

In the central part of the northern Apennines Prof. Sacco regards as Eocene a mass of strata 5500 feet thick, which he subdivides as follows:<sup>47</sup>

Bartonian. 100 metres.	{	Gray marls with sandy calcareous layers; numerous fossils (Zoophycus, Lithothamnium, Nummulites Tchihatcheffi, N. striata, Orbitoides radians, Operculina, corals, bryozoa, crinoids, etc.)
Parisian. 1500 metres.	{	A thick series of marly and shaly limestones (Flysch), alternating with sandstones (Helminthoidea labyrinthica, Chondrites and other fucoids). Roofing slates. Shales and sandstones (Macigno). Sandy grayish and brownish marls with calcareous sandy beds (Lithothamnium, Nummulites biarritzensis, N. Lamarcki, N. lucasana, Assilina exponens, A. granulosa, Orbitoides, Operculina, Alveolina, corals, echini, crinoids, fish-teeth, etc.)
Suessonian. 100 metres.	{	Shales and gray and brown marls, sandstones and limestones.

To the Upper Eocene series of this region has been assigned a great series of serpentines, gabbros, diabases, soda-potash granites, and other eruptive rocks, with tuffs and conglomerates, marking copious submarine volcanic activity.<sup>48</sup>

**India, etc.**—As above stated, the massive Nummulitic limestone extends through the heart of the Old World, and enters largely into the structure of the more important mountain chains. In India a tolerably copious development of Eocene rocks has been observed, but it is not quite certain where their upper limit should be drawn to place them on a parallel with the corresponding groups in Europe. The following subdivisions in descending order are observed in Sind:<sup>49</sup>

Nari group. Sandstones without marine fossils, and probably of fresh-water origin, 4000 to 6000 feet, representing, perhaps, Upper Eocene and Oligocene or Lower Miocene beds of Europe.

Kasauli and Dagshai groups of sub-Himalayas.

Kirthar group. A marine limestone formation in general, but passing locally into sandstones and shales. The upper limestones contain Nummulites garansensis, N. sublævigata.

Nummulitic limestone of Sind, Punjab, Assam,

<sup>47</sup> Prof. Sacco has contributed many papers on this subject. See, for example, Bull. Soc. Geol. France (3) xvii. 1889, p. 212.

<sup>48</sup> C. de Stefani, Boll. Soc. Geol. Ital. viii. fasc. 2, 1889; a copious list of previous writers on the subject will be found in this paper.

<sup>49</sup> Medlicott and Blanford, "Geology of India," chap. xix.