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Foreword

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This issue of the journal presents a collection of articles based on the reports of the last two colloquia, the tenth and eleventh, held at the Borissiak Paleontological Institute under the general heading "Morphogenesis in individual and historical development". This series of colloquia resumed in 2023, after a forced two-year hiatus due to the restrictions of the Covid-19 pandemic. As before, the task of the organized colloquia was to develop mutual understanding between biologists of different specialties, especially paleontologists and neontologists, in the study of morphogenesis in ontogenesis and evolution. In addition to the staff of the Paleontological Institute, scientists from Moscow and St. Petersburg, Yekaterinburg and Tver universities, the Zoological Institute of the Russian Academy of Sciences, the Koltzov Institute of Developmental Biology of the Russian Academy of Sciences and the Severtsov Institute of Ecology and Evolution participated. The broad program of the colloquia is well reflected in the ten included articles.

The volume opens with a paper by S.D. Grebelny and N.Yu. Ivanova discussing the diversity of types of symmetry in Anthozoa. Although the study is based primarily on material of sea anemones and other non-skeletal representatives of the class, its conclusions are important for solving morphogenetic problems of skeletal symmetry in fossil corals. Undoubtedly, the new classification of the class Anthozoa proposed by the authors is also very interesting. A.S. Ermakov's review of the formation of modern mechanobiology examines the issues of integrity and regulatory capabilities of the early embryo in historical retrospect. The main attention is focused on experimental data from classical embryology with its concepts of morphogenetic fields, organizers, positional information and studies of the mechanodependence of morphogenesis. M.A. Nikitin and V.V. Aleshin in their review article discuss the important and complex problem of coding the body plan of Metazoa. The paper examines, in particular, a clear correlation between the loss of some *Hox* genes and the simplification of the body plan in the parasitic Orthonectida and Dicyemida, and the free-living Tardigrada and Rotifera. V.V. Isaeva interpreted cases of branching of the posterior part of the body of some species of polychaetes and terminal branching of rays in representatives of echinoderms as the emergence of a new unusual fractal pattern of axial organization of the body, which represents a macroevolutionary transformation of the ancestral plan of Bilateria. S.V. Rozhnov showed that the emergence of the first multicellular animals could have occurred in different ways and in parallel in several branches of ancestral choanoflagellates in the "oxygen oases" of the Proterozoic waters, reflected in modern modifications of the three classical hypotheses of Phagocytella, Gastraea, Synzoospores. D.E. Shcherbakov presented his views on the main evolutionary line of arthropods leading from polychaetes to insects and showed that many traits of arthropods were formed in Polychaeta—the most primitive Articulata. Thus, at a new modern level, he developed the views of the famous Soviet morphologist, embryologist and paleontologist Alexander Grigorievich Sharov (1922–1973), to whom he dedicated his article, as well as the classic scholar of Russian embryology O.M. Ivanova Kazas (1913–2015). A.M. Beregova, M.A. Nikitin, K.V. Mikhailov, and B.D. Efeikin wrote on comparative analytical examination in hairworms (Nematomorpha) and nematodes (Nematoda) of orthologs of genes involved in the development of eyes and limbs in better studied representatives of invertebrates and vertebrates. They suggested that fossil Palaeoscolecida are phylogenetically near Cephalorhyncha but are not a sister group or direct relatives of Nematomorpha. In the review and analytical article by O.N. Kotenko and A.N. Ostrovsky, the authors examined and classified the larval forms of bryozoans and discussed the ecological conditions for the amazing diversity of their larval development. It has been shown that in bryozoans, as in many other marine invertebrates, the transition from planktotrophic to endotrophic larvae occurred many times in various taxa. In his paper, G.V. Mirantsev presented images of Middle–Upper Carboniferous (Pennsylvanian) crinoids with aberrant branching of the arms from the Moscow region and showed that aberrations of the branching of the arms can be the result of both mechanical damage during incorrect (augmentative) regeneration and initial disturbances of the phenotype. The latter cases highlight the evolutionary potential of the group. The collection is concluded with a large article by A.E. Davydov, Yu.V. Yashunsky, G.V. Mirantsev, and A.A. Krutykh with a review of hypercalcified Calcispongia and a thorough comprehensive description of a new species in this group from the Gzhelian Stage (Upper Carboniferous) of the Moscow Region.

Thus, this collection, dedicated to various aspects of morphogenesis in individual and historical development, is of interest to general biologists. The organizers of the series of colloquia on morphogenesis hope that the publication of papers based on the materials presented there will help to promote new ideas in evolutionary developmental biology.