

Symbiogenesis: The New Principle of Evolution

Boris Mikhailovich
KOZO-POLYANSKY

1924

Translated from Russian and edited
by Victor Fet,
Marshall University, West Virginia

Originally published as *Novyi printsip biologii: ocherk teorii simbiogeneza* [The New Principle of Biology: An Essay of the Theory of Symbiogenesis], Puchina, Leningrad-Moscow, 147 pp. We have changed the title and taken other liberties with the text with one goal in mind: to communicate Kozo-Polyansky's brilliant work and to show its relevance to modern biology.

Table of Contents

Introduction

Foreword

A few words about Kozo-Polyansky Victor Fet

Preface

- I. Non-cellular organisms (cytodes) and the bioblast
 1. Bioblast of bacteria
 2. Bioblast of Cyanophyceae, or blue-green “algae”
 3. Symbiosis among cytodes
 4. Symbiosis of cytodes with unicellular organisms
 5. Symbiosis of cytodes with multicellular organisms
 6. Cytodes as the ancestral organisms

- II. Cell and its organelles
 1. Chlorophyll granules and other plastids, or trophoplasts
 - (a) Chlorophyll granules in animals [and protists]
 - (b) Chlorophyll granules in plants [and protists]
 2. Centrosome
 3. Cell nuclei
 4. Mitochondria
 5. Ergastoplasm
 6. Reticular apparatus of Golgi
 7. Nerve fibrils of N_mecs
 8. Physodes
 9. Myofibrils (contractile fibers)
 10. Blepharoplast
 11. Elaioplasts
 12. Aleurone
 13. Cytoplasm

- III. Multicellular organism
 - A. First series of examples
 - Lichens
 - Unions of higher plants
 - Unions of animals
 - Sponge-algae

 - B. Second series of examples
 - Mucous glands in aquatic ferns (Azolla) and hornworts
 - Stem glands of Gunnera
 - Protein leaf glands in plants
 - Coralloid organs of cycads

Mycorrhiza (fungus root) in various plants
Roots, tubers and flowers of orchids
Heather in general, and its root in particular
Toxic glands of *Lolium temulentum*

C. Third series of examples

Pubescence in dragonfly larvae
Glandular epithelium of midgut in ants
The racemose organ and vaginal glands of some beetles
False yolk (pseudovitellus) in aphids
Abdominal organ of cycadas
Hepatopancreas and oviduct ampullae in lice
Digestive glands of ticks
Esophageal glands of leeches
Accessory glands of the reproductive organs in Lepidoptera
Incretory glands of bedbugs
Organs of luminescence in beetles
Storage kidney of the mollusc, *Cyclostoma elegans*
Bojanus organ [renal sac] in tunicates
Organs of luminescence in [colonial] tunicates
Accessory nidamental glands and luminescent organs of cephalopods
Blood platelets (hematoblasts) in mammals

D. Other tissues and organs

IV. The Philosophy of Symbiogenesis

1. Constitution of the cell
2. Constitution of the multicellular organism
3. Mechanism of variation
4. Mechanism of heredity
5. Limits to struggle for existence and natural selection
6. Evidence for evolution
7. Reality of "intermediate links"
8. Shape of genealogical relationships
9. Specific issues in evolutionism
10. A program for biology

V. On the history of the theory of symbiogenesis

References

Commentary

Systematic Index

translated by Professor VICTOR FET, Dept Biology, Marshall University Huntington
West Virginia