

The beds with dinosaurs***on the southern coast of the Río Negro, in front of General Roca***^{1,2}

BY THE DR. RICARDO WICHMANN.

translated by Jeffrey A. Wilson
University of Michigan, May 2002

If one travels by train from Bahía Blanca to Neuquén, the naturalist traveler will notice on the cliffs, amongst the very monotonous coloration, the colored beds near the Río Negro station that appear on the southern side of the river. As seen here, the cliff is elevated in three principal terraces in the form of steps. The upper terrace, which forms the border of the cliff, consists of nearly 90 meters of sandstones and bland, tuffaceous loam of yellow white color that are without fossils, until now have been found only petrified wood aggregated in the form of clusters or stalactites. WINDHAUSEN³ refers them to his “beds of Jagüel”, which are put at the base of the rocky floor, based on his observations in the region situated more to the northeast. But its petrographic aspect has a strong resemblance to the beds of Chichinales, on the north side of the Río Negro, and with the Patagonian molasa (WILCKENS).

From the foot of the cliff the extends with great thickness the plain of the second terrace, which is covered by a bed of rollings and sand. It terminates in a sharp slope that permits visualization of the strata that compose it. The cliff has a height of nearly 40 m. and is divided by erosion into a labyrinth of canyons and gorges. Many times the erosion has deeply grooved these beds in a fashion that leaves only isolated cones, walls, towers, and like forms. We see here the typical formation of “Bad-Lands”. We find the dinosaur beds that make the landscape very picturesque, both for their forms and for the vibrant colors of their strata. They are mostly composed of loams and clays with intercalated sandstones.

In the best section, I have observed the following beds, from top to bottom:

6-8 m. : fine-grained colored sandstone, in some parts hard and calcareous, stratified in thick banks above and more thin banks below, with *Ripple marks* and encrusting structure

1 m. : loams and sandstones of violet and white color.

0.25 m. : yellow sandy clay, containing internal molds of bivalves and gastropods, mostly poorly preserved.

¹ Original reference: Wichmann, R. 1916. Las capas con dinosaurios en la costa sur del Río Negro, frente a General Roca. Physis 11:258-262.

² The trip that motivated this article was done in 1912 by the order of the director General of Mines.

³ *Contribución al conocimiento geológico de los territorios de Río Negro y Neuquén. Anales del Min. de Agricultura. Sección geología, etc.*, volume 10, number 1, 1914.

2 m. : very muddy clear gray sandstone with salts.

1 m. : laminated clays, very yellow, filled with innumerable molds of saltwater bivalves (*Corbicula*), containing salts and dissolving easily. In some parts sandy and passing into violet clays above. Many instances of friction marks (*Druckharnische*) can be observed.

1.50-2.00 m. : bland, dirty-gray muddy sandstone.

4.50 m. : calcareous colored sandstone.

20.00 m. : alternating loam, clayey loam, clays, and sandstones of white and dark violet color, little resistant, that can easily be broken into a fine powder in a way that allows excavation of up to 1 m. before arriving at hard rock. The beds are very rich in gypsum, which exists in large plates and compact, fibrous aggregates. Moreover, one sees in the little grooves of the slopes, washed and reunited by rains, large masses of spherical, kidney-shaped, and stalactite-shaped opal that is colored white, yellow, green, red, and principally blue.

In the upper part of the last complex, I found a large part of the skeleton of a dinosaur that consists of a part of the skull, the limbs, various vertebrae, ribs, and other bones. Some distance from these remains, I found in other places many loose bones. Based on the vertebrae, this animal pertains to the genus *Titanosaurus*, which Lydekker has created from bones found at the confluence of the Río Negro and Neuquén¹. The preservation is variable, most of the bones have a hard, calcareous fossilization, some others are silicified, and others are clayey-calcareous and impregnated with soluble salts such that without proper preparation they are destroyed very rapidly. The remains that I could extract from the rock show no sign of long transport, as verified by the mandible with well preserved, slender teeth. From this, the opinion of WINDHAUSEN¹ that the dinosaurs of this area were allochthonous is not very likely.

The color of these bones is bluish, gray-white, and black; other that were on the surface of the multicolored loams are colored red.

More to the east of this place, a cliff section is observed that presents, downward from the top:

a) 3 m. : stratified bland red sandstone;

b) 1 m. : loams and loamy sandstones that are violet and white;

c) 2.00 m. : red sandstone;

d) 0.30 m. : dark violet loam;

e) 2.00 m. : red sandstone;

f) 4.00 m. : loam and loamy sandstones that are white, red, and dark violet, of easy disaggregation, forming a gentle slope below the red sandstone;

g) 0.50 m. : white lime cliff, hard, with innumerable bivalve molds (*Corbicula*);

¹ *Anales del Museo La Plata. Paleontología Argentina, II.*

h) violet loam, somewhat sandy.

Bed *f* contains in its upper 30 centimeters innumerable well preserved fossils that, because they are preserved in amorphous silica, can easily be separated by dissolving the loam in dilute hydrochloric acid. There are different species of *Corbicula* here, a small *Hydrobia* (see Figures 1 and 2) and other large gastropods; additionally there is a great quantity of fructiferous charophytes and ostracods. The ostracods pertain to different, as yet undetermined genera (Figs. 3-5); neither is it possible to tell whether the charophytes pertain to the genera *Chara* or *Nitella* because they lack the “crown”.

The charophyte fossils are rare and poorly known thus far. Earlier discoveries come from the “Muschelkalk” of Moscow and the Lower Cretaceous (Wealden) of Neufchâtel in Switzerland. This genus has undergone little change since its first appearance to date, as can be seen from the sporangia coming from the dinosaur beds (Figs. 6-9) and the arroyo deposits of the post-pampean of Bahía Blanca (Figs. 10, 11), at least as the question pertains to fruiting bodies, other remains are not found here.

Figures 7, 9, and 11 show the sporangium viewed from the point of insertion of the “crown”, and 6, 8, and 10 from the side of its spirals.

Despite their preference for living in fresh water, the charophytes often grow in salt water, so that we have here in this complex group of beds a salt water flora and fauna living at shallow depth. WINDHAUSEN² has correlated these strata to the beginning of the “Rocan” transgression.

In the “Purbeckkalke” (lowest Cretaceous of northwest Germany)³, in the “Middle Purbeck” of England, and in the upper “Couches saumâtres” and “Couches nymphéenes” of Jura⁴ (beds limiting the Jurassic to the Cretaceous) can be found a very similar grouping of fossils. Also here are fruitings of a charophyte (*Chara Jaccardi* Heer), which cannot be compared to the species of General Roca because of lack of literature; also ostracods (*Cypris purbeckensis*, *Cypridea punctata*, etc.), *Hydrobia*, *Bythinia*, *Cyrena*, and *Corbicula*.

¹ *Einige Ergebnisse zweier Reisen in den Territorien Río Negro und Neuquén. Neues Jahrbuch für Mineralogie, etc.*, Beilage Band XXXVIII.

² *Loc. cit.*

³ KOERT : *Grenzschichten zwischen Jura und Kreide*. Göttingen. 1898.

⁴ MAILLARD : *Monographie des invertébrés du Purbeckien dans le Jura*. 1884.