

Second. The beginning of the characteristics of an era is to be looked for in the midst of a preceding era; and the marks of the future coming out to view are prophetic of that future.

Third. The end of an era may come, either after the full culmination of the idea or phase, or earlier, at the commencing prominence of a new and grander phase in the history. It may be as ill-defined as the beginning, although its prominent idea may stand out boldly to view. Thus the era of Coal-plants was preceded by the occurrence of related plants far back in the Devonian. The era of Mammals was foreshadowed by the appearance of mammals long before, in the course of the Reptilian era. And the era of Reptiles was prophesied in types that lived in the earlier Carboniferous era. Such is system in all history. Nature has no sympathy with the art which runs up walls to divide off her open fields.

Fourth. Mere length of time, without culminating or characterizing events beyond that of rock-making, is not a criterion of value in the subdividing of geological history.

CORRELATION OF THE RECORDS.

The *chronological order* is that demanded, as in any history. The first object is, accordingly, to ascertain which are *equivalent* strata, or those of the same *geological horizon*, and where in the chronological succession each stratum belongs.

As even the shorter divisions of geological time have in general been of very long duration, the *equivalent* or *correlate* strata of distant regions cannot be known to be precisely synchronous in origin. A long time, measured by thousands of years, may in fact have intervened between the commencement of beds that are most alike in all those points by which age and equivalency are determined.

Huxley, in view of the impossibility of determining true synchronism, proposed to designate by the term *homotaxial* (from the Greek *ὁμός*, *same*, and *τάξις*, *order*) those strata, in regions more or less widely separated, that have apparently the same relative position in the geological series.

Difficulties. — The following are some of the difficulties encountered in attempts to ascertain the true chronological succession: —

1. The stratified rocks of the globe include an indefinite number of limestones, sandstones, shales, and conglomerates; and they occur horizontal and displaced; conformable and unconformable; part in America and part in Europe, Asia, and Australia; here and there coming to view, but over wide areas buried beneath soil and forests.

Moreover, even the same bed often changes its character from a sandstone to a shale, or from a shale to a limestone or a conglomerate, or again to a sandstone, within a few miles or scores of miles, and sometimes within a few rods; or, if it retains a uniform composition, it changes its color so as not to be recognized by the mere appearance. In the United States, many a sand-