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The expedition of the Alsatian naturalist Guillaume Philippe Schimper to Sierra Nevada in 1847¹

I. INTRODUCTION

In the south of Granada, between the valleys of Genil and Guadalfeo, stands the ancient Sol Solarium of the Romans, the Arab Sulayr, later named as Sierra Solera and Sierra de la Helada and now known as the Sierra Nevada, with three of the greatest heights of the Iberian Peninsula: Mulhacén, Veleta and Alcazaba. The most outstanding hill, the Mulhacén, reaches 3,479 meters above the sea level. The approximate surface of the mountainous massif is about 2,000 square kilometres and extends from East to West for about ninety kilometres. Twenty-nine summits of Sierra Nevada exceed three thousand meters in altitude. Sierra Nevada is the third highest mountain system in Europe, after Mount Elbrus, in the Caucasus, and the Alps. Some travellers have named Granada the Andalusian Switzerland and Sierra Nevada the Andalusian Alps, establishing a clear relationship between the Central European and Penibetic mountain ranges' most outstanding peaks: the Montblanc and the Mulhacén.

The northern slope of the Sierra Nevada, which is the city of Granada, is the steepest, with huge pits such as the Alcazaba, Mulhacén or Corral del Veleta. The south slope, softer, oriented towards the sun and very close to the Mediterranean Sea, allows the rise of small population centres to nearly two thousand meters. On either side, the slopes are dotted with lagoons of glacial origin:

the Yeguas, Larga, Mulhacén, Caldera, Rio Seco, Bacares, among others.

The high altitude reached by the Sierra Nevada and its geographical location within a macro climatic area of Mediterranean influence, make its temperature difference oscillate between -20 and +30 degrees Celsius. This has created a very peculiar botanical landscape in which within a straight line distance of about ten kilometres, the flora of the Arctic tundra coexists in the highest peaks with tropical crops. The summits have a desert appearance, but for the botanist they constitute the paradise of the endemic species, plants that do not exist anywhere else in the world and of which there are almost one hundred in the Sierra Nevada, some unfortunately in process of extinction.

This vegetation constitutes the nutritional base of a specific race of mountain goat that after the extinction of wolves and lynxes represents the most important animal population of the Sierra. This, without counting the abundant species of insects, many of them also endemic, as happens with the *apollo nevadensis*, an exclusive butterfly of Sierra Nevada that would fulfill the ambitions of the best collector.

The presence of travellers from all parts of Europe in Sierra Nevada has historically been very abundant since the French botanist Joseph Quer in 1762, Irish geographer Guillermo Bowles in 1775, the Catalan botanist Antonio Palau in 1778 and the German mineralogist Guillermo Thalacker in 1801, who visited the penibetic massif between the late eighteenth century or the early nineteenth. Such interest derives from the uniqueness of a mountain

¹ Traducción: Luis Lozano Acosta.

that has made botanists, zoologists, geologists, geographers, painters, writers or simply mountaineers, contemplate it as an inescapable object of their research and an essential scientific, romantic and sporting destination of their trips through the south of Spain.

II. ALSATIANS IN SIERRA NEVADA

In the summer of 1847 a group of Alsatians arrived in Granada with the intention of searching in Sierra Nevada for a new species of mountain goat whose existence they had heard, as will be seen later.

The new expedition was formed by the textile industrialist Daniel Dollfus-Ausset, lover of the mountains (also its financier); his son Gustavo, with 18 years old; his usual guide in alpine expeditions, Hans Jaun, who was an experienced Swiss hunter; the biologist Guillaume Philippe Schimper, then curator of the Strasbourg Museum and finally, "at least for some time", mainly during his stay in Sierra Nevada, *an artiste Français*. This was, almost certainly, Couturier, a French artist and photographer based at that time in the city of the Alhambra, of which we only know his last name, but who accompanied and photographed Alexander Dumas on his trip to Granada in 1846, who gives us news about him. He surely realized the first daguerreotype ever done in Sierra Nevada, conserved to this day, although in very bad state, in the Library of the University and of the Industrial Society of Mulhouse, to which an independent work has been considered a milestone in the history of photography in Granada and mountain photography in Europe.

The real inspirer of the expedition was Schimper, someone who is practically without any studying in relationship with Sierra Nevada and has hardly ever been linked to Spain. However, one of the subspecies of ibex in southern Spain bears his name. Also, his theories about glaciers were known, used and criticized by later glaciologists such as Richard von Drasche and Hugo Obermaier. Therefore, Schimper was a well-known figure with a long historical projection. We have not tried, however, to carry out this pending study on it, but only to place its presence in Spain within the context of an expedition hitherto unknown and assess the true importance of its figure.

Guillaume Philippe Schimper was born in 1808 in Dossenheim, canton of Petite-Pierre, in Alsace, and was the son of a Protestant pastor, an activity for which he himself began to prepare in Strasbourg, where he obtained a bachelor's degree in theology in 1833; However,

his scientific interest led him to abandon ecclesiastical studies in sake of his naturalist vocation, whereas in very broad ways, he initially oriented towards the study of mosses.

In 1835 he was appointed organizer of the Museum of Natural History of Strasbourg and in 1839, curator of the natural history collections of the Library of the Faculty of Sciences. From there, the creation, growth and conservation of the Natural History Museum of Strasbourg became the main task of his life. In 1848 he obtained a doctorate in science with a thesis on mosses and in 1862 the chair of geology and mineralogy at the University of Strasbourg.

In 1871 the Franco Prussian War passed Alsace to German sovereignty, the Faculty of Science was dissolved and its professors dispersed. The French government then offered him the chair of palaeontology at the Botanical Garden of Paris, with the promise of occupying the first available place in the geology or botany sections of the Academy of Sciences, but he chose to remain in Strasbourg, now under German jurisdiction, to fight for the conservation and maintenance of the museum that, as his friend Charles Grad wrote, was "the best work of his life". And as soon as the new Alsace-Lorraine government restored the University, sensitive to the importance of having that great researcher, he asked him to join his chair.

It is in his role as organizer of the Natural History Museum, between 1835 and 1848, when Schimper had to make numerous trips and in which his expedition to Sierra Nevada, the highest in the mountains of the Iberian Peninsula, occurred in 1847.

Indeed, at the beginning of that year's summer, when he was in the company of his friend the Alsatian industrialist Dollfus-Ausset in southern France, he witnessed inside the Avignon Museum some wild goat horns of a different species from those he knew of the Pyrenees, the Alps and any other mountain or museum in Europe.

He then connected with the curator of the Royal Museum of Natural History of Madrid, Mariano de la Paz Graells, and he informed him that it was a type of native goat possibly from Sierra Nevada, perhaps found next to Mulhacén peaks and Veleta, where they could also appreciate the existence of ancient glacier remains. There were enough arguments for Schimper and Dollfus-Ausset to postpone other projects, embark in Marseille, disembark in Malaga, travel to Granada and go to Sierra Nevada through Güéjar Sierra, Cortijo de las Víboras and finally San Jerónimo, where they stayed and from which they ascended to Picacho del Veleta (3,389 m.), the second

highest in the penibetic system, third in the Iberian Peninsula after Mulhacén (3,479 m) and Aneto in the Pyrenees (3,404 m). A trip from France practically identical to that made by Charles Edmond Boissier ten years earlier, although the Swiss remained in Sierra Nevada much longer than the Alsatians.

Nor are the results comparable. Two brief reviews published in hidden annals, a letter to a Parisian colleague and a newspaper of the expedition that due to his personal nature the author refused to publish and someone came to see although today is missing, are the only reflection of a trip which still, left a zoological heritage perpetuated in time. The Sierra Nevada mountain goat, for example, bears his name (*Capra Pyrenaica hispanica Schimper*), but his work has been absent so far in all the scientific or mountain literature on Sierra Nevada.

III. A THEORY ABOUT QUATERNARY GLACIERS IN THE PENIBÉTICA MOUNTAIN RANGE

In number 806, 1849, of the Parisian periodical publication entitled "L'Institut, Journal Universel des sciences et des sociétés savantes in France et à l'étranger. 1st. Section Sciences Mathématiques, Physiques et Naturelles", published a short paper entitled *Notes géologiques, botaniques et zoologiques sur le midi de l'Espagne* in which the most relevant were the geological, botanical and zoological aspects of the trip made two years earlier, in the summer of 1847.

According to Schimper, the area that designates Montes de Granada or rounded hills of the East at whose foot the city sits, is formed by a "nagelflue" (special conglomerate of alpine rocks), whose constituent elements come from Sierra Nevada and consists of pebbles of micascists, calcareous sands, transition calcareous rocks and siliceous debris. It is in this conglomerate where gypsies inhabit numerous caves of the Albaicín. The seashells that are frequently attached to the rocks also demonstrate that this was formed in the sea and that Sierra Nevada experienced a great elevation of its tertiary deposits.

At the bottom of the great valleys of the Genil, which descends from the Mulhacén and the Veleta, followed by the Monachil, which does the same from Veleta and the Trevenque, large deposits of sand, rolled stones, angled fragments of shale mites and large erratic blocks fractured by ice can be seen, forming dykes of considerable power and presenting even in its smallest details the characters of the moraines that are still formed at the foot of the glaciers of the Alps.

For greater concreteness, he affirms that the moraine of the Valle del Genil leans on the side of Granada against the hills of the *nagelflue* and extends over a length of one thousand meters with a power of approximately one hundred meters.

In summary, Schimper's idea would be to consider the floods and conglomerates of the hills on which the Alhambra sits as a frontal moraine of a glacier that would descend through the valley of the Genil to Granada. This was accepted by some later scholars, such as José Macpherson in 1875, by granting glacial origin to the Alhambra conglomerates he considers as moraines of a generalized regional glacier that would have encompassed all of Sierra Nevada.

But according to Von Drasche in 1879, Schimper's proposal to consider both the formation of gonpholites and the conglomerate of the Alhambra as moraines, could not be taken into account and had led to many subsequent false observations, being only formations that previously had a great extension and were reduced or disappeared by the effects of running water corrosions.

However, in 1916 Obermaier considered Schimper's proposal as one of the theories still in force, with defenders such as Macpherson and Odón de Buen, opposed to that of Von Drasche who, qualifying as false his observations rejected the real and positive existence of glacial phenomena Quaternaries in Sierra Nevada. Obermaier was inclined to a third proposal, already outlined by another German, Otto Quelle in 1908 in which, maintaining the existence of glacial phenomena in the Sierra Nevada, reduced their intensity and constricted them to maximum heights, enforcing the opinion that it was a localized phenomenon and in no way regional and diffuse, as Schimper and his followers had proposed. This is the idea that eventually prevailed in the geology world.

IV. THE SIERRA NEVADA MOUNTAIN GOAT

About what truly took travellers to Sierra Nevada, the search for a new species of ibex, some of its conclusions are also known and, above all, the preserved description, although extremely brief, of a new species of Bouquetin which Schimper called "Hispanic goat". Indeed, the year after his trip, he produced and sent a brief note to the Academy of Sciences of Paris, which was read before it by M. Duvernoy on March 13, 1848 and published in its annual report, the "Comptes rendus".

In its text, he tells that during his trip through the mountains of Andalusia in the previous year, 1847, he

had special interest in locating a *bouquetin problématique* that had been told existed in Sierra Nevada and in the Serrania de Ronda, which the locals called *Cabra montés* or *montesa*. Not found in the Museums of London, Frankfurt or Vienna, it was a new species in Europe from which he located not less than eight models in Sierra Nevada, leaving some hunters commissioned to find him some more with winter fur. The author considers these specimens different from the one he had obtained in the Pyrenees or in the mountains of Asturias because there were no wild goats either in Guadarrama or Sierra Morena, while in Sierra Nevada, there were many. Same place where Boissier, on his trip in 1837, had encountered a herd of 20 specimens in the vicinity of Mulhacén. Schimper did not get there and his experience was only lived at the foot of the Veleta. And although in his brief text he announced the publication of a more extensive work he did not do, he did elaborate for this occasion a description of the physiognomy of an adult specimen.

In general, his views on the “Hispanic cap” have been less controversial than those referring to glaciers. Within the *Capra Linnaeus*, depicted in 1758, the first to describe the *Capra Pyrenaica* species was Schinz in 1838, which, based on the external morphology, specifically the fur design and the horns, was divided into four subspecies later, giving rise to the valid classification to date: the mentioned Pyrenean C.P (Schinz in 1838), the Hispanic C.P (Schimper in 1848), the Lusitan C.P

(Schlegel in 1872) and the Victoriae (Cabrera in 1911). Amongst all, it is Schimper’s Hispanic that, according to current experts has a greater distribution along the Mediterranean mountain arch, extending its populations from Gibraltar to the Ebro’s river mouth.

After a ten-day stay in Sierra Nevada, the travelers returned with their cargo of skins, stones and plants to Granada. And after sending their treasure to France through the port of Malaga, they returned to their country through the peninsular interior, in order to know something of Sierra Morena (Despeñaperros) and Guadarrama, coming to the conclusion that there were no longer any mountain goats in any of those locations.

At the end, Schimper’s work in Sierra Nevada must be remembered as a debatable theory about penibetic glaciers, the discovery or at least the first description of a new genus of Hispanic ibex and for the conservation of a Sierra Nevada daguerreotype, taken between the farmhouse of San Gerónimo and Granada, site where he remained herbalizing for three days and described simply as “delicious.”

Dollus-Ausset died in 1870 and Schimper survived him another decade, dying in Strasbourg on March 20, 1880, when in the permanent change of geopolitical location that has shaken this city throughout history, was part to the II German Empire.