

The mass in this case appeared never to have had any crater. It rose with steep walls directly from the soil formerly covered with vegetation, which it had destroyed. It appeared as if the trachytic lava had issued from a central cavity, and boiled over as it were, till it set into the form of the dome.

The ground around the crater was still almost bare of vegetation, but some plants were beginning to colonize the denuded soil, strongly impregnated as it was with various volcanic chemical products. Three species of ferns, as first colonists, grew as isolated plants here and there: and along the courses of two small streams fed by hot springs, issuing from the base of the volcano, where the poisoned ground was constantly washed, a good deal of vegetation was to be found, amongst which were several sedges and grasses, and a rush.

About the mouths of cavities from which hot gases were slowly being exhaled, a moss was found growing in great abundance, with several lowly organised Cryptogams; the whole being confined to the spot occupied by these fumeroles and forming green patches in the midst of the surrounding entirely bare rock,

The hot streams were full of green algæ, and as these streams, being very small became cooler and cooler from their source downwards, I was able to determine the temperature at which the algæ commenced to flourish.

At the source of one of these streams, as it issued from beneath the volcano, the water had a temperature of $145^{\circ} \cdot 2$ F., and was thus too hot to be borne by the hand. Here there were no algæ at all growing in the water. There were, however, small green patches on stones projecting out of the bed of the stream into the air, and also along the margins of the stream where they were not bathed by the hot water itself, but only soaked up the moisture and received the spray occasionally.

At a distance of a few yards lower down, in a little side-pool fed by the stream, abundance of algæ were growing, but the pool had a temperature of only $101^{\circ} \cdot 5$ F., though the stream which fed it constantly was at 122° F.

Lower down again, algæ were growing in the middle of the stream, in water at $113^{\circ} \cdot 5$ F., and this seems thus to be the limit of temperature at which the particular algæ gathered, will flourish in water impregnated with a certain amount of salts in solution. No doubt the amount of salts present has a limiting effect as well as the temperature.

Oscillatoria have been observed growing in water, at a much higher temperature, even 178° to 185° F.* The fact is interesting, as showing that green algæ of some considerable com-

* See W. T. Thiselton Dyer, F.L.S., etc. "Proc. Linn. Soc., Bot.," Vol. XIV., p. 327. Also pp. 32 and 331 of present work.