

The Campiña and subbetic mountains of Cordoba

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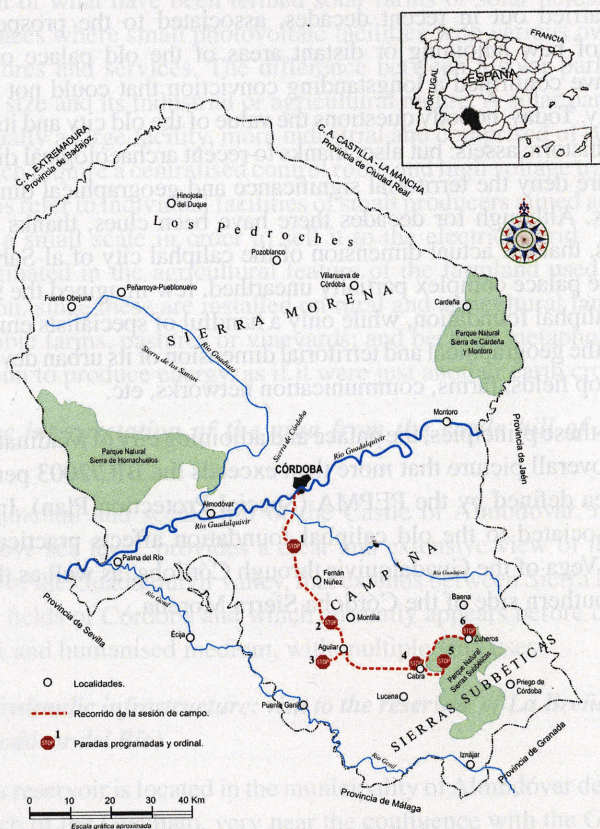


Figure 1: General map

General presentation of the outing

The outing that we are going to describe below will run through two large natural regions: the Guadalquivir Depression and the Subbetic Mountains. The former is the scenario of landscapes marked by the Guadalquivir and its tributaries on sediments from the Cenozoic Era, predominantly *Miocene*. The land, therefore, is young and soft and consequently very sensitive to the erosion of rivers and streams, which model a gently undulating relief, with moderate heights, gentle slopes and placed in an untidy succession of hillocks and open valleys.

As a whole, this broad strip, known as "Campaña del Guadalquivir", is an area with a very strong inclination towards agriculture. The earth is typically fertile and the prevailing crops are rain-fed cereals, olives and to a lesser extent, vineyards. Different sub-regions can be detected within the Guadalquivir Depression and the outing will take us through the "strict Valley of the Guadalquivir", the "Low Campaña" and the "High Campaña".

The natural inclination towards agriculture is dominant in these Campañas, but this has not been an obstacle to the generation of a series of wetlands in certain areas of the hinterland, which, due to their environmental values, have been recognised as "Nature Reserves". This is the case of the Wetland Areas of the South of Cordoba.

With respect to the other large natural region that the outing runs through – the Subbetic Mountains –, this is integrated within the *Alpine domain* and forms part of the great Andalusian mountain range. Compared with the gentle and undulating forms of the Campañas, the Subbetic mountains form a series of medium height reliefs, that are rough and precipitous, where the decisive geological elements are limestone from the Mesozoic Era (*Jurassic*), the presence of a permanent *allochthony* and the development of an extensive repertoire of *karst forms* whose environmental values have led the area to be accredited as a Nature Park.

Both large regions (Campaña and Subbetic mountains) also share a very valuable urban and architectonic heritage with a predominance of the fortress village model.

From the Valley to the Campaña: the cereal crop landscape

Contrasting scenarios, singular landscapes

In the broad perspective offered by the place, one of the few with these characteristics in the *campaña* environment, the backdrop to the north is made up

of the southern edge of Sierra Morena, a rectilinear escarpment of dark materials, the majority of which are *Palaeozoic* materials, whose mountain-like image contrasts with the fertile lowlands of the Depression that spread out at its feet.

It is precisely the Guadalquivir Depression, framed among the *Marian* reliefs to the north and the Subbetic Mountain ranges to the south, where we will make the first stop after entering the *Andalusian Campiñas*.

The middle sector of the province and intermediate section in the course of the large Andalusian river, the genesis of this space is linked to the *Alpine* folding, in connection with which the main relief lines of the south and east of Andalusia were configured: the Guadalquivir Depression per se and the Andalusian Mountain Ranges.

The landscape of the calm lands

From the geomorphologic viewpoint, the singularity of the Low Campiña comes about from the nature of its materials, mainly *greyish-blue marl* with a high *clay* content, the majority of which were deposited in the sea beds of the *Andalusian Gulf* when the thrusts of the *Alpine* movement had already ceased.

Since ancient times this area has been intensely given over to agriculture. Its gentle slopes, fertile soils and Mediterranean type climate with irregular but sufficient rainfall have made an early and integral occupation possible.

The main crop is rain-fed cereal, mainly wheat, which is produced in large parcels of land under an intensive *two-field crop rotation* system where it alternates with *soil-improving* sunflower crop. This is the system which, since the middle of the 20th century, in a process that was described as "*the most radical crop revolution ever seen in the Cordoba Campiña and in the entire Andalusian Valley*" (LÓPEZ ONTIVEROS, A., 1985), replaced the traditional "*three-field crop rotation*" system that had prevailed for centuries, and which today determines the visual image of the calm lands, "*an enormous undulating carpet of large geometrical pieces, occupied equally by wheat fields and sunflowers, and of changing colours depending on the time of the agricultural year*" (MATA, R. & SANS, C., 2004).

Another key that explains the landscape and character of the Low Campiña is an agricultural structure where there is an overwhelming predominance of the large property, which can be visualised much more clearly in the system of *tierras acortijadas* (land belonging to the *cortijo*) arranged by the arable land, which excludes any smaller parcelling and any activity that is not exclusively agricultural, and which represents, par excellence, the great Andalusian *latifundio* (large estate).

The High Campiña from the Cerro del Portichuelo

Basic aspects of physical geography

The decisive fact for the configuration of the High Campiña is that, due to its proximity to the Andalusian Mountains, the effects of the *Alpine orogeny* also affected the sediments that had been deposited in the *Andalusian Gulf*. The result was a landscape with more pronounced forms, higher altitudes (up to 450 m) and steeper slopes than those of the Low Campiña.

In addition, all of this has represented an increase in the erosive power of rivers and streams, which in many cases, will excavate their courses more efficiently and deeper, to the extent that materials from previous geological periods have been brought to light, including, above all, the materials from the Triassic period. One of the consequences of this is the formation and existence of salt pans in this High Campiña.

All the physical circumstances that configure the High Campiña come together in a substratum which, compared with the Low Campiña is much richer in *calcium carbonate*, with less clay and are sandier. In this context, the production of rain-fed cereals becomes difficult and problematic, fostering a change in the crops and a move towards olive groves and vineyards.

The olive grove and vineyard Campiña

Precisely due to its natural inclination to agriculture, this sub-region has been named "The olive-grove and vineyard Campiña". The first of these crops is much more important than the second; in fact it is the olive grove that has really left its footprint in the *High Campiña* landscape, whilst the vineyards are only predominant in very limited areas (Sierra de Montilla and Moriles Altos).

Even so, the quality and personality of the wines obtained from these vineyards have justified the *Montilla-Moriles Denominacion de Origen*. With the "Pedro Ximenes" grape variety as the base, the main types of wines produced are the "finos", although the "olorosos", "amontillados" and sweet raisin wines are also of an extraordinary quality.

With respect to the *settlements*, these are concentrated in small towns, and in villages or hamlets of a certain size in the High Campiña. In many cases, these are "*agro-towns*", in other words, centres of population which, due to their demographic contingent, should be considered as real towns but which, due to their economic dynamics and predominant activities, have a marked

rural nature. The majority of them can be considered as “*fortress-villages*”, located at the top of a hill, with the castle and church standing out above the rest, and with the houses clustered together around them, progressively moving down the slope until they reach the main roads.

The Lagunas de Soñar (lakes)

The Soñar Lake is the main lake of a series of *wetlands* which include the Amarga, Rincon, Tiscar, Jarales and Salobral lakes. The first two have permanent water, but the others – together with other smaller lakes – have seasonal water that dries up in summer. The ensemble was declared as Integral Reserves by the Spanish Law of 1984, and currently the lakes are considered as Nature Reserves due to their singular values as wintering and nesting places for migratory birds.

The wetland landscape: a “pearl” in the surrounding dry land

The Laguna de Soñar (lake) can be considered, due to its extension and dynamics, as the only lake of Andalusia.

According to RECIO & GÓMES (2008), it might have been formed after the Mid- and Late Pleistocene as a result of a series of processes involving the dissolution and subsidence of materials (lithologies of the Triassic and supra-Miocene calcarenites) which would end up by forming the uneven relief that today houses the troughs of the lake complex.

Soñar is rectangular in shape, its maximum depth is about 16 metres and it extends over a 53 hectare area. It is permanently flooded by slightly brackish waters and although its water sheet fluctuates, it remains throughout the year thanks to the *upwelling* of Puente de los Eucalpitos and to the intakes from the springs of Soñar and Escobar.

In an area that has been occupied by man since olden times and populated by olives, vines and some market gardens, some repopulations of holm oaks, broom and lentiscus also appear here, whose aim is to recover the old *Mediterranean woodland* and curb the erosive processes that threaten the lake. But it is the vegetation of the narrow *perilagunar* strip, with species such as wild reed (*Phragmites australis*), the common reed (*Arundo donax*) or the lesser bulrush (*Typha sp.*), that is the most specific and typical of the *wetland*.

With respect to its wildlife, we can highlight the existence of the *herring smelt*, a fish that is scarcely found in the Iberian Peninsula; but what really stands out with respect to the Soñar and confers upon it its classification as a

space of special biological importance, is the fact that it is the main wintering space for aquatic birds in the province of Cordoba; essential is the presence of the "White-headed duck" (*Oxyura leucocephala*).

Relationships between the human groups and the wetlands: consequences and derived teaching

The great singularity of the Laguna de Soñar lies in the fact that it has been a scenario where human intervention has managed to save an endangered species. This species is the *white-headed duck*. But this space also appears as a paradigm of the evolution of what in Spain have been considered and treated as *lacustrine* landscapes.

Aspects that show this evolution could be the following: having been a hunting space for centuries; continuous co-existence with the agricultural activity in the area; being an area of permanent *settlement* (the market gardeners of Soñar); having suffered a progressive loss of environmental values; benefiting later on from a chain reaction of the people, which will lead to the protection of the area, to the increase of *white-headed ducks* and to the return of the species to other Andalusian spaces from where it had disappeared; showing the conflict between the protected space and the nearest centres of population; becoming a scenario for the introduction of allochthonous species, some of which (*common carp* and *carpines*) will cause changes in the ecosystem; suffering truly risky experiences and actions (use of natural toxic substances, such as *rotenome*), to eradicate these foreign species and recover the typical features and dynamics of the ecosystem, etc.

Old Railway Station of Cabra (Green Way of the Subbetic Mountains)

The Green Way of the Subbetic Mountains is a recently devised infrastructure whose aim is to attract rural tourism, providing knowledge and enjoyment of the region's landscapes and environmental values. Its route, which runs through the south of the province of Cordoba for 8 km, coincides with the route of the old "oil train", an old railroad used to send the product to the main consumer centres and which served to consolidate these regions among the main producers in Spain. Today, thanks to hiking or bicycle rides, the Way takes us to picturesque villages and genuine landscapes of the municipal districts of Luque, Suheros, Doña Mencía, Cabra and Lucena; the continuation of this route through the neighbouring lands of Jaen completes a surprising 112 Km run.

The Subbetic Mountain ranges: a broken mid-mountain landscape

The structural component: the great lines of the relief

An area with extraordinary geological and geomorphologic complexity, ORTEGA ALBA (2009) distinguishes three sub-units in the Subbetic mountains within the limits of the province of Cordoba: the SE-NW orientated *mountainous spur*, the Priego-Alcaudete *Depression* and the W. *foothills*

The Cabra mountain range presents a rounded perimeter that limits to the N and NW with the High Campiña and to the S with the Carcabuey corridor. It is comprised of several rounded elevations the highest ones being the Picacho (1217 m), the Lastra (1242 m) and Lobatejo (1380 m).

The lithological component: the limestone landscape

It has been possible, due to the hardness of these deposits, to preserve the coverage of *limestone* and *dolomite rocks*, but other circumstances have also contributed to this, such as the actual fracture and cracking of the crags, which has facilitated the rapid infiltration of the majority of the rainfall, and above all, the early decrease in level of the *karst* base, since the end of the Miocene era, which considerably limits the external dissolving of the carbonates. However, the materials have not remained unharmed. Their limy nature per se, their topographic layout and the existence through the Quaternary era of climate periods with high rainfall, have favoured the development of important *karst* processes. These are the processes that really explain the current morphology of this bare landscape, a limy space with clear features, which, on the outside, offers a whole series of specimens of *exokarstic* shapes (with *sinks*, *karst valleys*, *lapies*, *poljes*, etc.) and which, under the surface, create a complex world of *grottos*, *galleries*, *wells* and *shafts*.

With respect to this enormous variety of forms, from the Poljé de la Nava vantage point, there is a magnificent view of two spaces that, in this regard, are anthological examples: the aforementioned *polje* (*polje*) and the *lapies* of Los Lanchares.

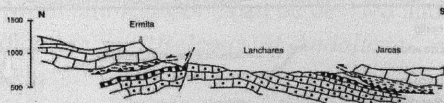
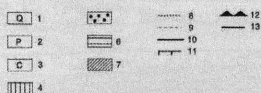
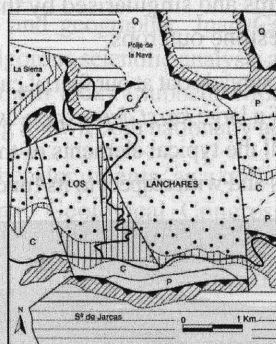
The lapies of Los Lanchares

This impressive *karst* surface starts in the place known with the expressive toponym of “*Los Pelaos*” (which translates as *The Bare*), referring to its bare and gaunt morphology, where the profuse outcrops appear full of

hollows and furrows and covered with surface striations that carve sharp stone edges.

Los Lanchares are inherited *lapies* and, at least in its master lines, it develops on very pure and homogeneous limestone, which, in this area of the Mountain range, appears in almost horizontal strata. This layout, the old edaphic coverage and the once abundant vegetation, helped retain the surface water and resulted in an intensification of the dissolving processes of the underlying rock. Thus, the limestone became progressively corroded and gradually evolved until it took on the extremely irregular morphology it has today

Subsequently, the *lapies* has evolved very little. However, and although with much less intensity, the *karstification* continues. But, with the current humidity conditions and the extreme infiltration of water that causes the generalised fracture of the crags, this is limited to detailed touches that give rise to a generalised *microlapies* over more exposed surfaces.



Source: Junta of Andalusia

Geological diagram of the Los Lanchares sector and the Polje de la Nava

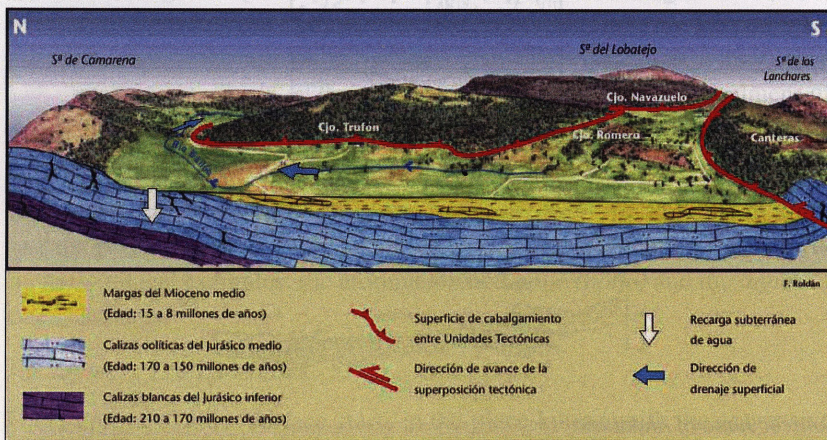
With these physical determining factors, it is easy to understand not only the lack of vegetation but also the absolute human vacuum of these areas, entirely lacking in any type of habitation and where the human activity can only be discerned by some stone walls used as open pens for stock-breeding of a very extensive nature, which is one of the few agricultural uses of these sterile spaces.

Another very different matter is the industrial use. And in this regard, the open wound represented by the stone *quarries* makes a more than considerable impact. These are inactive today but the necessary restoration landscaping work still has to be done and they generate the more obvious and negative visual impact in this special protection area.

The Poljé de La Nava

The second of the highly significant landscape *karst* forms, devisable from the vantage point is the *Poljé de La Nava*, also known in the area as the “*Llanos of the Virgen de la Sierra*” due to its flat morphology in the context of the rugged mountain forms and singularised by their agricultural wealth in the bare context of the limestone outcrops.

In view of the landscape that spreads out at our feet, it can undoubtedly be said that this is a beautiful example of a large *karst depression*, which, although of average dimensions, clearly shows all the typical elements of this type of formation, both relating to its genesis process and with respect to its functional and formal aspects.



Source: Junta of Andalusia (s.f.)

Initially, this polje was closed and it drained out almost entirely underground, but later on, it discharged the water through the river course of the Bailon River, converting the formation into a *fossil polje*.

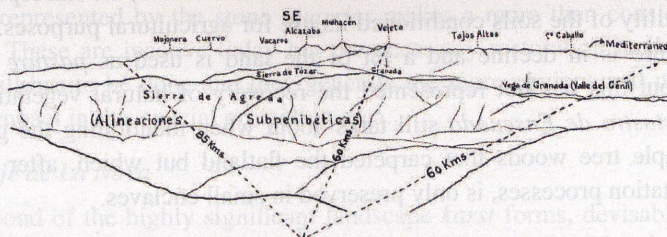
Nowadays, the drainage is still insufficient and, despite having constructed artificial drainage channels, flooding still occurs during periods of heavy rainfall. However, in a context of bare and broken rocks, the flat topography and fertility of the soils conditioned its use for agricultural purposes. Today, agriculture is in decline and a lot of the land is used as *pasture* for the cattle, but this has not represented the recovery of natural vegetation that the *Castastro de Ensenada* still talks about when mentioning the gall oak and maple tree woods that carpeted the flatland but which, after intense deforestation processes, is only preserved in small enclaves.

El Picacho: "Balcony and Geographic Centre of Andalusia"

For scientific purposes, the great discoverer of the natural values of this mountain range was the geologist and geographer, Juan Carandell, the first person to subject these reliefs to a rigorous scientific analysis and the person who proposed the name that identifies them today (Subbetic Mountain Range). He was also responsible for them being known both nationally and internationally.

Apart from his many other documents, as a collaborator in the organisation of the XIV International Geological Congress (1926) and responsible for the Outing/visit to Sierra Nevada, passing firstly through Cabra and Torca de Antequera, the travel log that he wrote and the actual visit of the congress delegates represented a real discovery of these *mountain chains*. Together with the other values mentioned above, he also underlined the fact that, on reaching the peak of the Picacho, 1216 m above sea level, there is a watchtower from where the structure and organisation of all the Andalusian relief units –Plateau (Sierra Morena), Guadalquivir Depression and Andalusian Mountain Ranges–, can be devised and understood, which led to its classification as "*Balcony of Andalusia*" and "*Geographical Centre of Andalusia*".

Carandell can also be thanked for his work in preparing the reports which, in 1929, led to it being acknowledged and declared as a "*Natural Site of National Interest*", meaning that the area of the Virgen de la Sierra Sanctuary was one of the first Protected Natural Spaces in Spain.



PANORÁMICA DE SIERRA NEVADA, DESDE LA SIERRA DE CABRA

(dibujo de J. Carandell)

Water colour painting by Juan Carandell for the book "Sierra Nevada",
by Constancio B. de Quirós

Finally, it is worth pointing out that the coincidence of all these natural values with a series of scientific, cultural, religious facts, etc., which convert this landscape into a clear example of what we have agreed to call "*landscape with symbolic and heritage value*" (NARANJO RAMÍRES, 2007).

On the edge of the Cabra Massif: the Bailon River Canyon

The path borders around the foot of the Cabra Massif, establishing the contact between the *rocky vanguard* of the *thrust* front and the lands of the southern periphery of the *Campaña* through some *foothills* where olive groves become the sole crop.

The canyon of the Bailon River is the natural exit towards the *Campaña* of the Bailon River, the course that drains the Polje de la Nava and its neighbour of Fuenseca.

Situated on the mountain edge, it is a narrow *gorge* with vertical walls with *river-karst* origin, which was formed in recent geological eras, in the Quaternary era, as a result of the collapse of an old underground cavity and

the subsequent erosive incision of the river on the bottom of the course. And it must not be forgotten that one of the most typical features of limestone landscape is its intense underground circulation, a fact which, in the geographical area of the Cabra Mountain range, takes on special importance and explains the existence of endless underground *grottoes* and *galleries*. The best known of these are the Cueva de los Murciélagos (Bats' Cave) – Suheros–, and the Sima de Cabra (Cabra Shaft).

Today, the spectacular nature of the forms of the relief and the chromatic contrast between the bare rocks and the carpet of vegetation that makes use of the smallest pieces of soil, make the *canyon* one of the most visited places of geological and landscape interest of the Subbetic Mountains.

Suheros Vantage point

The road that going to the Cueva de los Murciélagos gives access to a vantage point which offers us a fantastic panorama whose most outstanding features are:

- vertical view of the *ravine* worked by the Bailon River.
- interior of the Mountain range, where remains of old crops can still be seen today.
- old railway Bridge, which today forms part of the Green Way of the Subbetic Mountains.
- agricultural olive grove landscape, set on the slopes of the Mountain range and in the High Campiña region of Cordoba, spreading out to the province of Jaen.
- spectacular is the view from here of the town centre of Suheros, whose most outstanding features include:
 - the special configuration of its intricate road network, typical of Al-Andalus villages.
 - closely related to the above, the general radial layout of the streets around the historical centre, above all insofar as the perimeter of the “Villa” is concerned.
 - mention of its meticulous houses, with their clean and regular aspect, their whiteness and Arab tiled sloping roofs is inevitable.

the place occupied by its Castle also acquires a special dimension which, on a tall rock next to the *canyon* of the Bailon River, acts as an exceptional guard watching over the Subbetic Mountain range and the High Campiña region of Cordoba, as well as its connections, to the east, with the nearby province of Jaen.

Today, the spectacular nature of the forms of the relief and the climatic contrast between the bare rocks and the carpet of vegetation that makes use of the smallest pieces of soil, make the landscape of the most visited places of geological and landscape interest of the Subbetic Mountains.

The road that going to the Cueva de los Murciélagos gives access to a vantage point which offers us a fantastic panorama whose most outstanding features are:

- Vertical view of the river valley, the Bailon River, which is still by the interior of the Mountain range, where remains of old crops can still be seen.
- Finally, it is worth pointing out that the coincidence of all these elements with a very old railway bridge, which today forms part of the Green Way of the landscape, gives us a clear example of what we have called "cultural landscape with symbolic and heritage value" (NARANJO RAMIREZ, 2007).
- Agricultural olive grove landscape, set on the slopes of the Mountain range and in the High Campiña region of Cordoba, adjoining the province of Jaen.

The path borders around the foot of the Corda Massif, establishing the contact between the mountain range and the Campiña through some of its most outstanding features.

The special configuration of its intricate form between the Bailon River and the Campiña is the natural extension of the Bailon River, the course that drains the Corda Massif, and the Campiña, closely related to the above, the general relief layout of the Subbetic Mountains.

Situated on the mountain side, it is a "cultural landscape" with river valley origin, which was formed in recent times, in the context of its traditional houses, with their clean and regular aspect, built with white and red fired sloping roofs is inevitable.