

vapour and gases which escaped from a lava stream at the surface, Scrope formed the opinion that eruptive phenomena might be traced to the mobility of the lava. According to his observations, lava, as it issues from a volcanic vent, very seldom has the appearance with which we are familiar in a hot mass of iron or glass, but is usually in a viscid, seething condition, impregnated with elastic vapours, and enclosing many crystallites which move freely in the surrounding fluid in virtue of the passage of the vapours through it. As the vapours explode and escape, the motion of the mineral constituents is impeded and the lava solidifies. Scrope applied this theory to subterranean lava. He supposes a fused rock-mass saturated with water, under pressure of super-incumbent solid rock; then the pressure being the same and the temperature raised, or the temperature being the same and the pressure relaxed, the water will pass into the condition of vapour, and a certain amount of heat be made latent. The crystalline constituents of this subterranean magma are separated by the elastic vapour, the lava swells and passes into a fluid condition. The degree of liquidity in the whole mass was thought by Mr. Scrope to depend chiefly on the weight of the mineral constituents and the fineness of the crystals. If the subterranean lava be horizontally extended, the compressed vapours, in trying to escape, press the lava against the upper strata, cause earthquakes, and finally fissures into which the seething lava flows. If the fissures widen towards the interior of the earth, the rising lava forms dykes, and as these narrow towards the earth's surface, they strengthen the crust; but if, on the other hand, the fissures are wider in the upper horizons of the crust than in the lower, they remain partially open, and form relatively weak parts in the earth's crust, readily liable to renewed eruptions.

Scrope endeavoured to explain all the phenomena associated with volcanic eruptions upon the basis of the above theory. In favour of it, he noted the periodicity in eruptive activity; how after each eruption, when presumably the fissures have been blocked with rock-material, a period of rest ensues, but when the vapours have once more accumulated in the deep volcanic magma, the old vent again bursts open or a new orifice forms. In the case of land volcanoes, the ejected products of successive outbursts surround these orifices with the characteristic circular or elliptical form. The particular