

1 The Role of Cells and Cell Theory in Evolutionary Thought, ca. 1840–1872

Andrew Reynolds

CONTENTS

1.1	Introduction.....	1
1.2	Cells as Anatomical–Physiological–Developmental Units: 1838–1861.....	3
	A The Cell Theory.....	4
	B The Cell Concept.....	5
1.3	Cells as Evolutionary Units: 1844–1868.....	6
	A The Subcellular Menagerie and Explanations of the Life of the Cell.....	8
	B Spencer’s “Physiological Units” (1867).....	9
	C Darwin’s “Gemmules” and the Pangenesis Hypothesis (1868).....	10
1.4	Cells as Units of Ontogeny and Phylogeny: Recapitulation and Haeckel’s Gastraea Theory (ca. 1872).....	16
1.5	Conclusion.....	21
	References.....	21

1.1 INTRODUCTION

The modern student of biology is likely to take for granted that all living things are composed of cells; that cells are the fundamental units of anatomy, physiology, reproduction, and development; and that the evolutionary history of life on earth is characterized by a diversification and specialization of cell types, ranging from primitive and comparatively simple single-celled bacteria to the specialized tissue cells of the multicellular plants and animals—or to use the popular nineteenth century slogan: that evolution proceeds “from monad to man.”

Given the ever-expanding warehouse of facts the student of biology must assimilate in order to get up to speed with to the advancing edge of scientific research, this is quite understandable. One consequence, however, is that there is little time for learning about the history of biology, and a student might be forgiven for wondering what purpose there could be in learning about how scientists in the past got things wrong and failed to recognize what we think we know today. But for those actively engaged in research and hoping to move their field forward, an awareness of the history of