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XLV. *Discovery of a new Vegetable Principle in Asparagus*
(*Asparagus sativus of Linnaeus*). By M. VAUQUELIN*.

ON examining the products of the vegetable kingdom more attentively than was formerly the custom, modern chemists have distinguished a great number of products unknown to the antients; but for a long time no immediate principle has been found in any vegetable so singular and interesting as that which we are about to mention.

Last summer M. Robiquet, a young chemist who joins to a solidity of reasoning the greatest accuracy in making experiments, by desire of M. Parmentier submitted the juice of asparagus to the chemical analysis, of which he has given the results in the *Annales de Chimie* †.

During a journey I lately took to the country, having left in my laboratory a certain quantity of the juice of asparagus concentrated by evaporation, I observed in it a great variety of crystals, two of which varieties appeared to belong to new substances: as they had a different form, transparency, and taste, it was easy to separate them.

The one of these species, perfectly white and transparent when it had crystallized several times, has a fresh taste, a little nauseous, exciting the secretion of the saliva: it is hard, brittle, and has a regular form.

The other species, although equally white, is not so transparent nor so hard, nor is it crystallized in the same form; on the contrary, it is without consistency, crystallized in fine needles, having a perceptible saccharine taste, and analogous to that of manna.

M. Robiquet, on making the experiments above mentioned, had perceived the former of these substances; but he thought it was an ammoniacal salt; because at that time, having only obtained a very small quantity and imperfectly purified, it retained, to all appearance, among its flakes some traces of a salt with a base of ammonia, with which the juice of asparagus abounds; and this circumstance deceived him.

* From *Annales de Chimie*, tom. lvii. p. 18.

† See the present volume, pages 33 and 115.

Since that period M. Robiquet and myself jointly submitted this substance to new experiments, the principal of which are subjoined. The form which it assumes in its crystallization, according to M. Haüy, to whom we sent a certain quantity, springs from a straight rhomboidal prism, the grand angle of the base of which is about 130 degrees.

This substance is soluble in water in a middling degree, and its solution gives no sign of acidity or alkalinity: the infusion of galls, the acetate of lead, the oxalate of ammonia, the muriate of barytes, and the hydrosulphuret of potash, cause no change in the solution of this substance; and it is not soluble in alcohol.

These experiments indicating that the substance in question is not a salt with an earthy base, we triturated a certain quantity of it with caustic potash and a little water, to see if ammonia was disengaged from it; but we discovered no sensible traces: the potash, as we thought, rendered it more soluble in water.

Seeing, therefore, that it contained neither an earth nor any ammonia, we endeavoured to ascertain the existence of the alkalis in it, and for this purpose we burned a great quantity of it in a platina crucible; it swelled considerably, at first exhaling pungent vapours, which affected the eyes and nostrils like the smoke of wood; it furnished plenty of charcoal which had no taste, and which upon incineration left but a very imperceptible trace of earth, which is certainly foreign to it.

Towards the end of the decomposition of this substance, the smell which is liberated from it is a little analogous to that of animal matters, and it is likewise a little ammoniacal.

The nitric acid decomposes this substance; nitrous gas is disengaged; the liquor assumes a yellow colour and a bitter taste like that of animal substances; when the action of the nitric acid is finished, lime is abundantly disengaged from the ammonia of the liquor.

This alkali, therefore, is formed during the operation we have related, since the substance of asparagus affords no perceptible traces of it before.

This substance is not an acid, since it does not redden the
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the tincture of turnsole, and since it has not the taste common to all these bodies in a more or less remarkable degree.

It is not a neutral salt, since it contains neither an earth nor an alkali; but as it furnishes, by means of fire, the same products as the vegetables, we are obliged to regard it as an immediate principle of asparagus.

It is probable that it is composed, like the vegetable products, of hydrogen, oxygen, and carbon, in particular proportions: it is not less probable that there is also a small quantity of azote in it; this seems at least to be indicated by the smell which is disengaged from it by heat, and by the ammonia which it forms with the nitric acid.

Although we obtained a sufficiently large quantity of this substance, we could not submit it to a great number of experiments, because the greatest part of it was wasted in the laboratory; and the small quantity we gave M. Haüy to determine the form of it only remained: we purpose continuing our researches as soon as the asparagus season returns, but we thought it our duty to give an account of our progress hitherto.

We shall also ascertain whether or no this singular substance exists in other vegetables.

As to the saccharine matter which we also found in the juice of asparagus, we had not enough of it to recognise what kind of sugar it was; in the mean time we are of opinion that it is manna.

It may be concluded from the above experiments, that, besides the principles discovered in asparagus by M. Robiquet, there exists a principle crystallizable like the salts, which is, however, neither an acid nor a neutral salt, and the solution of which is not affected by any of the re-agents generally employed to ascertain the presence and the nature of the salts dissolved in water; and that there also exists another saccharine principle, which seems to have an analogy with manna.