

PALAEONTOLOGY IN THE SOUTHERN WORLD: BENCHMARKS IN THE HISTORY OF DISCOVERY AND RESEARCH

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The presentation explores the early research and exploration of the southern continents with special reference to South America and Antarctica. The pioneer palaeontological knowledge in South America started in the XVIth century with the military and priests that came to these lands from the Kingdom of Spain. The earliest records are mostly related to findings of huge bones that were linked with the presence of giant humans that had inhabited the region before the Deluge. Besides, the European navigators that travelled along the southern oceans also provided early references to fossil vertebrate and invertebrate remains. By the XVIIIth the amount of references of fossil findings all along the west of South America and also in the Pampean region of what is now Argentina increased exponentially, while the first report of fossils of what is now Brazil is by the end of the XVIIIth century with the testimony of the exceptionally preserved fossil fishes from Ceará. It is worth noting here that this description includes interesting taphonomic inferences. The next stage in the history of discovery and research is that related to several voyages of European naturalists in the XIXth century. The three most important expeditions were performed by Alexander von Humboldt, Alcide d'Orbigny and Charles Darwin. Humboldt in the company of Aimé Bonpland toured extensively northwestern South America, collecting fossils that were later described by great naturalists of the stature of George Cuvier and Leopold von Busch. Alcide d'Orbigny travelled for 8 years (1826-1834) in almost exactly the region of South America that was not covered by Humboldt, conducting major studies in what is now Bolivia, the Paraná River banks and the regions bordering the oceanic coasts of southern South America. The results of these studies were published in the *Voyage dans l'Amérique méridionale* with a volume devoted to the paleontological findings. Charles Darwin on board of the Beagle stayed almost five years investigating geology and palaeontology and making natural history collections all around the world, but mostly in the southern hemisphere. In fact, Darwin spent most of this time exploring on land while the Beagle surveyed and charted coasts. He kept careful notes of his observations and his theoretical speculations, that enabled him when he went back home, to work in his famous theory on the origin of species by natural selection. It is important to mention here his findings of fossil mammals in the coasts of Argentina and his geological and palaeontological observations across the Main Andes of Argentina and Chile which are as, or even more important, than his research in the Galápagos Islands. In the late XIXth century, Florentino Ameghino, an Argentine *savant*, devoted much of his life to the study of Cenozoic fossil mammals with the help and expertise of his brother Carlos who made more than a dozen field trips to Patagonia. George Gaylord Simpson, eminent palaeontologist and one of the founders of the Synthetic Theory of Evolution said "*The partnership of the Ameghino brothers was an outstanding example of teamwork, and their achievement was one of the most remarkable in scientific history*". The survey of the southernmost region of the world during the second expedition of James Cook (1772-1775) in search for the *Terra Australis Incognita*, demonstrated that the Antarctic land was much smaller than previously thought and mostly covered by ice. This fact set the stage for the XIXth and XXth century explorations of Antarctica. The expedition of Otto Nordenskjöld around Antarctic Peninsula is relevant from the palaeontological point of view, specially taking into account the paleoclimatic inferences that were postulated from the study of the Mesozoic paleofloras of Hope Bay, showing that Antarctica has been a much warmer place in the past. The fossils recovered many months



after the ill fated end of Robert Scott second expedition to the South Pole included representatives of *Glossopteris*, a seed fern only known at that time from India, Australia and South Africa. The studies of Juan Keidel in Argentina together with those of Alexander Du Toit in South Africa regarding many geological similarities between Late Paleozoic rocks of both regions combined with the geographic distribution of *Glossopteris* and *Mesosaurus*, a small aquatic reptile, were key elements in Alfred Wegener theory of continental drift and also in the existence of Gondwana. His hypothesis was controversial and not accepted until much later when other discoveries provided support for continental drift which is a substantial basis for today's model of plate tectonics. Some revolutionary scientific theories may take many years to be accepted among scientists. This is certainly true of plate tectonics, one of the most important geological theories of all times and of evolution of species by natural selection, one of the most important theories in modern biology. Finally I would like to end this presentation stressing that both theories got strong inputs from early palaeontological discoveries in the southern world, an area that may still hold some hidden treasures for the palaeontology of the future.

