

Crustaceans, and other inferior species, a place in the Cambrian would properly be made for it, unless the beds were proved to be Huronian by evidence that they had been formed before the epoch of mountain-making which closed Archæan time. Mere divergence to this extent from the Lower Cambrian in life would not be sufficient to require separation from it.

*Progress through the appearance and disappearance of species.* — This feature in the world's biological progress is well illustrated in Walcott's reports. Of the many species of Trilobites from the Lower Cambrian, very few are known to occur in the Middle Cambrian; and few of those of the Middle, in the Upper. According to the facts thus far gathered, it may seem that events passed with a rush; that exterminations and renewals followed one another at short intervals. But the thickness of the rocks proves that the three divisions of the period were immensely long. There may have been many successive faunas in each. It is quite certain, judging from the teachings of the geological past, that the abrupt breaks are generally, if not always, breaks in the record, not breaks in the succession of species.

The total number of ascertained species from the American Lower Cambrian is stated to be less than 200. The number 200, though large, considering the remoteness of the period, is very small compared with that of the marine invertebrates of existing American seas. There are reasons for its being so small; for (1) only a small part of the rocks has been examined; (2) hardly a tenth of the deposits made in the Lower Cambrian would have escaped the destroying action of denuding agencies; and (3), in any case, only a small part of any fauna is likely to become fossilized. The number of species known from the Middle Cambrian is much smaller than that from the Lower. This is not evidence of fewer species at one time than another in the fauna of the world. It may be proof that the conditions were unfavorable over the regions geologically studied for the preservation of their remains. These unfavorable conditions may have been due to temporary changes of water level that made densely brackish seas over large parts of the continental surface, or as great fresh-water seas; or to other local circumstances not now discoverable. The absence of Lamellibranchs in the Middle Cambrian, although present in both the Lower and Upper, means *the absence of fossils from the rocks, not of species from the faunas.*

*Progress in Cambrian life after the Lower Cambrian.* — This progress is strongly marked. In the Upper Cambrian, Brachiopods are of more genera; Conularia is added to the Pteropods; Gastropods are of normal size, and those with spiral shells are multiplied; and Crustaceans are advanced to the grade of non-multiplicate Hymenocarids; and before the epoch ended there were true Crinoids and Star-fishes in the seas; Trilobites had appeared of the genus *Asaphus*; Ceratiocarid Crustaceans were in the waters; and besides these, *Cephalopods*, the higher Mollusks, were represented by species of *Orthoceras* and *Cyrtoceras*, the straight form of *Orthoceras* apparently preceding the curved form of *Cyrtoceras*.