

in some instances is even converted into plumbago, the substance of which black-lead pencils are constructed. Anthracite generally occurs in rocks of an earlier date than those which are strictly comprised in the carboniferous group ; but it is convenient to notice the nature of the rock in this place, in connexion with the substance of whose vegetable nature no doubt can exist. By a series of interesting experiments, Dr. MacCulloch has shown that there is a natural transition from bitumen to plumbago. Hydrogen predominates in the fluid bitumen ; bitumen and carbon in coal : in anthracite, bitumen is altogether wanting ; and in plumbago, the hydrogen also has disappeared, and carbon only, or chiefly, remains. With this general explanation of the various states in which carbonized vegetable substances occur, I pass to the consideration of the process of petrification, that wonderful operation by which the most delicate animal and vegetable structures are converted into solid rock.

26. NATURE OF PETRIFICATION.—In many instances, we find a mere substitution of mineral matter for the original animal or vegetable matter. Such are those casts of sandstone, indurated clay, and other consolidated materials, which bear the forms and impress of organic bodies, but possess neither the internal structure, nor any vestige of the constituent substance of the original. The casts and impressions of shells, of the stems and leaves of plants, and of fish-scales ; and the flints,