

careous formations of the Alps, the upper secondary strata lose the soft and earthy character which distinguish the oolites and chalk in England, and are converted into marble. The coal also, which is very imperfectly formed in the English oolite, has, in the same limestone formation in the Alps, the character of true mineral coal.

A still more remarkable coal formation occurs at Alpnach, near the lake of Lucerne in Switzerland, where a bed of coal is found at the depth of two hundred and eighty feet, from the surface. Over the coal, there is a stratum of bituminous limestone containing fluviatile shells, and bones and teeth of the large mammalia, particularly the teeth of a species of mastodon. The specimens which were shown me by Professor Meissner of Berne, on my return from the Swiss Alps, made me regret exceedingly not having visited Alpnach. Notwithstanding the occurrence of the bones of large land quadrupeds in the stratum over the coal, the coal approaches in character nearly to mineral coal, and the strata of micaceous sandstone and shale above it, have a close resemblance to those in our English coal-fields. Though, from the organic remains, we are compelled to place the coal of Alpnach among the tertiary strata, or to admit the occurrence of an anomalous formation like the one at Stonesfield, still I believe the true geological position of the coal of Alpnach is problematical; and it deserves the particular attention of some English geologist, well acquainted with the different coal-fields in his own country, and the lignite formations in various parts of Europe.

It will be seen by a reference to the Geological Map and the Chapter containing an Outline of the Geology of England, that there is a considerable part of South Britain where coal has not been found. Two important questions may be asked;—Do the coal strata extend under the parts where coal has not yet been discovered? And if they do extend beyond their present known limits,—what practicable means can be employed to obtain the coal? With respect to the first question—it is well ascertained by boring, that the coal strata do, in some places, extend under the magnesian limestone, by which they are in some of the northern counties immediately covered, though it was formerly supposed that the coal terminated before it reached the magnesian limestone, or was there cut off by a fault. In a considerable part of England, the coal-fields are immediately covered by what is called the red marle or new red sandstone; but there are but few situations where the red marle and sandstone have been sunk through for coal. I am, however, decidedly of opinion, that under the red marle adjacent to the coal districts in my native county, Nottinghamshire, the regular coal strata will be found; and that there is a high degree of probability that rock salt or brine springs will be found in the red marle itself, particularly in those parts of the county where beds of massive gypsum occur. The same remark might be extended to the red marle and sandstone districts ad-