valley of the Guadalquivir is again comparatively gradual, but even here in the eastern half of the Sierra Morena the passes are few, the most important being the Puerto de Despeñaperros, where the Rio Magana has cut for itself a deep gorge through which the railway now ascends from Andalusia to Madrid. Between Andalusia and Estremadura farther west the communication is freer, the Sierra Morena being there broken up into series of small chains.

Of the mountains belonging to the tableland the most continuous are those of the Cantabrian chain, which stretches for the most part from east to west, parallel to the Bay of Biscay, but ultimately bends round towards the south between Leon and Galicia. Almost everywhere it consists of two parallel ranges, the higher of which, the more southerly, is the immediate continuation of the Pyrenees. The highest summits of the chain belong to the Jura limestones of the Penas de Europa, on the borders of the provinces of Santander, Oviedo, Leon, and Palencia. The highest of all is the Torre de Ceredo, which attains the height of at least 8750 feet, and next is the Pena Prieta (8300 feet). At the sources of the Sil the main chain divides into two branches, enclosing the fertile and thickly-populated district known as El Vierzo, once the bed of a lake, now watered by the stream just mentioned and its tributaries. The whole chain is remarkable for its intricate ramifications and its wild grandeur, but, as already indicated, is not so much of a barrier to communication as might be expected from its general aspect. Besides the railways above mentioned it is crossed at many points by bridle-paths and roads.

A peculiar feature of the chain and the neighbouring parts of the tableland is formed by the *parameras* or isolated plateaus, surrounded by steep rocky mountains, sometimes even by walls of naked rock. Among the larger of these are the bleak districts of Siguenza and Soria, round the headwaters of the Duero,—districts which separate the mountains of the so-called Iberian system on the north-east of the tableland from the eastern portion of the central mountain chains of the peninsula. Of these chains, to which Spanish geographers give the name Carpetano-Vetonica, the most easterly is the Sierra de Guadarrama, the general trend of which is from south­west to north-east. It is the Montes Carpetani of the ancients, and a portion of it (due north of Madrid) still bears the name of Carpetanos. Composed almost entirely of granite, it has an aspect when seen from a distance highly characteristic of the mountains of the Iberian Peninsula in general, presenting the appearance of a saw­like ridge *(sierra)* broken up into numerous sections. Its mean height is about 5250 feet, and near its centre it has three summits (the highest named the Pico de Penalara) rising to the height of nearly 8000 feet.

A region with a highly irregular surface, filled with hills and parameras, separates this sierra from the Sierra de Gredos farther west. This is the loftiest and grandest sierra in the whole series. Its culminating point, the Plaza de Almanzor, attains the height of 8725 feet, not far short of that of the highest Cantabrian summits. Its general trend is east and west ; towards the south it sinks precipitously, and on the north it descends with a some­what more gentle slope towards the longitudinal valleys of the Tormes and Alberche which separate it from another rugged mountain range, forming the southern boundary of the paramera of Avila. On the west another rough and hilly tract, similar to that which divides it from the Sierra de Guadarrama in the east, separates it from the Sierra de Gata, the westernmost and the lowest of the Spanish sierras belonging to the series. These hilly intervals between the more continuous sierras greatly facilitate the communica­

tion between the northern and southern halves of the Spanish tableland. The Guadarrama is indeed crossed by three good pass-roads, and even the Sierra de Gredos has a road across it connecting Avila with Talavera de la Reina by the Puerto del Pico ; but for the most part there are only bridle-paths across the sierras, and up to the present date not a single railway crosses any one of the sierras directly. The only railway crossing the central system of mountains is that from Madrid to Avila, which traverses the interval between the Sierras de Gredos and Guadarrama, passing through numerous tunnels on the way. A railway from Madrid to Segovia to cross the latter sierra at the Puerto de Navacerrada (5830 feet),@@1 the pass at present crossed by the principal high road across these mountains, is now (1886) in course of construction.

On the southern half of the tableland a shorter series of sierras, consisting of the Montes de Toledo in the east (highest elevation 4600 feet) and the Sierra de Guadalupe in the west (highest elevation 5100 feet), separates the basins of the Tagus and Guadiana. The southern system of mountains bounding the Iberian tableland—the Sierra Morena—is even less of a continuous chain than the two systems last described. As already intimated, its least continuous portion is in the west. In the east and middle portion it is composed of a countless number of irregularly- disposed undulating mountains all nearly equal in height.

Even more important than the mountains bounding or crossing the tableland are those in the north-east and in the south, which are connected with the tableland only at their extremities. The former are the Pyrenees *(q.v.),* the latter are the Sierra Nevada, and the coast ranges still farther south. The Sierra Nevada, or “snowy sierra,” is a well-defined chain, between 50 and 60 miles in length, and about 25 miles in breadth, situated to the south of the valley of the Guadalquivir, and stretching from the upper part of the valley of the Jenil in the west to the deep valley of the Almeria in the east. It is composed chiefly of soft micaceous schists, sinking precipitously down on the north, but sloping more gently to the south and south-east. Its culminating summit, the Cerro de Mulahacen (11,660 feet), is the highest in Spain, and the range contains several other peaks upwards of 10,000 feet in height, and above the limit of perpetual snow. On both sides deep transverse valleys *(barrancas)* follow one another in close succession, in many cases with round basin-shaped heads, like the *cirques* of the Pyrenees. In many of these cirques repose alpine lakes, and in one of them, the Corral de Veleta, there is even a small glacier, the most southerly in Europe. On the south the transverse valleys of the Sierra Nevada open into the mountainous longitudinal valley of the Alpujarras, into which open also on the other side the transverse valleys from the most easterly of the coast sierras, the Sierra Contraviesa and the Sierra de Almijara. The latter are continued farther west by the Sierra de Alhama and Sierra de Abdalajiz. Immediately to the west of the latter sierra lies the gorge of the Guadal- horce, which now affords a passage for the railway from Malaga to Cordova ; and beyond that gorge, to the west and south-west, the Serrania de Ronda, a mountain group difficult of access, stretches out its sierras in all directions. To Spanish geographers the coast ranges just mentioned are known collectively as the Sierra Penibetica. North­east of the Sierra Nevada two small ranges, Alcaraz and La Sagra, rise with remarkable abruptness from the plateau of Murcia, where it merges in that of the interior.

The only two important lowland valleys of Spain are those of the Ebro and the Guadalquivir. The former occupies the angle in the north-east between the Pyrenees

@@@1 About 3700 feet above the level of Madrid, 2700 feet above that of Segovia.