

pose the conditions of the two classes of dikes united,—we have but to suppose that the hollow filled by the aqueous deposition had been previously filled by an igneous injection,—in order to account for all the phenomena of an igneous dike accompanying a merely aqueous one. We can scarce account in this way, however, for the formation of the dikes at Eathie, seeing that the shale in which they are included is of so soft and decaying a character, that no igneous rock could of possibility be more so ; nor, even were the case otherwise, could the upper portion of the dikes have existed as open chasms during the period in which the process of decay would have been taking place in the depths below. They would have infallibly filled up with the fragments detached from the sides and edges.

Mr. Strickland, in a paper on the subject in the *Transactions of the London Geological Society*, states the problem very strongly. ‘The substance of these dikes is such,’ he says, ‘that it is impossible to refer them to a purely igneous origin ;’ and yet, however much ‘it may resemble an aqueous product,’ it is as impossible to doubt that the dikes themselves are genuine ‘intrusive dikes penetrating the Lias shale in all directions.’ He adds farther, as his ultimate conclusion in the matter, that the ‘sedimentary structure of the rock forbids us to refer it to igneous injection from below ;’ and that, ‘notwithstanding the complete resemblance of these intrusive masses to ordinary plutonic dikes, we have no resource left but to refer them to aqueous deposition, filling up fissures which had been previously formed in the Lias.’ There is a peculiar rock in the neighbourhood, which throws, I am of opinion, very considerable light on their origin. It is what may be termed a syenitic gneiss, abounding in minute crystals of hornblende, that impart to it a greenish hue ; and in one place we find it upheaved so directly among the Lias beds, that it breaks their continuity. It raised them so high on its back, that the denuding agencies laid the back