

and cells we see when plants are microscopically and even macroscopically examined. In the infancy of chemical science it was customary to call in the aid of the vital principle in further explanation. It seems that we have now got beyond that; "nous avons change tout cela" as the French say. I shall have, however, something more to say about this point before I close this lecture.

But those albuminoids are not the only compounds which plants are capable of forming with such inorganic nitrogen; many very wonderful compounds of different nature are stowed away in the root, stems, leaves and seeds of plants and trees which have nitrogen for an essential constituent. They are known as the alkaloids so much used in medicine. Although the plants and trees which yield the alkaloids grow in localities wide apart, at different altitudes, on soils of varying composition, and although they frequently come from very different parts of the plant, from the roots, the stem, the bark, the sap, the leaves and the seed, yet the fact that plants cannot elaborate these curious and valuable and dangerous substances without nitrogen, ammonia or nitric acid is common to them all. Among them are caffeine, which in tea, coffee and cocoa cheers, but not inebriates; quinia, the great fever remedy, from the bark of shrubs and trees of the tribe cinchonaceæ growing on the west slope of the Andes; morphia, from poppy juice, well known for its sedative powers and regarding which it has been remarked that by its judicious employment more happiness and by its abuse more misery has been produced than by any other drug used by mankind. Aconitia, mostly used in the anodyne liniment, seems to be to the human body outwardly what morphia is internally, a soother of pain. But it as well as atropia, brucia and strychnia are also known as the most powerful poisons. They are in appearance very innocent individuals, but they are terribly dangerous at close quarters.

The following formulæ show the composition of some of these bodies:—

