

GENERAL SUBDIVISIONS.

The subdivisions of the Tertiary in general use were introduced by Lyell in the first edition of his *Geology*. They were based by him primarily on his own geological investigations in England and Europe, and on those of the French conchologist, Deshayes, who was already familiar with the fossil species of the Paris Basin. The proportion of living to extinct species was accepted as the distinctive character of the subdivisions. These subdivisions, and the proportions now adopted for the approximate limits, are as follows:—

1. EOCENE period (from ἠώς, *dawn*, and καινός, *recent*): no species, or less than 5 per cent living.
2. MIOCENE period (from μείων, *less*, and καινός): 20 to 40 per cent living.
3. PLIOCENE period (from πλείων, *more*, and καινός): more than half the species living.

The Miocene and Pliocene are sometimes united under the name NEOCENE (from νέος, *new*, and καινός), especially when the divisions are not well differentiated. The term *Oligocene* (from ὀλίγος, *few*, and καινός) is sometimes used for a fourth division, consisting of the upper part of the Eocene and the lower part of what had been referred to the Miocene.

The term *Oligocene* was proposed by Beyrich, of Berlin, in 1855. In 1864, Hörnes, of Vienna, proposed the term *Palæogene* for the combined Eocene and Oligocene, and *Neogene* for the Miocene and Pliocene; *Eogene* has also been used in place of *Palæogene*. Further, the Lower Eocene has also received the separate name of *Paleocene*. J. W. Dawson adopted, in 1889, the term *Orthocene* for the Lower Eocene, *Nummulitic* for the Middle, and *Proicene* for the Upper or (as he says) that of the Vicksburg Epoch.

On the geological map published in 1884 by the U. S. Geological Survey, Eocene includes the Eocene and Oligocene, and Neocene the Miocene and Pliocene. In 1887, Heilprin proposed the substitution of *Eogene*, *Metagene*, and *Neogene*, severally, for Eocene + Oligocene, Miocene, and Pliocene + Quaternary.

The name *Tertiary* is a relic of early geological science. When introduced, it was preceded in the system by *Primary* and *Secondary*. The first of these terms was thrown out when the crystalline rocks so called were proved to belong to no particular age, — though not without an ineffectual attempt to substitute for it *Paleozoic*; and the second, after use for a while under a restricted signification, has given way to *Mesozoic*. *Tertiary* holds its place, simply because of the convenience of continuing an accepted name. *Neozoic* is sometimes used in place of *Tertiary*, while it is also occasionally made a substitute for the whole Cenozoic. It was originally proposed by Edward Forbes to comprise both the Mesozoic and Cenozoic.

NORTH AMERICA.

GENERAL GEOGRAPHICAL FEATURES OF THE TERTIARY ERA.

It has been shown that the deposition of the Laramie beds and the upturning which followed left the great interior of North America emerged. The Cretaceous sea, which had covered the Western Continental Interior and the Rocky Summit region from Mexico to the Arctic coast, was gone, excepting