

The Devonian of California, mentioned on page 580, contains, according to Schuchert, *Favosites Canadensis*, *Cyathophyllum robustum*, *Cladopora labiosa*, *Syringopora Maclurii*, and is referred by him with a query to the Corniferous; at Gazelle, in Siskiyou County, occur *Diphyphyllum fasciculum* and *Acervularia pentagona*; and he suggests that the beds may be of later date (1894).

In the lower part of the Eureka Devonian limestone (p. 589) occur, according to C. D. Walcott, the following Corniferous or Lower Devonian species of New York, etc.: *Favosites hemisphericus* Y. & S., *Cyathophyllum rugosum* Edw. & H., *Orthis impressa*, *Stropheodonta perplana*, *S. punctulifera*, *Chonetes hemisphericus*, *C. mucronatus*, *Spirifer raricosta*, *S. varicosus*, *Atrypa reticularis*, *Nucleospira concinna*, *Meristella nasuta*, *Platyceras carinatum*, *P. conicum*, *P. dentalium*, *P. nodosum*, *Phacops rana*, and many others. But with these are very many that are Middle and Upper Devonian in New York and elsewhere, and among these are the three Hamilton Tentaculites, *T. attenuatus*, *T. bellulus*, *T. gracilistriatus*. Besides, some New York Upper Helderberg species are found in the upper part of the 6000 feet of Devonian limestone. Again, many of the species of the lower part occur also in the upper part, showing long survival of individual forms; this is true of *Orthothetes Chemungensis*, of 4 species of *Productus*, *Chonetes deflectus*, *Stropheodonta perplana*, 2 of *Spirifer*, *Rhynchonella castanea* of Meek (a Mackenzie River species), a *Paracyclas*, *Styliolina fissurella*. *Orthis McFarlani* Meek is a second Mackenzie River species; and as the two are Lower Devonian in Nevada, they may be so at the arctic localities. Many of the species are represented in the Devonian of Iowa, or the Continental Interior, where the waters were purer and probably deeper than in the New York Bay, and therefore more like those of the Eureka district.

Of the Eureka Devonian species that are found only in the upper division, the following are confined to the Lower Devonian in New York: *Syringopora Hisingeri*, *Cyathophyllum corniculum*, and *Chonetes mucronatus*; and the following are among those that are Middle or Upper Devonian in New York or Iowa: *Orbiculoidea minuta* (Hamilton), *Orthis Tulliensis* (Ham.), *Productus lacrymosus* (Chemung), *P. speciosus* (Ch.), *Spirifer disjunctus* (Ch.), *Athyris angelica* (Ch.), *Rhynchonella duplicata* (Ch.), *R. Laura* (Ham.), *R. sinuata* (Ch.), *Bellerophon mæra* (Ch.). The preceding conclusions appear to be well sustained, unless it may be that there are unseen faults in the limestone. See, further, Walcott, *Pal. Eureka*, *U. S. G. S.*, 4to, vol. viii., 1884, where 144 Devonian species are described; and also Arnold Hague, *Rep.*, vol. xx., *U. S. G. S.*

### 3. HAMILTON PERIOD, OR MIDDLE DEVONIAN.

#### ROCKS—KINDS, SUBDIVISIONS, AND DISTRIBUTION.

The Hamilton group was so named from Hamilton, in Madison County, N.Y. The beds have a wide range, like the Corniferous limestone. They extend from eastern New York (Schoharie County) westward to Iowa; but in New York and Pennsylvania they are mainly shales and sandstones, of shallow water origin, and wholly calcareous only in the Central Interior region. Moreover, they have great thickness to the eastward, 1500 feet, but thin down rapidly to the westward, being only 300 to 1100 feet thick near Lake Erie, thinning down to 20 to 50 feet. They border Lake Erie in Ontario; pass by the south end of Lake Huron into Michigan, where they are limestone, and 10 to 120 feet thick. They appear also in Ohio, as 25 feet of impure bluish limestone; in Indiana, where at the Falls of the Ohio, above Louisville, they are 20 feet thick, and include the hydraulic and overlying beds of the limestone formation of the place. They occur also in Kentucky; Illinois,