of the strongly impregnated rocks and clay-beds of this formation, like the bitumen of the still more strongly impregnated limestones and shales of the Lias, seems to have had rather an animal than vegetable origin. The shales of the Eathie Lias burn like turf soaked in oil, and yet they hardly contain one per cent. of vegetable matter. In a single cubic inch, however, I have counted about eighty molluscous organisms, mostly ammonites, and minute striated scallops; and the mass, when struck with the hammer, still yields the heavy odor of animal matter in a state of decay. The lower fish-beds of the Old Red are, in some localities, scarcely less bituminous. The fossil scales and plates, which they enclose burn at the candle; they contain small cavities filled with a strongly scented, semi-fluid bitumen, as adhesive as tar, and as inflammable; and for many square miles together the bed is composed almost exclusively of a dark-colored, semi-calcareous, semi-aluminous schist, scarcely less fetid, from the great quantity of this substance which it contains, than the swine-stones of England. Its vegetable remains bear but a small proportion to its animal organisms; and from huge accumulations of these last decomposing amid the mud of a still sea, little disturbed by tempests or currents, and then suddenly interred by some widely spread catastrophe, to ferment and consolidate under vast beds of sand and conglomerate the bitumen* seems to have been elaborated. These bituminous schists, largely charged with sulphuret of iron, run far into the interior, along the flanks of the gigantic Ben We-

* "In the slaty schists of Seefeld, in the Tyrol," say Messrs. Sedgwick and Murchison, "there is such an abundance of a similar bitumen, that it is largely extracted for medicinal purposes." — (*Geol. Trans.* *for* 1829, p. 134.)