undisturbed and unaltered rocks (c), or than others lying at some distance (e f), which contain worn fragments derived from the granite.

On the other hand, an interbedded or contemporaneous igneous rock has its date precisely fixed by the geological horizon on which it lies. Sheets of lava or tuff interposed between strata in which such fossils as Calymene Blumenbachii, Leptæna sericea, Atrypa reticularis, Orthis elegantula, and Pentamerus Knightii occur, would be unhesitatingly assigned by a geologist to submarine volcanic eruptions of Upper Silurian age. A lava-bed or tuff intercalated among strata containing Sphenopteris affinis, Lepidodendron veltheimianum, Leperditia, and other associated fossils, would unequivocally prove the existence of volcanic action at the surface during the Lower Carboniferous period, and at that particular part of the period represented by the horizon of the volcanic bed. Similar eruptive material associated with Ammonites, Belemnites, Pentacrinites, etc., would certainly belong to some zone in the great Mesozoic suite of formations. An interbedded and an intrusive mass found on the same platform of strata need not necessarily be coeval. On the contrary, the latter, if clearly intruded along the horizon of the former, would obviously be posterior in date. It will be understood, then, that the two groups have their respective limits determined mainly by their relations to the rocks among which they may happen to lie, though there are also special internal characters that help to discriminate them.

The value of this classification for geological purposes is great. It enables the geologist to place and consider by themselves the granites, quartz-porphyries, and other crystalline masses, which, though lying sometimes perhaps at