

Argentina in Antarctica

Argentina has had varied military and scientific presence in the Antarctic continent. The Operation 90 (1965) and the discovery of *Antarctopelta oliveroi* (1986) are proof of it.

Operation 90: First Argentine land expedition to the South Pole.

In 1965, Argentine army men decided to reach for the first time the South Pole by land from Belgrano Base, located at latitude 77° 46' South and longitude 38° 11' West on the Filchner barrier (430.000 km² of ice, south from Weddell Sea). This expedition to the South Pole was denominated Operation 90 after the latitude 90° that indicated the geographic South Pole. The Pole's conquest was an old desire of general Hernán Pujato, pioneer in the activities of the Army in the Sixth Continent.

In March, at the beginning of the long polar night, a forward patrol departed to raise a support construction at latitude 81° 04' South and longitude -40° 36' West, on the first foothills of the polar plateau. These facilities were denominated Sub-Lieutenant Sobral Advanced Scientific Base (founded on April 2nd, 1965).

During the following months they prepared garments, equipments and specially vehicles: six snowcat tractors capable of transporting personnel, instruments and supplies.

On October 26 the expedition departed under Colonel Jorge Edgard Leal's command, preceded by a polar dog sleigh patrol. On November 4 the men arrived at the said Sub-Lieutenant Sobral Base, where temperature was 33° C below zero. During the journey the sleighs had been damaged, forcing the group to stay several days for maintenance.

However, difficulties had barely started: from that point on big cracks, sometimes hidden under very fragile snow bridges, would become invisible traps for the snowcats, in which only some supply sleighs would be lost. Besides, East-West orientation of the sastrugis (big tracks the wind digs on the ice surface) would force to surpass them head-on, making the march dangerously slow. At latitude 83° South a two-day pause was needed to repair skates and strengthen the structures of both sleighs. It was the most difficult moment of the trip and men referred to that halt as "desolation camp".

However, in spite of the weariness, the proximity to the Pole provided a special energy, and through the rigid ocean of sastrugis, with walls as tall as the snowcats, the expeditionaries continued the tiresome march, until on December 10 - after 45 days of walking, and making the last leg without sleeping for 28 hours - they set foot on the hardened snow of the Pole, metres from the Amundsen-Scott American base.

The last day of the year, December 31 1965, after covering approximately 2.900 km on the ice cap in 66 days, climbing heights over 3.000 metres with temperatures lower than -40°, the group arrived at Belgrano Base.

The expedition arrival to the Antarctic South Pole was considered a national feat and earned the praise of the President of the Republic, Dr. Arturo U. Illia.

The following members of Argentine Army were part of this expedition: Colonel Jorge E. Leal, Captain Gustavo A. Giró Tapper, Principal Sub-Officer Ricardo B. Ceppi, Adjutant Sergeants Alfredo F. Pérez and Julio C. Ortiz, First Sergeants Roberto H. Carrión, Adolfo O. Moreno and Jorge R. Rodríguez, Corporal Ramón O. Alfonzo.

The operation conducted observations and kept records on the following scientific disciplines: meteorology, glaciology, topography, astronomic navigation, Earth's magnetic field (magnetic declination and vertical component), gravimetry and geology (collecting of petrographic samples).

Argentine Antarctic Institute - National Direction of the Antarctic

The Argentine Antarctic Institute was created by Decree of the National Executive Power Nº 7.338 of April 17, 1951. Its founder and first director was the then Colonel Hernán Pujato. The fundamentals of its creation established the need for a specialized body to guide, control, direct and execute scientific and technical investigations and studies related to that region.

1965-2015. 50 years from the foundation of Sub-Lieutenant Sobral Advanced Scientific Base.

On April 2nd 1965 it was inaugurated, on latitude 81° 04' 45" South and longitude 40° 39' 05" West, over the south part of Filchner ice barrier, Sub-Lieutenant Sobral Advanced Scientific Base, 420 km south current General Belgrano Base. It was founded by a staff of said base, as a staging post on the route to the South Pole. 40 tons were transported by land in three months of continuous labour, which required five trips with tractors on a difficult zone of the Antarctic Continent. The base was trained to make observations and keep records on aurora australis, meteorology, snow, topographic and astronomical surveys.

Antarctopelta oliveroi

In 1986, an expedition from Argentine Antarctic Institute to James Ross island found remains of a dinosaur species yet unknown. It is a genus of ankylosaurian dinosaur represented by a single species, *oliveroi*, which lived at the end of the Cretacic period (about 75 million years ago) in the Campanian, nowadays Antarctica.

The Earth's climate was then warmer, and even the Antarctica was already in the South Pole it was probable that it would have been without ice at least part of the year, partially covered with coniferous forests and deciduous trees with high seasonality, a similar environment to southern Patagonian Andes nowadays.

The sediments where the remains were found belong to the Santa Marta Formation (along Kirpatrick formation, one of the only two geological formations in Antarctica where there are dinosaur remains).

Teeth, parts of the lower jaw, fragments of a skull, vertebrae, limb and toe bones, posterior part of a tail and hip and numerous pieces of the shield of the *Antarctopelta* were found. The material was collected in a 6 m² area during several seasons, and all of it is considered to be part of a single individual.

Among ankylosaurs the *Antarctopelta* was medium sized, about 4 mts long. It was a solid herbivorous, quadruped, protected by armor plates inserted in the skin and with small but well ossified skull.

From the found vertebrae, belonging to several parts of the tail, ossified tendons at the superior and inferior sides of that organ can be assumed. In ankylosaurians this tendons helped to keep straight the end of the tail, topped with a big bonny club. It is probable for the *Antarctopelta* to have had a similar club.

These fossils are the only ones known of this ankylosaurian, which despite being the first dinosaur discovered in Antarctica was the second one to be formally named, next to the *Cryolophosaurus* in 1994. *Antarctopelta* was named in 2006 by Argentine paleontologists Salgado and Gasparini. Its name refers to the Antarctic continent and its armoured nature (pelta means "shield" in Greek). The only named specie (*oliveroi*) honours Argentine geologist Eduardo Olivero, its discoverer.

The *Antarctopelta oliveroi*'s remains are in La Plata Natural Sciences Museum, ceded by the Antarctic National Management for its care and exposure.

This museum, built in 1884, is one of the oldest natural history museums in South America. The collection of the Vertebrates Paleontological Division (DPV) was created in 1877, when future museum director, Dr. Francisco Pascasio Moreno, donated 15.000 pieces. Beside this original

bone, several argentine and Antarctic dinosaur materials has been collected, acquired during more than a century and kept in the collection of the DVP. These contain thirteen types of materials and other important specimens of dinosaur, including ornithischians (ornithopods, ankylosaurs), saurischians (theropod, saurophodomorpha) and three ichnospecies.

NOTE: As military ranks change from one country to another, in many cases with no official equivalence between them, argentine navy ranks were translated according to the meaning of the words themselves without keeping any equivalence with other armies in the process. The only exception is "Sub-Lieutenant Sobral", after whom the scientific base was named, in which case the official english translation was respected.