

as consisting of but two great divisions,—first, the traps proper, including all igneous masses, from the porphyries to the basalts, which were ejected from the abyss in a molten form, and which either overflowed from their vents and craters certain portions of the earth's surface, whether sub-aqueous or subaërial, or, forcing their way between strata of the sedimentary rocks, formed among them dykes, or beds, or pillar-like masses; and secondly, trap-tuffs, which, though igneous in their components, were ejected from craters in the form of loose ashes and detached fragments, or were ground down by the agency of water, and subsequently arranged in regular strata under the same laws which have given their stratification to the rocks of aqueous origin amid which we so frequently find these trap-tuffs intercalated. You will at once see that the division here is a natural one. There is a wide difference betwixt a stratum of broken glass and scorixæ, the débris of a glass-house arranged by the tide on the beach on which it had been cast down a few hours before, and a continuous sheet of plate-glass still retaining its place in the mould into which it had been run off by sluices from the furnace. And such is the difference between trap-tuff and trap proper. We have to arrive, too, when we find them occurring, as in this neighbourhood, among the rocks of a district, at very different conclusions regarding their date and history. Without inquiring whether in some rare instances an eruption of volcanic mud might not possibly be ejected, by a sort of hydraulic-press process, between strata of previously existing rock, and thus a tuff-bed come to be formed which was not only newer than the stratum on which it rested, but also than that by which it was overlaid, we may receive it as a general fact, that the true tuff-bed, like beds of the ordinary sedimentary rocks, is more modern than the stratum on which it rests, and more ancient than the stratum which overlies it; that if it occur, for instance,