derivative copper have been found near Wexford in the Devonian, not far from points where mines of copper are worked in the Silurian strata.*

Although the precise age of such copper lodes cannot be defined, we may safely affirm that they were either filled at the close of the Silurian or commencement of the Devonian period. Besides copper, lead, and silver, there is some gold in these ancient or primary metalliferous veins. A few fragments also of tin found in Wicklow in the drift are supposed to have been derived from veins of the same age.†

Next, if we turn to Cornwall, we find there also the monuments of a very analogous sequence of events. First the granite was formed; then, about the same period, veins of fine-grained granite, often tortuous (see fig. 692., p. 569.), penetrating both the outer crust of granite and the adjoining fossiliferous or primary rocks, including the coal-measures; thirdly, elvans, holding their course straight through granite, granitic veins, and fossiliferous slates; fourthly, veins of tin also containing copper, the first of those eight systems of fissures of different ages already alluded to, p. 621. Here, then, the tin lodes are newer than the elvans. It has indeed been stated by some Cornish miners that the elvans are in some few instances posterior to the oldest tin-bearing lodes, but the observations of Sir H. de la Beche during the survey led him to an opposite conclusion, and he has shown how the cases referred to in corroboration can be otherwise interpreted.‡ We may, therefore, assert that the most ancient Cornish lodes are younger than the coal-measures of that part of England, and it follows that they are of a much later date than the Irish copper and lead of Wexford and some adjoining counties. How much later it is not so easy to declare, although probably they are not newer than the beginning of the Permian period, as no tin lodes have been discovered in any red sandstone of the Poikilitic group, which overlies the coal in the south-west of England.

There are lead veins in the Mendip hills which extend through the mountain limestone into the Permian or Dolomitic conglomerate, and others in Glamorganshire which enter the lias. Those worked near Frome, in Somersetshire, have been traced into the Inferior Oolite. In Bohemia, the rich veins of silver of Joachimsthal cut through basalt containing olivine, which overlies tertiary lignite, in which are leaves of dicotyledonous trees. This silver, therefore, is decidedly a tertiary formation. In regard to the age of the gold of the Ural Mountains, in Russia, which, like that of California, is obtained chiefly from auriferous alluvium, it occurs in veins of quartz in the schistose and granitic rocks of that chain, and is supposed by MM. Murchison, De Verneuil, and Keyserling to be newer than the syenitic granite of the Ural—perhaps of tertiary date. They observe, that no gold has yet been found in the Per-

* I am indebted to Sir H. de la Beche for this information. See also maps and sections of Irish Survey.

† Sir H. de la Beche, MS. notes on Irish Survey.

‡ Report on Geology of Cornwall, p. 310.