

Preface

Twenty years ago I attended a conference about an ancient civilization from the Middle East. (By that time I had finished my doctoral studies and I was beginning to understand the diversity of one of the most complex, extinct metatherian faunas of all times: that of Yacimiento Las Flores, in central Patagonia, the levels and fauna of which can be traced to the climax of the Cenozoic greenhouse world—the early Eocene). I remember the increasing sensation of discomfort I felt while listening to the speaker, a venerable, charming old historian with a soft voice and a perfect Oxford accent. He was telling us the development of an ancient, pre-Hittite civilization on the basis of three elements: an unrecognizable piece of pottery, the hilt of a sword, and a piece of a letter written in a clay tablet. I still remember the first few words of the single phrase that historians had managed to translate from that broken tablet: “I give you this sword...” That was almost all. “I give you this sword...” The rest of the sentence was only partially intelligible and difficult to interpret. The remaining hour of that conference was an amazing series of inferences the historian had been able to rescue from those, to say the least, scarce pieces of evidence. The letter had been written by a king; it was directed to another king; it was part of a peace treaty between both the kingdoms, and the story went on and on. The history of a human culture, four thousand years ago, began to unravel before our increasingly marveled eyes.

Still, my feeling of uneasiness persisted, even well afterwards, when I came back home. Only hours later I realized what was going on in my mind. It happened that the old historian and I, a paleontologist, had much in common. To begin with, the fragmentary nature of the evidence we both have to deal with. Just a few bits of evidence, and a whole story to be told; that’s the dilemma, and the magic, of trying to understand the past. Any past.

Twenty years later, I am still trying to complete my study of the Las Flores metatherian assemblage (fortunately, a paper on this topic will soon be completed). My bits of evidence for this task are around 500 isolated molars, probably belonging to three dozen species. From time to time, while I am looking at the

specimens under the stereomicroscope, I find myself thinking the ominous words: “I give you this sword...”

By the end of the Mesozoic Era, probably during late Campanian or Maastrichtian times (some 75–66 million years ago) a metatherian mammal stepped into the South American continent for the very first time. Possibly, it was not very different from the small opossum shown in Fig. 1.1 of this book. Most probably it came from North America, taking advantage of a land bridge opportunity provided by the oriental margin of the Caribbean Plate, in its constant drift eastwards since the Late Cretaceous. It is not clear whether this single arrival provided the genetic source for the whole radiation of metatherian mammals in South America during the Cenozoic. It has been argued that not one but several lineages were part of the migratory event, possibly in more than one dispersal episode. A few million years later, most of the basic lineages of South American metatherians were already in place, developing some of the most extraordinary adaptive types ever evolved in this continent. Also possibly, a few million years later, the first lineage (lineages?) of South American marsupials arrived at Australia via the Antarctic continent. During the Cenozoic, the once cosmopolitan metatherians would be progressively restricted to the Southern Hemisphere, until the arrival in North America of the Didelphidae by the end of this era.

This short book is a summary of what we know about the evolution of South American metatherians during Cenozoic times. More than a detailed taxonomic typology, it offers a review of the different contexts that framed their evolution in this continent. After the introductory notes (Chap. 1), we examine the biology and natural history of living marsupials as a hint to understanding their past (Chap. 2). We then comment on different aspects of Cenozoic tectonics, climates, and biotas that composed the successive scenarios of metatherian evolution, radiations, dispersals, and extinctions (Chaps. 3 and 4). A brief characterization of each major lineage of South American metatherians is provided (Chap. 5). We also make a number of inferences as to the paleobiology of these lineages during Paleogene times, the most significant period in South American metatherian history (Chap. 6). Finally, we summarize the most significant milestones in the evolution of South American metatherians.

We offer you this book (“I give you this sword...”) in the understanding that several of the hypotheses that have been put forth here probably will be outdated in the next few years. Much research is currently being carried out on the phylogeny, taxonomy, anatomy, macroevolution, and paleobiology of extinct South American metatherians. Exciting new developments are being made in many topics, and a new generation of researchers is taking the lead in each one of them. Hopefully, a more detailed panorama on South American, Cenozoic metatherian evolution will be completed before the end of this decade. We look forward to it.

A Brief History of South American Metatherians
Evolutionary Contexts and Intercontinental Dispersals
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