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JOSÉ FERNANDO BONAPARTE (1928 –2020)

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PLANT PREDATION FROM PALEOCENE NEOTROPICAL RAINFORESTS

Plant-insect associations in leaf fossils from the Bogotá Formation, central Colombia, indicate much more intense herbivory than elsewhere.

FIRST FOSSIL RECORD OF SAWSHARKS FROM CHILE

The genus *Pliotrema* is described from the Miocene–Pliocene Bahía Inglesa Formation, Atacama region.

NEW ERYTHROSUCHID ARCHOSAURIFORM FROM INDIA

The new genus and species *Bharitalasuchus tapani* is described from the Triassic Yerrapalli Formation.

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José Fernando Bonaparte was the most important Argentinian vertebrate paleontologist of the 20th century. He was the "Ameghino of the Mesozoic", or in fact, he had the skills of Florentino for research and those of Carlos Ameghino for discovering fossils. Bonaparte was multifaceted, bringing together the abilities of a mechanic at repairing vehicles during expeditions, the dexterity of a technician to prepare the fossils he discovered, the skills of a blacksmith to mount skeletons in exhibition halls, and the imagination of an engineer to build pulley systems to haul and lift heavy jackets with fossils through badlands. He also was multifaceted in the research topics he mastered: cranial morphology of Triassic cynodonts, modifications in the hindlimb of diverse early archosaurs, morphology of the tooth cusps in Mesozoic mammals, rostrum structure of Cretaceous pterosaurs, etc., etc. He discovered completely new faunas of vertebrates from the Triassic, Jurassic, and Cretaceous, and laid the foundations for the biostratigraphic chart of South American Mesozoic vertebrates. He had an enormous capacity to understand the taxonomic diversity and phylogenetic relationships of the first Cretaceous mammals to be discovered in South America, which represented a completely unknown chapter of the Argentinian fossil record. It was also admirable his capacity to integrate the anatomical and phylogenetic information of a "stampede" of protomammals he discovered in the Santa Maria Triassic beds, west of Porto Alegre, opening the doors for numerous young researchers from Brazil and Argentina.

José F. Bonaparte was born in Rosario on June 14th, 1928 and was raised in Mercedes, where his passion for paleontology began. In 1947, at the age of 19, he founded along with other "*paleolocos*" (as he liked to say) the Museo Popular "Carlos Ameghino". In 1958 he was invited by the great evolutionary biologist Osvaldo A. Reig to form part of a new team of vertebrate paleontology at the Instituto "Miguel Lillo" in Tucumán, to which he was incorporated as a technician in 1959. At the beginning he was in charge of organizing the expeditions to Ischigualasto and to prepare, along with the talented technician Galileo Scaglia, the fossils they collected in their trips to Triassic outcrops. Meanwhile, Bonaparte took classes and courses to increase his knowledge on anatomy, evolution, and geology with different professors at the Universidad Nacional de Tucumán. After seeing Bonaparte's advances and enthusiasm, Reig proposed him to choose between continuing as a fossil preparator or shifting entirely to scientific research. With these words Reig stimulated Bonaparte to adventure in the study of fossils they were discovering in San Juan, taking a direction he later consolidated when Reig left his position in Tucumán in 1960. From that moment, Bonaparte had a protagonist role in the discovery of new Triassic faunas, obtaining grants from CONICET and the Fundación "Miguel Lillo" that allowed him to start an important exploration plan in diverse localities in the Argentinian northwestern region. His findings and publications linked him to Alfred S. Romer, a famous anatomist and paleontologist from Harvard University, who supported Bonaparte for obtaining a Guggenheim scholarship to continue his studies in institutions of USA and Europe. At Harvard, he expanded his knowledge in Vertebrate Paleontology with Ernst Mayr, Alfred S. Romer, Bryan Patterson, and Zofía Kielan-Jaworowska.

The first half of the 1960s represented a time not only of new findings, but also of consolidation of research groups that included outstanding scientists like Osvaldo Reig, Sergio Archangelsky, Rodolfo Casamiquela, Rafael Herbst, and Rosendo Pascual. They were the founders of modern Paleontology in Argentina, and one way or the other, those that work nowadays in Paleontology in Argentina are disciples of this generation of great scientists.

The team that Bonaparte assembled in Tucumán included people with manual dexterity and physical stamina. Together with Martin Vince, Tomás Fasola, and Juan Leal, among others, Bonaparte collected tons of rocks from the Los Colorados Formation (Upper Triassic, La Rioja) and later from the Cañadón Asfalto Formation (Middle Jurassic, Chubut). By 1963, and thanks to the support of Rosendo Pascual, Bonaparte obtained a research position in CONICET ("Carrera de Investigador Científico"). He had started as an amateur paleontologist that in 1958 was willing to work on anything available ("*venía bien trabajar en cualquier cosa*" in his own words). Eventually, in 1974 the Universidad Nacional de Tucumán granted him the title *Doctor Honoris Causa*.

Towards the end of the 1970s Bonaparte had accepted in his research group young students, such as Jaime Powell (his first student) and Andrea Arcucci, both graduated from the Universidad Nacional de Tucumán. In 1978 Bonaparte left the Instituto "Miguel Lillo" to settle in Buenos Aires where he became the chairman of the Vertebrate Paleontology section of the Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" (MACN). In few months Bonaparte transformed a gloomy and stagnant section into dynamic offices and labs in which enthusiastic collaborators participated in the preparation of expeditions, preparation of wonderful discoveries from Patagonia, and PhD students began to make progress with their own studies. This activity significantly increased the collections of vertebrate fossils and mounted skeletons of dinosaurs were shown—for the first time in the history of MACN—in the Paleontology exhibit hall.

During his term in Buenos Aires Bonaparte formed young paleontologists that became prominent figures in the international paleontological community, such as Luis Chiappe, Guillermo Rougier, Leonardo Salgado, Jorge Calvo, and Rodolfo Coria. He also took effort and time to form highly skilled technicians such as Pablo Puerta and Marcelo Isasi. By the mid 1980s the Vertebrate Paleontology section was honored to receive international researchers such as George Gaylord Simpson, Sun Ai Lin, Zofía Kielan-Jaworowska, John Fleagle, Paul Sereno, and David Krause, among many others. It was, undoubtedly, the "golden age" of the Vertebrate Paleontology section at the museum of Buenos Aires.

The academic shine of this place was eclipsed on a daily basis by Bonaparte's impolite behavior towards students and collaborators. At first, his sudden anger outbursts generated amusement and humorous comments among the young collaborators. However, with time and as we became more mature, his attitude led to bitter and useless discussions with our boss. Bonaparte was a truly genius of Paleontology, an "all-terrain tractor" and none of us could have overshadowed his figure, but I think that deep down in his personality he was afraid his students will relegate him from his leading role (something that, of course, never actually happened).

However, his rude behavior was intercalated with highly positive lessons that set the path of many of his students. I specifically refer to the fieldwork experiences, which occupied a central role in the life of Bonaparte and that were the source of his most important discoveries. In many cases great paleontological discoveries have a dose of luck, but if this is accompanied by frequent prospecting, effort, and determination, the chances of new findings increase remarkably. I remember one expedition to the Cretaceous site Los Alamitos, in the Río Negro Province, in which we were looking for remains of tiny mammal teeth. Our camp was at the Otero family house, and every morning a couple dozen youngster left towards the fossil site. We had to drive along a faintly marked track that was in bad conditions, which required us to remove large rocks from the road and cover the holes with picks, shovels, and hands. Bonaparte happily said: *"Ves pibe…¡así se descubren los mamíferos mesozoicos!"* [You see boy… this is how you discover Mesozoic mammals!]. To discover new fossils, it is crucial to go out and look for them in the field, investing a considerable amount of time in duties that have nothing to do with the academic life (road construction work, for instance), but that allow us to reach valuable fossil sites.

Bonaparte acted as a great teacher when he selected topics for doctoral students, which according to his own words should have "trascendencia internacional" [international transcendence], and invited students to participate as coauthors in papers that were pioneers for understanding the anatomy and evolution of diverse dinosaurs, birds, and mammals.

It must also be noted his talent for science communication, having participated in the 1960s in several documentary films for the Universidad Nacional de Tucumán, by the film maker Jorge Prelorán. He also captivated readers in his books *"El Mesozoico de América del Sur y sus tetrápodos"* (1978), *"Dinosaurios de América del Sur"* (1996), *"El Triásico de San Juan y La Rioja, Argentina y sus dinosaurios"* (1997), and *"Protomamíferos y mamíferos mesozoicos de América del Sur"* (2010), among others in which photographs of landscapes, fieldwork, and mounted skeletons have a great historical value.

Bonaparte was the discoverer, preparator, and descriptor of a long list of Mesozoic vertebrates, including the Triassic archosaurs *Fasolasuchus* and *Neoaetosauroides*, the Triassic crocodylomorphs *Pseudohesperosuchus* and *Hemiprotosuchus* from La Rioja and *Comahuesuchus* from the Cretaceous of Neuquén, the dinosaurs *Riojasaurus, Piatnitzkysaurus, Patagosaurus, Carnotaurus, Amargasaurus, Argentinosaurus* and *Noasaurus* (among many others), the Triassic cynodonts *Cynognathus minor*, *Pascualgnathus*, *Andescynodon* and *Cromptodon* from western Argentina, and *Riograndia, Prozostrodon, Brasilitherium* and *Therioherpeton* from southern Brazil, the Cretaceous mammals from Patagonia *Gondwanatherium, Mesungulatum, Groebertherium*, and *Peligrotherium* from the Paleocene and the Cretaceous birds *Patagopteryx* and *Iberomesornis*. A long list of taxa that makes Bonaparte one of the researchers with the largest number of named species in the history of Vertebrate Paleontology.

These findings allowed him to develop novel hypotheses about the faunal replacements in the Triassic, the origin of dinosaurs from forms similar to *Lagosuchus*, the isolated evolution of diverse vertebrate assemblages of the Mesozoic from Gondwana respect to their Laurasian relatives, the diphyletic origin of mammals among disparate groups of Permo-Triassic cynodonts, and many other topics.

In 2008, he received the Romer-Simpson medal, which constitutes the maximum honor awarded by the Society of Vertebrate Paleontology in the USA to prominent researchers. He spent his later years in the city of Mercedes, working in topics related to the origin of mammals, describing skulls and teeth of different 'proto-mammals' from the Triassic of Brazil.

Bonaparte passed away on February 18th, 2020 leaving a permanent legacy in South American Paleontology.

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