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**THE VALLESIAN IN THE TYPE AREA
(VALLES-PENEDES, BARCELONA, SPAIN)**

by

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Introduction. The Vallès-Penedès is an intramontainous basin situated to the northeast of the Iberian Peninsula. It is associated to the system of tectonic depressions which range from the North of Germany to Spain, across the southeast of France (Rhône basin, etc.), taking part of an incipient process of rifting developed during the Upper Oligocene and the Lower Miocene. This basin has a length close to 100 km and its width ranges between 7 and 10 km. Its orientation is ENE—WSW and it is limited by two important faults of different displacement: the Southern fault were less active than the Northern one and its activity ended during the Lower Miocene. On the contrary, the Northern fault is still in action. The Vallès-Penedès basin is filled by sediments which range from the Lower Miocene (MN3 zone) to the Lower Pliocene (MN14 zone). It has provided one of the most important assemblage of Mammal localities from western Europe (specially of *Hipparion*-faunas).

In this depression, it is possible to differentiate overall between five depositional units (AGUSTÍ et al., 1984):

- A Basal Conglomerate Unit of indeterminate age (probably Aquitanian).
- A Lower Continental Complex (Orleanian, Lower Miocene).
- A Marine and Transitional Complex (Upper Burdigalian—Langhian).
- An Upper Continental Complex (Mid to Upper Miocene, Astaracian to Turolian).
- A Pliocene Continental Unit.

The sections in the Upper Continental Unit are the ones best represented in the basin outcropping in the more central and northern sectors (Fig. 1). The distribution of facies in this unit indicates that these are composed of alluvial fan deposits controlled by the northern fractures. This complex has yielded a high number of fossil localities ranging from the Astaracian (MN6 and specially MN7/8) to the Lower Turolian (MN11): in other words, the zones preceeding and following the Vallesian.

The Vallesian: outcrops and localities

The Vallesian is a Mammal stage established by CRUSAFONT (1950) to designate the faunas characterized by the first entry of the genus *Hipparion* into Europe. This author realized that most of the *Hipparion* localities in the Vallès-Penedès basin have a composition different of that from the classical localities of Pikermi and Samos in Greece. In his original definition CRUSAFONT defined the Vallesian as a transitional stage with a significant grouping of "Vindobonian" (now Astaracian) elements associated with *Hipparion* and few "Pikermian" (=Turolian) elements.

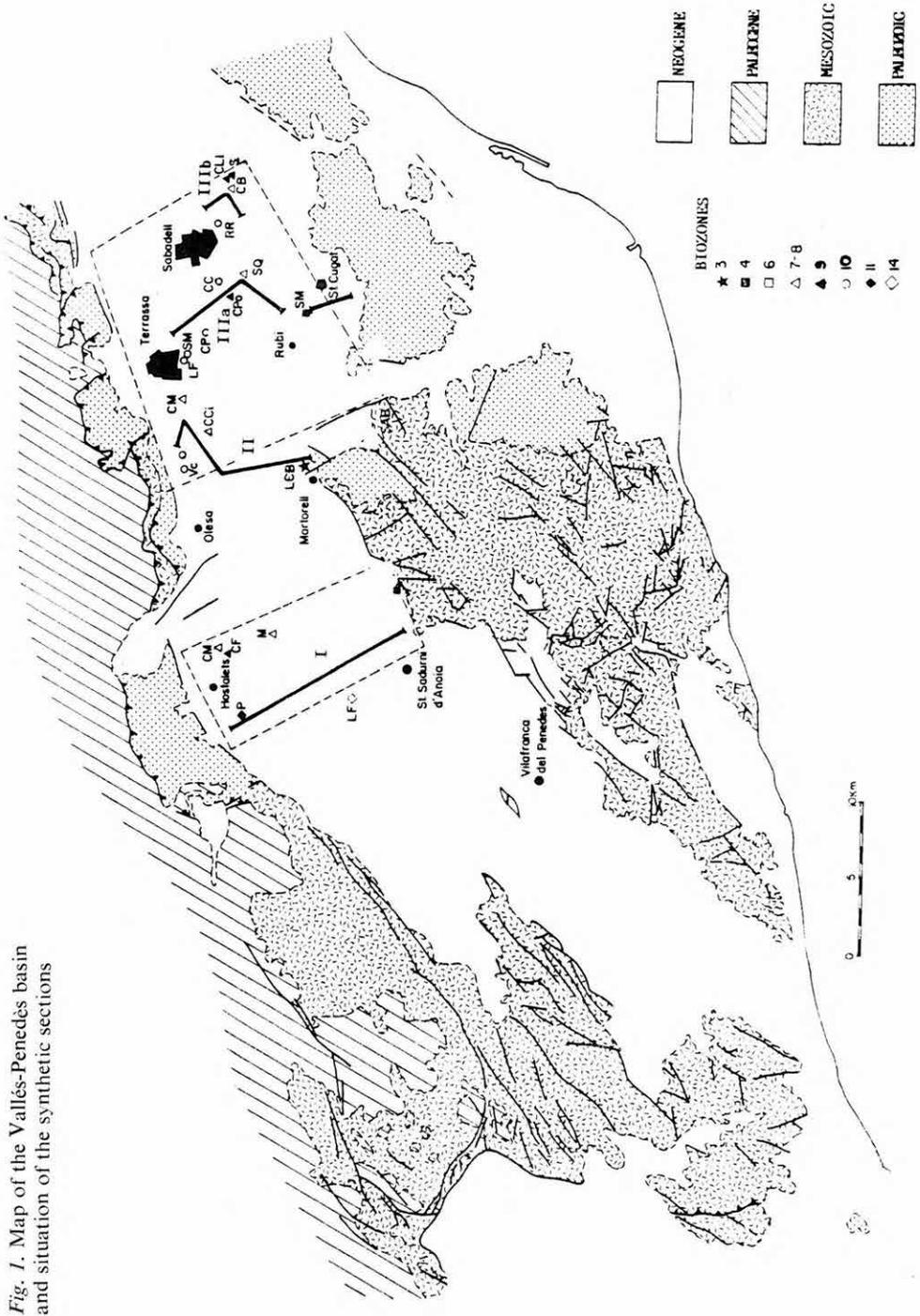


Fig. 1. Map of the Vallès-Penedès basin and situation of the synthetic sections

As regards outcropping conditions, continuity of the series and frequency of Vallesian localities, significant differences exist between the two large sectors (Vallès and Penedès) into which the basin has been divided.

In the eastern sector, all the known localities of the Vallesian and, in general, of the Upper Continental complex have been found at essentially lutitic levels, developed in marginal zones and outer areas of alluvial fans. The relative position of these localities is well-established (Fig. 4, see AGUSTÍ et al., op. cit.). This sector has been divided into two areas. In the western one, only the Upper Vallesian outcrops (localities of Viladecavalls). There has been no record so far of the Lower Vallesian. The eastern area of the western sector is where the type-locality of the Vallesian, Can Llobateres, is located (CRUSAFONT, 1965). The poor quality of the outcrops in this area is due to the well developed quaternary overlay and the markedly fractured nature of the zone, which makes this sector a compartmentalized area of raised and sunken blocks. In spite of this, local partial successions have been established (although the stratigraphic columns are not totally continuous). The biostratigraphic record of the Vallesian in this sector is very complete, due to the frequency of the localities and the richness of their faunistic lists: Can Ponsic, Santiga, Can Llobateres, Polinya (MN9); Can Casablanques, Riu Ripoll (MN10a); Sta. Margarida, Can Perellada, Trinxera Autopista, Torrent Febulines (MN10b).

Biozonation of the Vallesian in the Vallès—Penedès (Fig. 2)

MEIN (1975) divided the Vallesian into two biozones, MN9 and MN10, which were in turn subdivided by AGUSTÍ (1981) and AGUSTÍ et al., (1984). Thus, the four phases established for the Vallès-Penedès are as follows:

1) *Hostalets de Pierola (Hipparion beds) phase (Fahlbuschia crusafonti partial range zone)*.

This is a phase detected solely in the eastern sector (Fig. 4). The levels of this phase are in continuous transitional contact with the beds of the Upper Astaracian (MN8). The most important locality in this phase is Can Flaquer (Fig. 4). Biostratigraphically the onset of the Hostalets phase is marked by the appearance of *Hipparion* and the replacing of *Euprox furcatus* by *E. dicraniocerus*. In the rest, there are not changes in relation to the levels of the Upper Astaracian. The biotope of this phase was considered to be open and dry (AGUSTÍ et al., 1984).

2) *Can Llobateres phase (Cricetulodon range zone)*.

This phase is very well represented in the western sector and the type-locality is located here. Contact with the underlying deposits, which are well documented, is by fault (Fig. 4): St. Quirze/Can Ponsic, Castell de Barbera/Santiga, etc. This second phase of the Lower Vallesian is marked by the disappearance of the cricetids *Cricetodon*, *Fahlbuschia*, *Megaericetodon ibericus* and the rinocerotid species *Aceratherium simorreense*. Among the Rodents, *Cricetulodon* and the first murid, *Progonomys*, appear (the latter, at the top of the biozone). Quantitatively speaking, it represents a more important change than that which took place between the MN8 and the MN9. The biotope has been considered to be wet and wooded (AGUSTÍ et al., op. cit.).

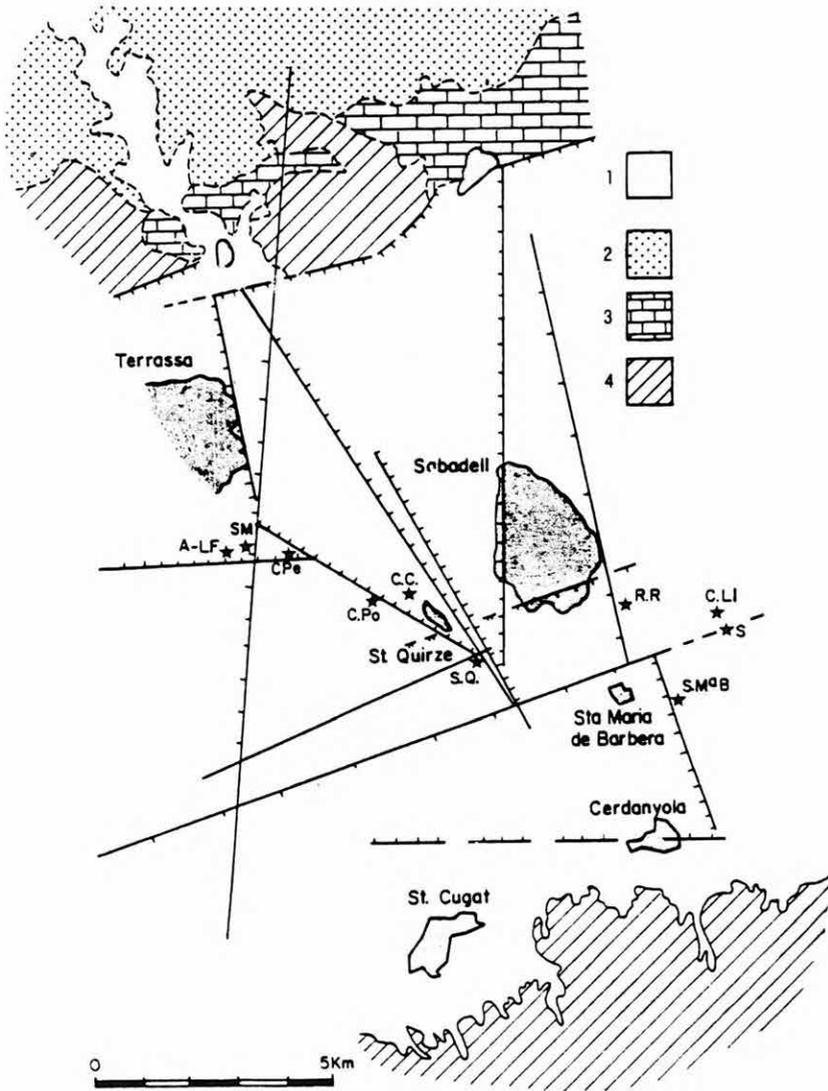


Fig. 3. Localities of the east Sector

1 Neogene and Quaternary, 2 Paleogene of De Erbo basin, 3 Triassic, 4 Palaeozoic

Eomyids, two forms of Cricetids (*Megacricetodon* and *Eumyarion*), two species of Bovids and the Cervid *Euprox dicraniocerus*. It is marked by the appearance of a new species of Murid (*Progonomys hispanicus*), the eastern Suids *Schizochoerus* and *Microstonyx*, the Bovids *Tragoportax* and *Graecoryx* and the hyaenid *Adcrocuta*. The predominant biotope in this phase has been considered to be dry and open.

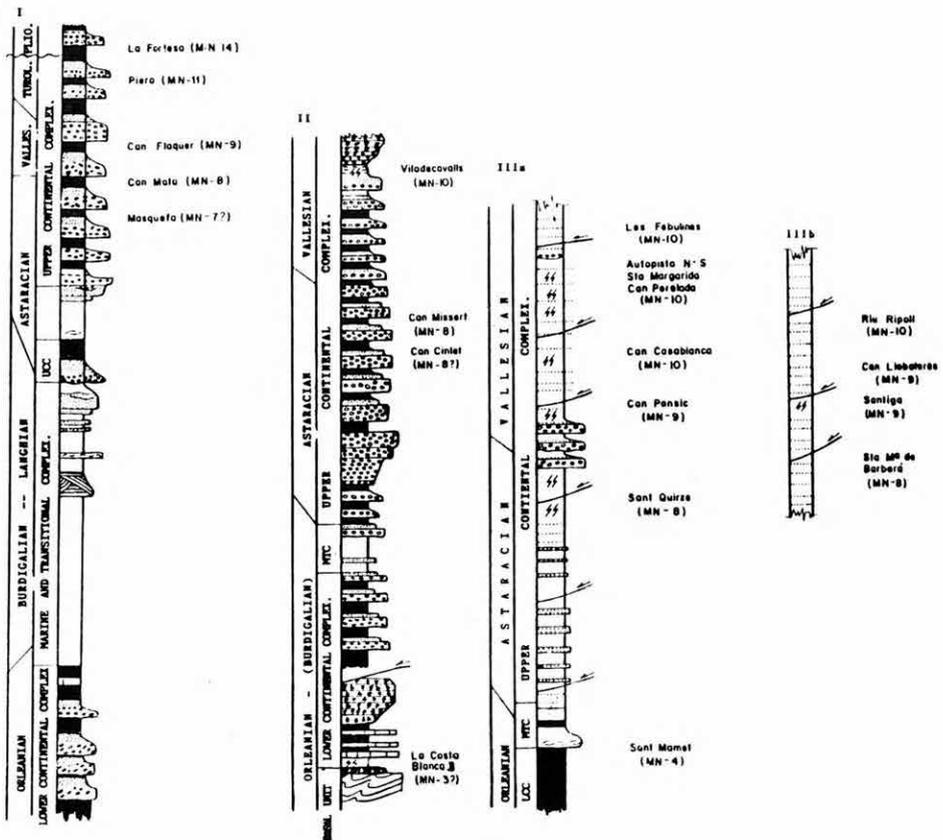


Fig. 4. Situation of the Mammal localities in the sections

4) Terrassa phase (*Rotundomys bressanus* range zone).

This phase is present in the eastern sector in various localities situated around the city of Terrassa (Fig. 1). It is characterized by the definitive disappearance of the Pongidae, *Listriodon* and the Astaracian—Vallesian *Palaeotragus* group. *Pliopithecus* reappear as well as a small sized form of *Euprox*. The biotope is considered to have been wet and wooded.

No complete sequence exists for localizing the transitional sedimentary passing from this phase to the Lower Turolian (MN11), which, however is represented in the Penedès sector by the locality of Pera.

Conclusions. AGUSTÍ et al. (op. cit.) proposed a model based on alternating dry and open episodes with others which were wet and wooded, for the Mammal associations of the Miocene of eastern Spain. During the Upper Astaracian and the Lower Vallesian this alternating of phases does not involve important faunistic ruptures. Generally speaking, the taxa existing in the previous wet phase recover in the following wet phase. However, this general pattern is broken on the boundary

between the zones MN9 and MN10. In this limit we observe the final disappearance of *Protragocerus*, *Miotragocerus*, *Listriodon*, *Hyotherium*, *Parachleuastochoerus*, *Euprox* and, among the Rodents, the Eomyidae and most of the Cricetid and Glirid species. The migratory movement on this boundary is, in addition, the most important in the whole Vallesian: *Tragoportax*, *Graecoryx*, *Aderocuta*, *Paramachairodus*, *Schizochoerus*, *Microstonyx* and *Progonomys hispanicus* appear. It is also worthwhile nothing that these immigrants are, on the one hand, elements from drier biotopes than the preceding ones in the previous wet phase (zone with *Cricetulodon*). On the other hand, they are typically Turolian elements (only *Schizochoerus* is not quoted for the Turolian in the Iberian Peninsula). The other group of elements forming the associations of the MN 10 are descendants of Astaracian elements (e.g., *Pliopithecus*, *Dorcatherium* or *Micromeryx*) or Vallesian ones (*Hipparion*), the latter three forms lasting into the Lower Turolian of the Iberian Peninsula (MOYÀ-SOLÀ, 1983).

Therefore, to sum up, the Lower Vallesian is a fauna essentially Astaracian in character although with *Hipparion*, whereas the Upper Vallesian fauna is largely Turolian in character with wet relicts from the Upper Astaracian—Lower Vallesian.

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