

THE GEOLOGY OF THE AQUITAINE BASIN, FRANCE.

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The Aquitaine basin of southwestern France is a large sedimentary basin comprising more than 35,000 square miles in areal extent. The southern margin of the basin extends along the northern front of the Pyrenean mountains for 190 miles. The western margin extends for 230 miles along the Atlantic ocean.

The Strait of Poitou northeast of Bordeaux connects the Aquitaine basin with the Paris basin. At the southeastern margin of the Aquitaine basin, the Strait of Carcassonne opens into the Languedoc and Rhone basins.

From a morphological standpoint, the Aquitaine basin is a land of gently undulating hills with the exception of its flat western coastal plains. The basin rises gradually from the Atlantic ocean eastward into the foothills of the "Massif Central." The highest peak of the Pyrenean mountains, *Pic de Nethou*, reaches a surface elevation of 11,168 feet above mean sea level.

From an orogenic standpoint, the Hercynian orogeny of late Paleozoic time played a major influence on the Aquitaine basin. The Pyrenees are a *plis de fond*, or upwarp of the Paleozoic platform, which are complementary to the downwarped basins of the Ebro and Garonne of Spain.

Superimposed unconformably above this old eroded mountain belt is an epicontinental, marine, and sedimentary series ranging from Triassic to Upper Jurassic.

A geosynclinal trough was formed along the north forefront of the Pyrenees in which were deposited (above the continental Carboniferous and Permian) a flysch facies of nearly 30,000 feet of sediments of Triassic and Cretaceous rocks.

Another major transgression, initiated with the Jurassic, filled the entire basin with dolomitic limestones which graded laterally into marly limestone in the western part of the Pyrenees.

The Laramic facies of the Pyrenean uplift commenced during the Cenomanian stage of the middle Cretaceous.

The Tertiary history of the basin was featured by a series of transgressions and regressions of epicontinental seas. After the major Lutetian orogenic phase of the Paleogene took place, continental deposits were washed down from the Pyrenees in a fluvio-lacustrine environment. However, marine facies deposition continued in the extreme western part of the Aquitaine basin until the Helvetian stage. Thus, a major Tertiary development of more than 10,000 feet is represented. The principal orogeny occurred during the upper part of the lower Eocene.

In the southwestern part of the Aquitaine basin, the diapiric salt structures comprise isolated salt domes, piercement folds with Triassic salt plugs, large Triassic massifs, anticlines with deep diapiric plug, diapiric salt dikes along fault planes, and erratic outcrops.

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Uplift of the belt of Triassic rocks along the forefront of the Pyrenean mountains has been discontinuous and connected with the various phases of Pyrenean orogeny. Final upthrust occurred during the Aquitanian stage at the end of Oligocene time.

Folds now concealed within the Aquitaine basin were truncated by erosion and subsequently overlapped by Miocene marine and lacustrine muds and basal Piedmont formations.