

to the south, in Charente, some limestones containing Portlandian fossils are covered by others with *Corbula inflexa*, *Physa*, *Paludina*, etc., possibly Purbeck. Fresh-water limestones, gypsiferous marls and dolomites (about 200 feet), and containing *Corbula forbesiana*, *Physa wealdiana*, *Valvata helicoides*, *Trigonia gibbosa*, etc., occur in the Jura, round Pontarlier and near Morteau, in the valley of the Doubs.

The Upper Jurassic rocks of southern France and the southern flanks of the Alps, or what has been termed the Mediterranean basin, present a facies so different from that which was originally studied in England, northern France, and Germany that much difficulty was for many years experienced in the correlation of the deposits, and much discussion has arisen on the subject. From the researches of Opper, Benecke, Hébert, and later writers, the true meaning of the southern facies is now better understood. It appears that the divisions ranging above the Oxfordian are represented in the southern area by a singularly uniform series of limestones, indicative of long unbroken deposition in deeper water, and unvaried by those oscillations and occasional terrestrial conditions which are observable further north. The name of Tithonian was given by Opper to this more uniform suite of strata, which were marked by the mixed character of their cephalopods, and by their peculiar perforated brachiopods of the type of *Terebratula diphya* (*janitor*).<sup>77</sup> Around Grenoble, the massive limestones resting upon some marls with species belonging to the zone of *Ammonites tenuilobatus*, contain *Terebratula diphya* associated with ammonites closely linked with Neocomian types. In the Basses Cevennes, the limestones attain a thickness of from 1200 to 1400 feet. At their base lie marls and marly limestones containing *Ammonites macrocephalus*, *A. transversarius* and *A. cordatus*. A band of bluish limestone with bituminous marls (65 feet), belonging to the zone of *A. bimammatus*, represents the Corallian. Some gray limestones (260 feet), with *A. polyplocus*, contain fossils of the zone of *A. tenuilobatus*, equiva-

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<sup>77</sup> For a study of the Tithonian fauna see A. Toucas, Bull. Soc. Geol. France, xviii. 1890, p. 560.