accumulated in those parts destined sooner or later to become detached from the parent stem, *i.e.*, bark, fruit, seeds and root cortex.

They are the nitrogenous products of retrograde metabolism, probably purely waste material. They may be even injurious to the plants producing them. The poppy, for example, can be poisoned by a hypodermic injection of its alkaloid, morphine—auto-intoxication, if you like. They would seem then to be of no service to the plant, except, may be, in the economy of Nature to protect them from the ravages of predatory animals or parasitic organisms.

In the cinchona plantations, instituted by the British government in India, it was found on experimenting that although the same vegetable zone and altitude were secured as the tree enjoyed in its native forests of Peru, the conditions of constant moisture, due to the daily rain and fogs there had to be imitated by artificial "mossing" by covering the bark with moss or cotton wool wrapped around the trunk, before an equal yield of quinine could be produced. This would seem to confirm the theory that its formation might be due to some anti-parasitic effort, stimulated by the micro-organisms which thrive under these conditions of combined moisture and heat with absence of sunlight.

About two thirds of the alkaloid-producing plants which have been studied are poisonous, the remainder being simple bitters.

Besides these bases found in the vegetable kingdom, substances answering to many of the alkaloidal tests are produced in the putrefaction of dead animal tissues, as is frequently seen in canned meats, fish and the tyrotoxicon of ice cream. These constitute the cadaveric alkaloids or ptomaines; while the breaking down waste of living albuminous matter forms another class known as Leucomaines, of which urea may be taken as a type. In passing, too, it might be said that many of the highly complex organic compounds, notably the coal tar derivations, which form so large a part of the materia medica of to-day, should be classified as the artificial or synthetic alkaloids, their relation chemically and physiologically being so closely allied.

Physically, the natural alkaloids occur either as non-volatile solids or as volatile liquids; all containing the elements carbon, hydrogen and nitrogen. The solids, which are much the greater number form, with few exceptions, as white crystals and contain oxygen in addition to the elements already named. Chemically, they may be considered to be compound ammonias, *i.e.*, NH_3 in which one or more of the hydrogen atoms has been replaced by a hydro-carbon or by an acid radicle. If by a hydro carbon radicle they are classified as amines; while if by an oxygenated radicle they are then known as amides. To the latter the solid crystallizable salts belong.

The name alkal-*oid* would suggest some likness to the alkalies in their general properties and in the laboratory we find this to be true. Their solutions turn red litmus blue: they combine with acids to form salts,—in doing so, however, they do not replace the basylous hydrogen in the acid, but behave like NH_3, forming a hydro acid salt. They differ from the alkalies and alkaline earths in that they do not saponify the