

Preface

There is an important point I want to make clear that is key within my philosophy. I am an avid—if not slightly obsessed—reader. I like to read; I wish I could know everything about everything, but unfortunately there is too much to read and so little time. As in any modern book, most of the ideas I focus on in this monograph were therefore not conceived by me for the first time. Accordingly, I profoundly believe that we should not only clearly mention, but actually pay tribute to, those authors who have influenced our ideas either because we agree with them or because by disagreeing with them we re-think and eventually change our original ideas. My viewpoint is that we should be humble and not pretend that we invented the wheel. Therefore, we should refer to the original works and—particularly for those that do not agree with our opinions—try to change their statements as little as possible so that readers can make a fair judgment about which ideas they agree with. It has occurred too often to me already, and probably to many readers of this book, to see ideas wrongly presented in works by others, either when they agreed or disagreed with them, so I want to make sure I avoid that. Accordingly, when I cite a certain work, I will often use parts of the text written by the original authors. I am aware that in such textbooks one often tends to be more general and to not cite too often directly other works. However, this is against my philosophy, and I think readers will understand, and hopefully appreciate, it as honesty. Having said that, I am fully aware that I could have read more books and papers and added more references to the ones I included in this book because my tendency would naturally be to do so. But because I intend to have the Organic Nonoptimal Constrained Evolution (ONCE) idea proposed in this book read and hopefully discussed by a wide audience, I made the difficult decision to leave out some references. I also tried to reduce the jargon. However, I am conscious that I surely was not completely successful in doing so and that at least some parts of the book will still seem very technical, some sentences too long, and some historical comments unnecessary.

My main aim for this book is to try to provide an integrative, unifying vision about evolution and to help bridge the gap between various theories and lines of thinking that were presented for a long time as if they were conflicting with each

other or were even irreconcilable. Thence my emphasis on bringing older ideas to modern discussions. Regarding the recent literature, I combine, for instance, some of the major points defended by the Extended Evolutionary Synthesis with some aspects that are, in my view, not emphasized enough in the books and papers about that synthesis. For example, the fact that the central active players in evolution are in general the organisms themselves and in particular their behavioral shifts and persistence was argued several decades ago by authors such as Baldwin and Piaget but neglected by most current researchers. Or the fact that eco-morphological mismatches are much more frequent than normally assumed. These mismatches are, for instance, related to the highly constrained character of organic evolution including the strong developmental constraints recognized in the Extended Evolutionary Synthesis. However, they are also associated with factors less emphasized in this synthesis such as the importance of behavioral persistence, which can dramatically limit the occurrence of new behavioral shifts and thus the responses to environmental changes often leading to evolutionary dead-ends and eventually to extinctions. In fact, one of the founding fathers of ethology, Niko Tinbergen (1953: 3), has emphasized how even behavior, which is the key driver of evolution according to ONCE and is often seen as highly flexible, is in fact also highly constrained: “Behavior shows wonderful adaptations, but also astonishing limitations.”

Furthermore, ONCE also stresses another crucial point: the N of “Nonoptimal” which could also be the N of “Nonstruggling” because it refers to the fact that evolution is not necessarily a process where organisms are engaged in an incessant, suffocating struggle. Under ONCE, evolution is not simply a desperate, savage competition in which only organisms that have an optimal or almost optimal “match” with the environment that they inhabit can become “winners” and, as the famous Abba song says, “take it all.” That is, within ONCE life is not unavoidably seen as a struggle 100% of the time for 100% of the organisms in 100% of their developmental stages. Life is more diverse and fascinating than that. As recently noted by Gailer and colleagues (2016), more and more studies are emphasizing the large plasticity between the so-called “optimal” morphology of a structure and the potential function of that structure, underscoring the need to appreciate apparently “maladaptive” structures in biological evolution as nevertheless effective functioning units. That is, such structures and the function they perform are “good” enough to allow the organisms displaying them to survive and reproduce, in the nonstruggling view of life defended in ONCE. As long as there is enough time and energy in this planet, there will be behavioral diversity and variation for mistakes, for trial and error, for neutral behaviors, and even for maladaptive behaviors on some occasions, i.e., for both etho-ecological and eco-morphological mismatches and for non-optimality.

Evolution in reality is generally made of mistakes, mismatches, and trial-and-error situations, which lead to new behaviors and that differentiate life and its complexity from the more deterministic existence of inanimate objects. In my opinion, the notion of a “struggle for life” has been blindly accepted for too long. It was mainly fueled by studies that were highly biased, *a priori*, to support this view,

and the adaptationist program, e.g., the “just-so stories” mentioned by Stephen Jay Gould. Unfortunately, this view of evolution has led to many wrong ideas in evolutionary biology that unfortunately lead to catastrophic events in human history and that have obstructed, and continue to obstruct, a more comprehensive view of the diversity and complexity of life. An example is extreme adaptationism, which has fortunately been challenged in modern fields such as Evo-Devo but continues to prevail in areas such as evolutionary psychology and behavioral ecology. Currently it is even rising to new levels in recent fields such as evolutionary medicine, a field I particularly admire for its good intentions, but one that has also taken some problematic paths in my opinion.

As an aside, it was mainly a coincidence that the words I choose to express my view of evolution combined to form an acronym that corresponds to the title of one of my favorite movies. In the beautiful and Oscar-winning film *Once* (2007), by director John Carney, the characters played by actors Glen Hansard and Markéta Irglová spend much of their time in both a non-optimal and non-struggling existence, mainly singing and playing deep and powerful songs and being highly constrained by their past. Ultimately, they make a behavioral choice that is surely not the one that most spectators wanted to see them making, what does not mean it was the *wrong* decision, because the diversity, complexity, randomness, and shifts of life can always surprise us. For instance, years after seeing the movie, my girlfriend and now wife, the astonishingly beautiful and intellectually complex Alejandra Hurtado de Mendoza Casaus, with whom I originally saw the film, told me that she chose the main song of the movie for our wedding ceremony. And, years later, here it is, *once* again, now as the subject of the most personal book I have written so far. Because the dedication and cover of the book is dedicated to Tots for obvious reasons related to the main subject of the book, I therefore take the occasion here to thank Alejandra, the “once” of my life.

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