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Professor Bentley.**

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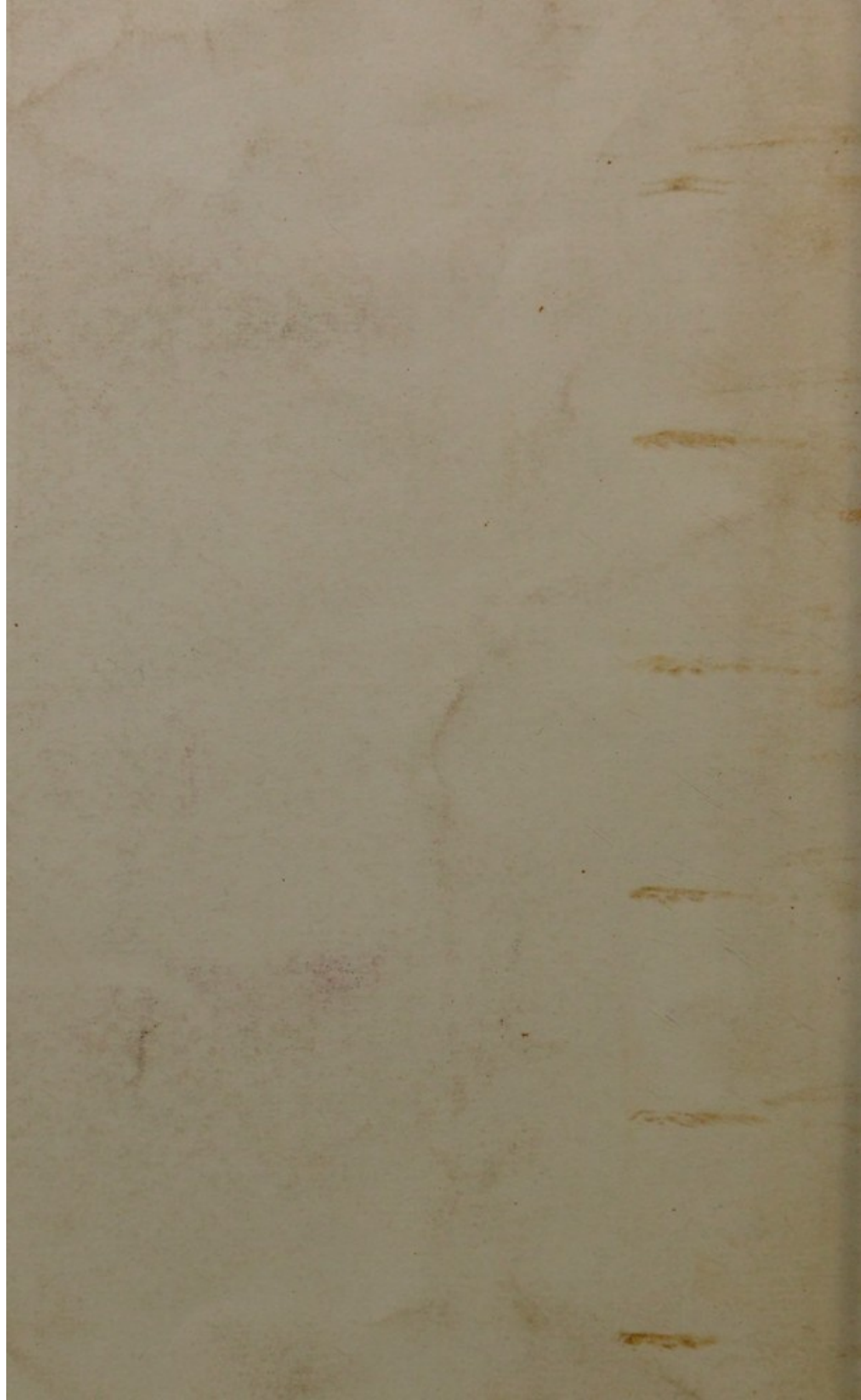
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ON A NEW KIND OF MATICO, WITH SOME REMARKS ON OFFICINAL MATICO.

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GREAT BRITAIN, ETC.

HISTORY.—Under the name of *matico*, *matecô*, or *matica*, the leaves of several plants are employed by the inhabitants of Central and South America, for arresting both external and internal hæmorrhages, and for other purposes. A nearly similar story is told throughout America, as to the discovery of the styptic property of each kind of matico. It is said, that a Spanish soldier named Matico, when desperately wounded, dragged himself into the shade of the plants near him, and in his agony plucked some of their leaves, and applied them accidentally to his wound, when to his great surprise and delight, he found in a short time that the bleeding was arrested, and the wound soon healed. From this circumstance Matico has received the Spanish names of "*Yerba soldado*," and "*Palo del soldado*," signifying "*Soldier's herb*," and "*Soldier's tree*." Three plants have been especially mentioned by authors as having received the name of Matico, or Soldier's herb, namely, *Artanthe elongata*, Miq.; *Eupatorium glutinosum*, Kunth;* and *Walteria glomerata*, Presl.† The latter has not as yet been noticed in Materia Medica works, and I have seen no specimens of it; indeed, was unacquainted with it until my attention was recently directed to this kind by Dr. Seemann. Specimens of the two other varieties of matico may be seen in the museum of the Pharmaceutical Society, and are now on the table. The first, namely, that which consists of the leaves of *Artanthe elongata*, Miq., is the only one that has received any special attention, or the action of which has been tested, beyond its native country. This kind of matico is a native of Peru, where it is very highly extolled as a vulnerary, and for its aphrodisiac and other properties.‡ It was introduced to the notice of the medical profession in England, as far back as 1839, by Dr. Thomas Jeffreys, of Liverpool,§ and it is noticed in a paper by Mr. Morson, entitled "*Observations on certain Plants of the genus Piper*," which was published, and the plant well figured, in the third volume of the '*Pharmaceutical Journal*.'|| It was subsequently introduced into the Dublin Pharmacopœia in 1850, and formulæ therein given for the preparation of "*tincture*" and "*infusion*"

* Lindley's '*Medical and Economic Botany*,' p. 227.

† Seemann's '*Botany of the Voyage of H.M.S. Herald*,' p. 85.

‡ '*Pharmaceutical Journal*,' vol. ii. p. 660.

§ '*Lancet*,' Jan. 5, 1839, p. 567.

|| '*Pharmaceutical Journal*,' vol. iii. pp. 472 and 525.

of matico." In England it has not been generally much esteemed as a medicinal agent for internal administration, and its action even when locally employed to arrest bleeding, has been regarded by some writers of eminence, as simply mechanical,—the peculiar structure of the leaves of which it is composed, being supposed to divide the blood, and thus promote its coagulation.* The committee appointed by the Medical Council to frame the forthcoming 'British Pharmacopœia' have however, and as I think properly so, thought matico of sufficient importance to be introduced into the list of *Materia Medica* to be published in that volume, and have also given a formula for the preparation of "Tincture of Matico." In the States of North America, matico has been much employed of late years, and highly extolled for its power of arresting internal hæmorrhage;† and has been introduced into the Primary List of the *Materia Medica* of the new United States Pharmacopœia, which has been just issued. The fact of matico having thus been, or about to be, introduced into the new United States and British Pharmacopœias, makes everything relating to it of especial importance at the present time, and hence, I have thought it a desirable subject to be introduced to the notice of this meeting.

From the great demand for matico which has recently arisen, in consequence principally of its extensive use in the States of North America, through the war which is now unfortunately desolating that enormous tract of country, it has become scarce and of high price; and indeed, at the present time, true matico—that which is to be officinal in the new British Pharmacopœia—is scarcely to be obtained in any quantity in this country. This scarcity of true matico, and the impossibility of immediately supplying the demand, has probably led to the recent large importation of the leaves of another plant under the same name; and the object of this paper is, more especially, to direct attention to, and to describe that substance.

My attention was first called to this matico about six weeks since, in consequence of receiving from a well-known herbalist, in extensive business in London, a sample of a drug which had been recently imported, and which consisted of dried broken leaves, some small pieces of branches, and a few spikes of flowers. I was requested to inform him as to its nature, and the name of the plant which yielded it. Upon examination, I saw directly, from the odour and botanical characteristics of the drug, that it had been derived from a plant of the Order PIPERACEÆ, and most probably from a species of the same genus as that yielding the officinal *matico*. Further examination clearly exhibited that my first conjecture was correct, and that it had been obtained from a species of *Artanthe*. Upon further inquiry I found that some genuine matico, and some of the present drug also under the name of matico, had recently arrived in the 'St. Thomas,' from Colon, a port situated at the terminus of the Panama railroad, on the Atlantic side. The drug had been consigned to a merchant in this city, and was afterwards offered for sale as matico, by a highly respectable firm of brokers. The respectability of all the parties concerned in this country, and elsewhere, who had knowledge of the transaction, and the public manner in which the drug had been offered for sale, showed that no fraud was intended, but that it was supposed to be, either true matico; or a substance allied to, and analogous in its properties to that drug, and probably known in the district from whence it had been forwarded under the same name.

Having now got a clue to the botanical and geographical source of the new drug, I went to the British Museum, where every opportunity was kindly afforded me by Mr. Carruthers of consulting the necessary books upon, and the

* Pereira's '*Materia Medica and Therapeutics*,' 4th edit. vol. ii. part 1, p. 397, and Wood and Bache's '*United States Dispensatory*,' 11th edit. p. 494.

† Carson's American Edition of Pereira's '*Materia Medica*.'

dried specimens of, the different species of *Artanthe* which were preserved in the Museum collections. As there are nearly two hundred species of this genus, natives of the West Indies and of Central and South America, described by Miquel, the standard authority of the Order *Piperaceæ*;* and from the fact of my only having some broken leaves, and a few small pieces of the branches and flower-spikes, for examination and identification, the task, as may be supposed, was by no means an easy one. At first, I thought from its having arrived with some genuine matico, and also from the resemblance it bore to a specimen in the Museum collection, marked *Artanthe elongata*, Miq., which was stated to be derived from South America, and obtained from Pavon's Herbarium, that it might be like true matico, also obtained from *Artanthe elongata*. Its marked difference from ordinary commercial matico, however, and a more minute examination, were opposed to this supposition. I then carefully compared my specimen with the other dried specimens of *Artanthe* in the Museum, and after a minute critical examination and comparison with them, I came to the conclusion that it corresponded most nearly with that marked *Artanthe adunca*, Miq. Further examination of Miquel's 'Systema Piperacearum,' as well as the works of Jacquin, Ruiz et Pavon, and of other authors which refer to the botanical characters and geographical sources of *Artanthe adunca*, have satisfied me, so far as it is possible for me to be so, from the examination of the imperfect specimens in my possession, that this new kind of matico is derived either from one of Miquel's varieties of *Artanthe adunca*, or from a species very nearly allied to it, and which can only be determined satisfactorily by the examination of more perfect specimens than those in my possession. I believe, however, that the species yielding it will turn out to be *Artanthe adunca*.

Since my examination of the above sample, I have had an opportunity of inspecting other samples at the same broker's from which it had been obtained, and I found that all of them consisted essentially of the leaves of the same plant as that just mentioned, but in some there was a little genuine matico, and the leaves, etc., of apparently some other species besides those already alluded to, mixed with them in varying proportions. The following are the synonyms, botanical characters, and geographical sources of *Artanthe adunca*, Miq.:—

SYNONYMS.—*Artanthe adunca*, Miq.; is the *Piper aduncum*, Linn.; *Piper arborescens*, Mill. Dict.; *P. scabrum*, Lam. Ill.; *P. lanceolatum*, Salzmann; *Steffensia adunca*, Kunth; and the *Piper longum, folio nervoso pallide viridi humilius*, of Sloane. The first name is that now generally employed by botanists. In common language it is known under the names of Hooked-spiked Pepper, and Spanish Elder.

Etymology.—The generic name of *Piper* appears to have been derived from *pippul*, the Bengalese name of the Long Pepper, although some authors ascribe it to *πεπτω, πεπερι*, to digest; that of *Artanthe* is from *αρτυμα*, seasoning, spice, and *ανθος*, a flower. The specific name *aduncum*, refers to its curved or hooked spike of flowers. The origin of the common name of Hooked-spiked Pepper is at once manifest; that of Spanish Elder, by which it is known in Jamaica, is derived from its protuberant jointed stems somewhat resembling those of the common Elder.

BOTANY.—The genus *Artanthe* is now universally placed in the Natural Order *Piperaceæ*.

Generic Character.—*Spikes* solitary, opposite the leaves. *Flowers* hermaphrodite. *Style* none. *Bracts* peltate or cucullate.†

* Miquel's 'Systema Piperacearum.'

† Miquel's 'Systema Piperacearum;' and Lindley's 'Medical and Economic Botany,' page 133.

Specific Character.—The following description is taken from Miquel :—*

“*Ramis ramulisque striatis aspero-verruculoso-punctulatis, junioribus appresse hispidulis, foliis breviter petiolatis, rigido-membranaceis pellucido-punctulatis, supra opacis scabriusculis, subtus pallidis puberulis, lato-oblongis vel (summa) sublanceolato-oblongis, plus minus inæquilateris, acuminatis, basi leviter inæquali rotundatis, lineato-multi-(6-7)-costatis, amentis erectiusculis folio brevioribus, falcatis curvatis, pedunculo petiolum quater vel quinquies superante, bracteis peltatis, ciliato-fimbriatis, baccis obovato-tetragonis, vertice subrotundatis, semine conformi leviter areolato.*”

Miquel also enumerates the following four varieties :—*Forma foliis omnibus lanceolato-oblongis*, from Jamaica; *Forma foliis angustioribus*, from French Guiana; *Forma caule ramisque glabris*, from Porto Rico, etc.; and *Forma foliis rugosioribus et magis scabris*, from Brazil and Bahia. Hence it is evident that the species varies much according to its geographical source, which renders it more probable that, although the new matico differs in some minor details from Miquel's description as given above, as it agrees in the main with it, we are correct in referring it to *Artanthe adunca*, Miq.

Habitat.—*Artanthe adunca* has a wide geographical distribution throughout the tropical regions of America. It has been found in Jamaica, Barbadoes, San Domingo, Porto Rico, the Caraccas, Surinam, Bahia, Valencia, Guiana, and the Brazils. Its wide geographical distribution is an additional argument in favour of the present kind of matico being derived from it.

GENERAL CHARACTERISTICS.—As imported, this new kind of matico consists chiefly of dried, more or less broken, loosely aggregated or somewhat compressed fibrous leaves; together with a very few flower-spikes; and small fragments of branches. It has a greenish colour; a strong, agreeably aromatic, and somewhat pungent odour, in some respects resembling that of true matico; and an aromatic, somewhat spicy, pungent taste.

More minutely examined, the *leaves*, (of which some may be found nearly entire), are then seen to be four, five, or more inches in length, and from one and a half to two and a half inches in breadth. They are oblong, oblong-lanceolate, or oblong-ovate in form, entire at the margins, acuminate-pointed, and somewhat unequal, and more or less rounded at the base. They have short petioles, which are channelled above, rounded beneath, and enlarged at the base, or part by which they were originally attached to the stem, and are commonly somewhat rough, or more or less hairy or pubescent. They have a somewhat membranous texture. Their upper surface is dark-green, opaque, and commonly more or less rough, although in some specimens they are nearly smooth; they are without hairs, and have from four to six somewhat sunken veins, arising alternately on each side of the midrib, and passing upwards parallel to, and approaching each other above, and ultimately terminating at the margins. Towards the base are several other smaller veins, which pass at once to the margins of the leaf. The under surface is pale-green, with prominent light-coloured veins, which in number and direction correspond to the veins above; these divide more or less, and give a corresponding, more or less reticulated character to the surface. There are commonly no hairs between the ramifications of the veins (although in some leaves these may be found); but the veins themselves are usually more or less pubescent, and in some cases very evidently so.

The *stalks* are striated, more or less compressed, somewhat rough from the presence of minute tuberosities on the surface, and are furnished at intervals with prominent nodes.

* Miquel's *Systema Piperacearum*, page 449. Figures of the plant may be seen in Sloane's *Natural History of Jamaica*, vol. i. p. 135, tab. 87, fig. 2; and Jacquin's *Icones Plantarum Rariores*, vol. ii. tab. 210.

The *flower-spikes* are slender, of a cylindrical shape, yellowish or brownish in colour, closely covered with minute flowers, more or less hooked, curved, or twisted, and three or more inches in length.

It will be seen from the above characteristics that, the new kind of matico may be at once distinguished from the officinal and old kind of matico, by the leaves, etc., being in a less compressed state than in it; by their more fibrous nature, which makes them more difficult to reduce to powder; by their upper surface not being so tessellated or rough; and generally, by the almost entire absence on the under surface of pubescence, and in all cases, far less pubescent character. Hence the tessellated upper surface, and very pubescent character of the lower surface of the leaves constituting true matico are, at once sufficient to distinguish them from the leaves of the new kind of matico.

COMPOSITION AND CHEMICAL CHARACTERISTICS.—The chemical composition and characteristics of officinal matico were investigated as far back as 1844, by Dr. John F. Hodges, and the results communicated to the Chemical Society.* He found the following substances in it:—an *aromatic volatile oil*, a *bitter principle*, which he termed *maticine*, a *soft dark-green resin*, *chlorophyll*, a *brown colouring-matter*, a *yellow colouring-matter*, *gum*, *nitrate of potash*, *salts*, and *lignin*. It was subsequently analysed by Mr. Wiegand, of Philadelphia, and according to him, the so-called *maticine* of Dr. Hodges is nothing more than a salt of potassa. Mr. Stell, in an inaugural essay presented to the Philadelphia College of Pharmacy, in March, 1858, confirms the conclusion of Mr. Wiegand, as to the non-existence of the *maticine* of Dr. Hodges; and he failed in obtaining any principle from matico, similar to *piperine* or *cubebine*, and which from its being derived from a nearly allied plant it might have been supposed to contain.† Mr. Stell concluded from his experiments that the medicinal properties of matico depended upon the volatile oil and soft resin. The resin obtained by Mr. Stell was of a ruby-red colour, and hence he concluded that the green colour of the resin of Dr. Hodges, was due to the admixture with it of chlorophyll.

An infusion of the broken-up leaves reduced to coarse powder of the *new kind of matico*, in the proportion of one ounce to thirty ounces of boiling water, and allowed to macerate for twenty-four hours, had a dark clear reddish-brown colour, somewhat resembling brown sherry, and not distinguishable in this respect from an infusion of true matico, made of the same strength and in a similar manner to it. It had an agreeably aromatic, and somewhat spicy, pungent odour; and an aromatic, agreeable, somewhat spicy, pungent taste. In the two latter respects it resembled the infusion of true matico; but was more agreeable than it, and somewhat more pungent. It exhibited the following reactions:—*Tincture of iodine* heightened the colour considerably, and produced a slight opacity, but no precipitate; *solution of persulphate of iron* caused a deep brownish-blue-black coloration, and a plentiful brown precipitate; *solution of perchloride of iron* caused a deep bluish-green-black coloration, but no precipitate; *solution of ferridcyanide of potassium* simply heightened the colour; *solution of acetate of lead* caused an abundant yellowish-brown, light precipitate; *solution of baryta*, an abundant, somewhat gelatinous-like, yellowish-brown precipitate; *solution of nitrate of baryta*, a plentiful, whitish, light, flocculent precipitate; *solution of nitrate of silver*, a plentiful, flaky, gelatinous-like, yellowish-white-brown precipitate; *solution of sulphate of copper*, an abundant brownish, light flocculent precipitate; *solution of bichloride of platinum*, an abundant yellowish-white, light precipitate; solu-

* Proceedings of the Chemical Society, vol. ii. p. 123, for 1844; and Pharm. Journ. vol. iv. 1844-45, p. 286.

† 'American Journal of Pharmacy,' vol. vi. 1858, p. 392; and Proceedings Amer. Pharm. Assoc. for 1859, p. 49.

tion of protochloride of tin, a plentiful reddish-brown precipitate; *solution of chloride of calcium* produced no evident effect at first, but slowly an evident whitish light floating precipitate was formed; *solution of sulphate of lime* also had no marked effect at first, but ultimately caused a slight whitish precipitate; *solution of chloride of lime* at first heightened the colour, which afterwards slowly lessened again, and a plentiful whitish precipitate was formed; *tincture of galls* caused an opaque muddy appearance, and a very slight precipitate; *hydrochloric acid* caused an abundant, whitish, more or less floating precipitate; *nitric acid*, a plentiful, brownish, light precipitate; and *sulphuric acid* an abundant brownish, light precipitate. No very evident effects were produced by the addition to the infusion of either *blue* or *red litmus papers*; or by that of *turmeric paper*; nor by *acetic acid*; nor by any of the following solutions:—*Solution of potash, chromate of potash, ferrocyanide of potassium, antimoniate of potash, carbonate of potash, potassio-tartrate of antimony, gelatine, ammonia, oxalate of ammonia, sulphate of soda, and bichloride of mercury.*

An infusion of *officinal matico* was made at the same time as the above, of the same strength, and in other respects like it; and when it was submitted to the action of the various reagents just mentioned, the effects produced were in all cases almost identical with those caused in the infusion of the new kind of matico. I have given the action of the reagents in full, as the list is more extended than any hitherto published. The reactions obtained by Dr. Hodges, so far as he investigated them, agree essentially with my own.

From the similar action of the various reagents upon the two kinds of matico, I may fairly conclude that their composition must be nearly identical; and there can be little doubt therefore that, the medicinal properties of the new matico are also due to the presence of an essential oil and resin. The presence of the volatile oil is at once made evident by submitting the leaves previously macerated in cold water, to distillation. Some of the product then obtained, which has been distilled for me by Mr. Tilden in our laboratory, is now on the table, and as may be noticed, it possesses the peculiar odour of the dried leaves. It is evident from the above that the best form of administration would be an alcoholic extract or tincture.

MEDICINAL PROPERTIES AND USES.—With regard to the medicinal properties of this new kind of matico, I think we may safely conclude, from its chemical, botanical, and physical resemblances to that of true matico, that they must be also nearly identical, at least when administered internally, to it. Its local action, when applied externally to arrest hæmorrhage, would be doubtless, to some extent, less powerful than that of true matico, as its structure would not act mechanically to the same extent as it; indeed, those who believe that true matico in such cases acts simply from its peculiar structure dividing the blood and thus promoting its coagulation, would attribute little, if any, value to this kind of matico; but I am convinced, from my own experiments, and from the recorded observations of others, as well as from various communications on the subject that I have received from practitioners in this and other parts of the world, that the power which true matico possesses of arresting hæmorrhage, when locally applied, cannot be due simply to its mechanical action.

That this new kind of matico does possess valuable medicinal properties is also probable from the fact of various parts of the plant yielding it, namely, the *Artanthe adunca*, having had, and at the present time being considered to have, a great reputation in various diseases in the different districts in which it is a native. The earliest notice that I can find of its medicinal properties and uses is in Sloane's 'Natural History of Jamaica,'* where the following abstract, taken by him from Piso's 'Natural History of

* Sloane's Nat. Hist. Jam. vol. i. p. 135.

Brazil,' published at Amsterdam in 1648, occurs:—"The fruits which are like Long-Pepper are of no use, the root is very famous. It has something aromatick, and in tast, colour, and smell, resembles ginger, especially if it be fresh, and then it is not inferiour to it. It is very hot and dry. A decoction of the leaves and roots cures the colic and pains of the limbs, eases the windy belly, and takes away the cold tumors of the feet. The same is done by baths and fomentations." Miquel, in his 'Systema Piperacearum,' already frequently quoted, says that the spikes of it and other species of *Artanthe* are used in the same manner as long pepper, for flavouring, seasoning, etc., and also on account of their medicinal properties. Martius also refers to the use of its spikes of fruits as a substitute for pepper in tropical America; and he moreover states that in Brazil, the leaves of *Artanthe adunca* have a similar reputation to, and are employed in the same diseases as cubebs, and that those of *Artanthe elongata* (true matico) are used in Peru in like manner.*

From the evidence now given, I think we can come to no other conclusion than—that this new matico is well worthy of a trial in this country in similar diseases to those in which the officinal matico has been found efficacious. The trial of its virtues is rendered still more necessary at present, on account of the scarcity and high price of true matico. This scarcity will be most probably but temporary, but it will certainly be rather anomalous and remarkable if, when the long and anxiously expected and desired stranger—the new Pharmacopœia—at length sees the light of day, one of the substances therein ordered cannot be obtained, or a substitute be at hand for immediate use until that deficiency can be supplied.

* Lindley's 'Vegetable Kingdom,' p. 518.



