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## Preface

This book, which traces back alleys and main pathways from the earliest life forms to cogitating human beings, stems mainly from an international conference held in 2004 at the Rockefeller Foundation's beautiful Bellagio Center. I believe the subject matter will fascinate those genuinely interested in what is scientifically known about the origin and the evolution of life's consciousness.

Although the fields represented here (psychology, microbiology, ecology, history of science, primatology, virology, and geology, among others) are undoubtedly interrelated, *Chimeras and Consciousness*, like science itself, cannot pretend to present a complete or exhaustive picture. Science proceeds by detailed exploration of highly specific aspects of the world. As any scientist explores his discipline, he (or, of course, she) tends to lose sight of the big picture. The short abstracts that introduce the chapters attempt, without simplification and overstatement of the science, to help orient the reader to the chapters' messages.

This book, unlike popular science "trade books," is highly concentrated. It is more like whiskey than beer. It is "the real thing": the chapters are written by real scientists and other scholars without help from journalists, professional educators, or other intermediaries. The usual intermediaries invariably simplify; with the best of intentions, they try to explain ideas that they do not understand. In my experience, it takes so much time to learn firsthand about anything that journalists at all levels of sophistication mostly have to argue from authority. None of the authors are journalists or educators.

Taken together, the chapters resemble a castle glimpsed through a fog in a foreign land. The weather clears. The scene begins to cohere into an awesome structure—reality. Consciousness has been emerging over vast stretches of time. The simpler behaviors and interrelationships of connected living entities have given rise to consciousness as known in

humanity only very recently. Nearly four thousand million years of sensitive life everywhere on planet Earth preceded us. Our tropical African talking species appeared less than a million years ago.

Like the symbiotic composite organisms from which we evolved, the chapters treat subjects that must be merged and integrated to form a more complete understanding. Alas, scientific disciplines and ignorance tend to preclude the integration that all of us would like to see. Fields of study—"subjects"—are not present in nature. Rather, nature shows a cavalier disregard for academic disciplines. Nevertheless, this book attempts, fleetingly and imperfectly, to begin to assemble a synthesis of knowledge of the connected world of conscious, sentient, beyond-human life.

The chapters that originated in academic papers presented at an obscure scientific meeting show a diversity of approaches. Together they lead to an emerging understanding of specific aspects of life's interactions in the biosphere over eons.

We should be suspicious of journalistic complete explanations and comprehensive stories, despite their allure. The former suggest too-quick connections; the latter encourages the all-too-human addiction to narrative that prematurely knows the forest without examination of its trees.

I have no illusions that scientific knowledge of reality, despite the know-it-all attitude of our species in general and scientists in particular, is ever really encyclopedic. What we do know is that painstakingly derived measurement and observation often lead us to correct our biases. As an honest scientist, I know I cannot weave a single, seamless narrative from these fascinating threads, despite my wish to do so. Science is not religion, which tends to proffer quick answers to huge questions and then spend time justifying them. Science is the meandering of observation, tentative theories, and bold hypotheses that often prove incorrect. This is its human weakness and its intellectual strength.

Nonetheless, if we were to weave a tapestry of the threads of *Chimeras and Consciousness*, it might be make a flying carpet or a great interstellar sailing ship. I invite you to venture out. Just for now, please overcome your reserve and inhibition. But bring along your sharpest critical faculties. Share with me, just for now, a symbiotic view of life and a nature-embedded perspective of mind. Let us agree that perhaps the three greatest real mysteries of nature are existence, life, and mind. This book leaves the question of existence where it belongs, in the capable hands of theologians and physicists, but it delves deeply into life and mind.

Each of us has proprioceptors—nerves that tell us about our current selves, where we are, if our toes are cold, if our throats are dry, or if we

have been deprived of sleep. Our feeling of what it's like to be alive from the inside is certainly a valid scientific sensation. But to what extent is self-awareness shared? How does living matter relate to evolving mind? What happens when we focus attentively on the chemistry and the physiology of nature's details? What do we learn?

In this book we gain valid insight into many aspects of our short lives: our senses of smell and taste, touch and balance, sensing of water and light, and the ancient histories of these senses. We learn about our relations to our home in the Earth-Moon system and its rotation around the Sun. We are surprised that social and sexual phenomena in communities thought to be so quintessentially human have immensely long histories in other forms of life. Often, appropriate study of family members, children and adults who grew up together, leads to predictions of behaviors and fates of the adults in the subsequent generation. Many "facts of life" here are at odds with prejudices and assumptions of our self-centered species in our dominant culture. Strong evidence exists for ideas about which we are unaware or only dimly conscious and which we tend to deny. We consider geology and biology unrelated fields of study, but in fact they are intimately related. We think we tell the truth to our closest kin, but in fact we routinely lie more to them than we lie to total strangers. We see viruses and bacteria as enemies to be conquered and killed, but they are parts of our own ancestry, indeed needed for our own bodies to survive. When I consider the vastness of the topics and the authenticity of the scholar-authors, I find *Chimeras and Consciousness* fascinating, and indeed remarkable for its brevity and accuracy.

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