

On the practical operations of mining among the ancients much curious information may be found in an interesting paper by Mr. Hawkins, published in the first volume of the *Cornish Geological Transactions*.

The Arabian writers in the middle ages appear to have cultivated mineralogy with some success; the first foundation of a rational arrangement of minerals was laid by Avicenna at the close of the tenth century.

Several Italian writers are cited as having noticed the occurrence of fossil shells in the hills of that country at an early period. The celebrated Boccacio is among these; and in the fifteenth century Alessandro degli Alessandri proposed the hypothesis that the axis of the earth's rotation might originally have had a different situation from the present,* as a means of accounting for the change in the place of land and sea indicated by this circumstance. Fracastoro, in 1517, enters largely into this subject, and observes that the phænomena are such that they cannot be satisfactorily explained by a transient convulsion, such as the deluge alone. Palissy, a French writer in 1580, has been cited with high praise by Fontenelle as an original discoverer, on the ground of similar observations; but the priority of Fracastoro is evident.

George Agricola, a native of Misnia, who flourished during the first half of the sixteenth century, published on several branches of Mineralogy; in particular he has illustrated in a full, precise, and clear manner, the various phænomena of metallic veins.

Before the close of that century, an Englishman, George Owen of Pembrokeshire, left behind him a very valuable manuscript work on the topography of his native county. In this he has traced with much accuracy the direction and extent of the strata of coal and the limestone which accompanies them through the whole of South Wales, and pointed out the connections of this tract with similar districts in Gloucestershire and Somersetshire. This appears undoubtedly the earliest attempt to establish the important and fundamental geological fact, that the same series of rocks succeed each other in a regular order

* A similar notion found an advocate in Voltaire, who even believed in the wild tradition of the Egyptians, that the Sun had *twice risen in the west* within the memory of that nation, ascribing this to a supposed revolution of the Earth's axis round one of the equatorial diameters, which he imagined was completed in four millions of years. It is needless to add that astronomical observation does not afford the slightest ground for these extravagant speculations; the real change of the obliquity of the ecliptic is a phænomenon arising from causes of a very different nature: it is a secular variation confined within very narrow limits, and inadequate to account for any geological appearances.