The influence of the components of the atmosphere are, therefore, sufficiently apparent, and also their hygroscopic effects and action, and we shall proceed to consider more particularly the modification of these influences by heat and cold, dryness and moisture.

Within the tropics vegetable forms assume a most gorgeous and luxuriant appearance, and a boundless variety, and nature exhibits herself in her most splendid and brilliant witchery. In the temperate zones, she appears in more sober and less magnificent array, and, as we approach the poles, we gradually lose all trace of luxuriance, and it dwindles away until, at last, we encounter the regions of everlasting snow and cheerless darkness. From this, then, we may conclude, that the light and heat of the sun are the most powerful agents in determining the existence and growth of vegetables. In winter, vegetation ceases. We have shown that at a temperature of 32° Fahr. when water solidifies it cannot proceed. However, natural springs are found to preserve in winter a temperature often higher than the surrounding air, particularly in latitudes above 45° ; and this, with other well ascertained facts regarding the temperature at great depths, led to the investigation and proof of the fact, that the roots of large trees, penetrating deep into the soil, which becomes warmer as we descend, are thus enabled to preserve the internal fluids at a temperature higher than the exterior air. The local temperature of a country, or its climate, depends much on its distance from the Equator, and its height or elevation above the level of the sea. However, in the two hemispheres, the decrease of heat follows different laws, decreasing more rapidly in the southern than the northern. It is also affected by the longitude. The cold encreases less with the latitude in the west of Europe than to the east or west. If we proceed northward under meridian 90° either east or west, the cold encreases with startling rapidity J. A.

To be continued.

INFLUENCE OF SOIL ON VEGETATION.

IV. Magnesia.

We must next consider an earth of less common occurrence than any of the former. It is also composed of equal weights of a metal called magnesium and oxygen. It is, when in union with carbonic acid, soluble in water containing that acid. Both the sulphate and nitrate of magnesia, compounds of equal weights of sulphuric and nitrate acids, are sometimes found in soils. These are the salts of magnesia that we generally meet with. It is occasionally, as in the english counties of Derby, Northumberland and Nottingham, found associated with carbonate of Lime in Lime rock ; and there is a strong prejudice against all lime associated with magnesia. When Lime, containing this substance, is applied to soils in the same proportion as pure Lime, it proves very caustic, and has been