration, VSEGEI – All-Union Institute of Geology.