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Botanical Medicine Monographs and Sundry

PRACTICAL NOTES

Coloring for Tooth Powder, etc.—An unobjectionable color for tooth powder can be made by dissolving 1 oz. of the best carmine in 6 fluid-ounces of stronger solution of ammonia, and adding this to a portion of the precipitated chalk in a large mortar, using sufficient quantity to absorb the liquid. This is triturated with more of the carbonate of calcium until enough is added to bring it to the state of powder. This is then allowed to dry, and, when free from the smell of ammonia, mixed with the other ingredients of which the dentrifice is composed. The quantities given are sufficient to give a brilliant pink tint to thirteen pounds of tooth powder. By making a solution of carmine in ammonia a more thorough diffusion of color is effected, and 1 oz. of carmine used in this way will be equal to about one and three quarter ounce when used as a powder.

Cleaning Mortars, Slabs, etc.—Mortars in which oil, balsam or grease have been mixed should first be thoroughly scraped with a spatula, then wiped out with paper, next with a piece of cotton batting slightly moistened with spirits of turpentine, and, lastly, with cotton moistened with a little soap liniment, and washed with water. By this treatment tar, oil, grease, petroleum, balsams, iodoform, asafoetida and resins can be effectually removed and much time and annoyance saved. Stains from iodine are best removed by rubbing a few grains of iodide of potassium and a very small quantity of water together, which forms a concentrated solution in which iodine is soluble. For permanganate of potassium stain use muriatic acid. Indigo will be removed by strong sulphuric acid.

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Chinese White Wax.—From an article in the “British Mail” on the white wax industry of China, it seems that the average annual value of this peculiar crop amounts to about £650,000. From Han-kow alone upwards of £81,000 worth of this wax was exported in 1879. The

Chinese white wax is a deposit found on twigs of *Ligustrum lucidum*, and caused by the puncture of an insect. It is said that in Keenchang district the plant thrives in great abundance, and in the spring of the year the twigs are covered with countless swarms of flies having the appearance of a brown film. The branches soon became covered with a white soap-like incrustation, which increases in volume till the commencement of the fall of the year, when the sprays are cut off and immersed in water which is kept boiling. The viscid substance rises to the surface, and is skimmed off, melted and allowed to cool in deep pans. It was accidentally discovered that, by transporting the insects from their native districts to the more vigorous one of Keating-fu, in the north of the province, their power of discharging wax was largely augmented—a property which was promptly and extensively availed of by the Sze-chuen traders. The period between evening and morning is chosen for conveyance, because many hours of sunlight would precipitate the hatching. This should take place only after the females have been attached to the trees. Arrived at their destination, six or more of the mothers—which are enormously prolific—are tied, wrapped in a palm leaf, to a branch of the ligustrum. A few days later the young flies are swarming on the twigs, where they fulfill their mission by the month of August; then they perish in the cauldrons, where the results are immediately collected. It is stated that this peculiar industry requires the exercise of great care and forethought.—*Pharm. Jour. and Trans.*, Oct. 16, 1880, from the *Gardeners' Chronicle*, Oct. 2, 1880.

A NEW METHOD FOR THE EXAMINATION OF COFFEE.

BY F. M. RIMMINGTON.

I think it will be generally admitted that the methods in use for estimating the degree of adulteration in coffee are far from satisfactory as regards definiteness and certainty, and that something approaching nearer to chemical accuracy is very desirable. Little has been done in this direction since the days of the "Lancet" Sanitary Commission.

It may, possibly, not be generally known to analysts that chicory, dandelion and probably some other substances that are used for mixing with coffee, are readily deprived of color by a weak solution of chloride of lime (hypochlorite), and that this agent has very little action on the

coffee. When this method is adopted a portion of the coffee should be gently boiled a short time in water with a little carbonate of soda, so as to remove extractive as much as possible; after subsidence the liquor should be poured off, and the residue washed with distilled water. When this has been sufficiently done, a weak solution of the hypochlorite of lime is to be added and allowed to remain, with occasional stirring, until decoloration has taken place, which will probably be in two or three hours. The coffee will then form a dark stratum at the bottom of the glass, and the chicory a light and almost white stratum floating above it, and showing a clear and sharp line of separation.

The chicory after this operation is in the very best condition for microscopical examination, and it is not difficult to discriminate between chicory, dandelion or other substances. Although the lower stratum may be dark, and have all the appearance of coffee, other substances may be present and should be sought for. I have recently met with a substance which is entirely new to me, as a coffee substitute, that is not affected by this treatment.—*Phar. Jour. and Trans.*, Jan. 1, 1881.

NOTES ON CANANGA OIL, OR YLANG-YLANG OIL.

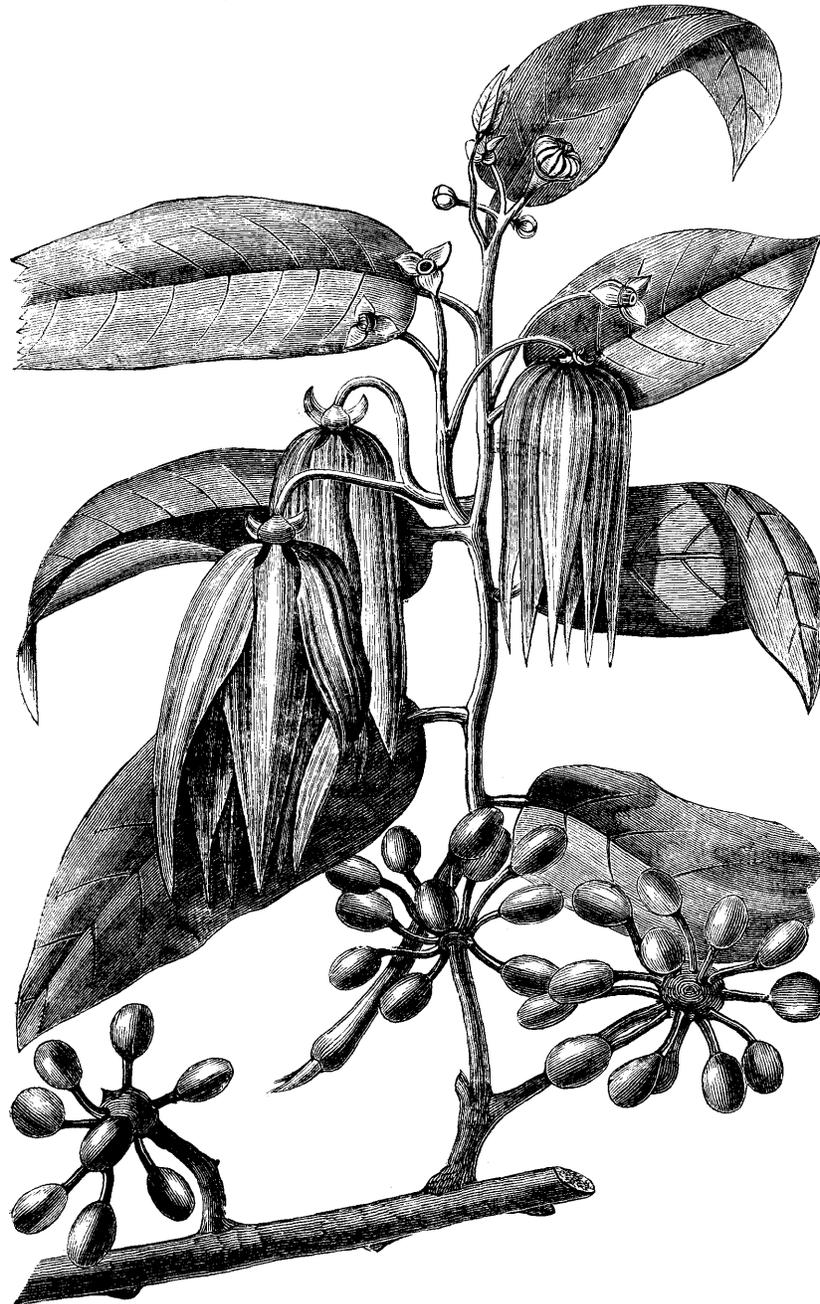
BY PROFESSOR F. A. FLUCKIGER.

Translated from "Arch. der Phar.," Jan., 1881, Band xv, pp, 24 to 31, by FRED. B. POWER.

This oil, on account of its pleasant odor, which by most observers is designated as very exquisite, has acquired some reputation, so that the following notes upon the same, and the plant from which it is derived, may be of general interest.

The tree whose flowers furnish the oil known under the name of Ylang-Ylang, or Alanguilan, is *Cananga odorata*, Hooker fil. and Thomson, from the family of Anonaceae, for which reason it is also termed in many price lists *Oleum Anonæ*, or *Oleum Unonæ*. It is not known to the author whether the tree can be identified in the old Indian and Chinese literature; in the Occident it was first named "Arbor Saguian" by Ray, and was so called at that time in Luçon. Rumph gave a detailed description of the Bonga Cananga (Tsjampa of the Javanese), as the Malayan designation of the tree is expressed. Rumph's illustration, however, is faulty. Lamarck has made further short reports thereon under *Canang odorant* and *Uvaria odorata*. According to Roxburgh, the

plant was brought in 1797 from Sumatra to the botanical garden of Calcutta. Dunal gave of *Uvaria odorata*, or properly *Unona odorata*, as corrected by himself, a somewhat more detailed description in his "Monographie de la famille des Anonacees," which is chiefly a repetition of the statements of Rumph.



CANANGA ODORATA, Hook. fl. (One-half the natural size.)

We are finally indebted for a very fine illustration of the *Cananga odorata* to the magnificent *Flora Javæ* of Blume; a copy of this, which in

the original is handsomely colored, is reproduced with this notice. That the illustration is correct may be accepted from the fact of the authors having seen numerous specimens of the cananga by De Candolle in Geneva, also in the herbarium of Delessert. The unjustifiable appellation *Unona odoratissima*, which has passed inaccurately enough into many writings, originated with Blanco, who, by his description of the intense perfume of the flowers, which in a closed sleeping apartment produces headache, permitted himself to be drawn to the employment of the superlative *odoratissima*. Baillon designates as *Canangium* the section of the genus *Uvaria*, from which he contends the Ylang-Ylang tree should not be separated. The notice of Maxi-mowicz, "Ueber den Ursprung des Parfüms Ylang-Ylang," contains only a confirmation of the derivation of the same from *Cananga*.

Cananga odorata is a tree attaining a height of 60 feet, with few but richly ramified branches. The leaves, which are arranged in two rows, on short petioles and longly pointed, attain a length of 18 centimeters and a breadth of about 7 cm.; the surface of the leaf is somewhat firm, and only on the under side, along the nerves, slightly downy. The beautiful and imposing flowers amount to as many as four, upon short pedicels. The three lobes of the leathery calyx are finally turned back. The six lanceolate flat petals grow to a length of 7 cm. and a width of about 12 millimeters, are longitudinally nerved, of a greenish color, and, when dried, dark brown. The somewhat bell-shaped, gracefully declining flowers, present a quite pretty aspect, although the flowers of other related plants are far more attractive.

The filaments of *Cananga* are very numerous; the somewhat elevated receptacle is flatly depressed at the vertex. The green berry-like fruit consists of from 15 to 20 distinct carpels, on rather long pedicels, and enclosing from 3 to 8 seeds, arranged in two rows. The umbel-like inflorescence is situated in the axils of the leaves, or arises from the nodes of leafless branches. The fleshy portion of the fruit is sweetish and aromatic; the flowers possess the most excellent perfume, which is often compared with the hyacinth, narcissus and clove.

Cananga odorata, according to Hooker and Thomson and Bentham and Hooker, is the only species of this genus; the plants, which were formerly classed together with it under the name of *Unona* or *Uvaria*, and of which some likewise have flowers possessing a pleasant odor, are retained in these two genera, which are quite rich in species. From

Uvaria the Cananga is distinguished by the valvate corolla, and from Unona by the double-rowed arrangement of the seed.

Cananga odorata is distributed throughout entire southern Asia, but principally as a cultivated plant. In the primitive forest the tree grows much higher, but the flowers, according to Blum, are almost odorless. In its habitus Cananga resembles *Michelia champaca*, Lin., nat. ord. Magnoliaceae, a tree of India much admired on account of the very pleasant odor of its yellow flowers. Among the flowers which exhale a pleasant perfume, and to which the Javanese in this respect are much accustomed, those to which the preference is given by them, are in the first line the "Tjempaka," *Michelia champaca*, and the "Kenangga wangi," *Cananga odorata*.

It is not known to the author whether the oil of Cananga was prepared in former times; it appears to have first reached Europe about 1864, and in Paris and London its choice fragrance found full recognition. The very small amounts which were first imported from the Indian Archipelago were soon followed by somewhat larger consignments from Manilla, where German pharmacists occupied themselves with the distillation of the oil.

Oscar Reymann and Adolf Rösch, in Manilla, exhibited the Ylang-Ylang oil at Paris in 1878; the former had also in addition the Cananga flowers themselves. The oil, standing by its side of the flowers of the previously mentioned *Michelia champaca*, competes with the Cananga oil, or Ylang-Ylang oil, in respect to fragrance. To what extent the latter has found favor is difficult to judge, although the reduction in price which the same has experienced would speak, probably, for a somewhat larger demand; at present it is to be had in Germany for about 600 marks (150 dollars) per kilogram.¹ As the Cananga tree may be cultivated very easily in all warmer countries, and is probably everywhere provided with the same delightful fragrance of the flowers, it must be possible to furnish the oil much cheaper, although the amount obtained is always quite small (25 grams of oil from 5 kilograms of flowers, according to Reymann). It is a question whether the tree would not flourish, for example, in Algeria, where already so many exotic perfume plants are cultivated.

¹ According to information furnished by Mr. Reymann, there are annually consumed in Paris, Nizza and Grasse about 200 kilograms, in London about 50 kilograms, and as much in Germany (Leipsic, Berlin, Frankfurt).

According to Guibourt, the *Macassar oil*, which was at one time highly prized in Europe as a hair oil, is cocoa nut oil digested with the flowers of *Cananga odorata* and *Michelia champaca*, and colored yellow by means of curcuma. In India, ointments of this kind have been in use for a very long time.

The name *Cananga* is found, moreover, also in Germany, in former times. An *Oleum destillatum Canangæ* is mentioned by the Leipsic apothecary J. H. Linck, under "einigen neuen Exoticis" in the "Sammlung von Natur und Medicin-, wie auch hierzn gehörigen Kunst- und Literatur-Geschichten, so Anno 1719 in Schlesien und ;anderen Landern begeben," Leipzig and Budissin, 1719. As, however, the fruit of the same tree, which was sent at the same time with this *Cananga* oil, is described by Linck as exceptionally bitter, it cannot probably here refer to the present *Cananga odorata*, the fruit pulp of which is emphatically designated by Rumph and by Blume as sweetish. Furthermore, an *Oleum Canangæ*, Camel straw oil, held a place, in 1765, in the tax of Bremen and Verden. It may remain undecided whether this oil was really derived from camel straw, from the beautiful grass *Andropogon laniger*.

From a chemical standpoint, the *Cananga* oil has become of interest through the information furnished by Gal that it contains benzoic acid, and without doubt in the form of a compound ether. As well as the author remembers the literature of the volatile oils at the moment, this occurrence of an ether of benzoic acid in nature is an isolated one (not considering Peru balsam and Tolu balsam), although of itself it cannot be surprising, and presumably will be often detected. The author induced Mr. Adolf Convert to examine the Ylang-Ylang oil in this direction. The oil does not change litmus paper moistened with alcohol; at 170°C. a small portion distilled over, but the mercury rose gradually to 290°C., and at a still higher temperature decomposition took place. That the portions which passed over below 290°C. had a strongly acid reaction pointed already to the presence of compound ethers. Mr. Convert boiled 10 grams of the oil with 20 grams of alcohol and 1 gram of caustic potassa for one day in a flask provided with an inverted condenser. The alcohol was finally removed by distillation, the residue supersaturated with dilute sulphuric acid, and together with much water subjected to distillation until the distillate scarcely showed an acid reaction. The liquid which had passed over was neutralized with barium carbonate, and the filtrate concentrated, whereupon it furnished

crystals which were recognized as nearly pure acetate. The acid residue, which contained the potassium sulphate, was then shaken with ether; after the evaporation of the latter there remained a crystalline mass of an acid reaction, which assumed a violet color with ferric chloride. This reaction, which is probably to be attributed to a phenol, was not shown after the crystalline mass had been recrystallized from boiling water; the aqueous solution of the purified crystalline scales then gave with ferric chloride simply a slight flesh-colored precipitate. The crystals melted at 120°C.

For the confirmation that the substance was benzoic acid, Mr. Convert boiled the same with water and oxide of silver, and dried the scales obtained on cooling over sulphuric acid. 0.0312 gram of the crystals gave upon combustion 0.0147 gram of silver, or 47.1 per cent.; benzoate of silver contains 46.6 per cent. of metal; the crystals were accordingly, in fact, benzoate of silver. For the separation of the alcoholic constituent, which is present apparently in not very considerable amount, in the form of a benzoic ether, much more Ylang oil would be required.

Besides the benzoic ether and a supposed above-mentioned phenol, an aldehyd or ketone is also indicated in the Ylang oil, in so far as by shaking the latter with acid sodium sulphite the formation of a very small amount of crystals was observed. That Gal did not obtain the same must remain unexplained. Like the benzoic acid, the acetic acid is also undoubtedly present in the Cananga oil in the form of a compound ether.

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Duboisina.—Mr. Duquesnel, a pharmacist, has presented to the French Academy crystallized specimens of the pure alkaloid of *Duboisia myoropoides*. Duboisina, which had previously been obtained only as a syrupy amorphous product of a yellow color, crystallizes in fine colorless needles, grouped around a central point; it is much less soluble in water than the amorphous product, and forms with sulphuric acid a neutral salt, easily crystallizable, deliquescent, and possessing very energetic mydriatic properties. The chemical study will determine in what respects it resembles or differs from atropina, and its physiological study has been undertaken at the laboratory of physiology, under the direction of Dr. Laborde, who will make known the results. —*Jour. de Pharm. et de Chim.*, Jan., 1881, p. 39.

THE STORY OF CINCHONA LEDGERIANA.

The following interesting letter from Mr. C. Ledger, so well known in connection with cinchona cultivation, has been sent to us for publication by his brother, Mr. G. Ledger, to whom it was written:

While engaged in my alpaca enterprise, 1856, I received in the interior of this republic (on the high table plains of San Antonio de los Cobres, in the province of Jujuy), by return of express, that some two months before I had sent to the port of Cobija for letters, funds, etc., a packet of newspapers. In one of the papers I read that Her Majesty's government were sending out to South America a special mission, under charge of Mr. Clements R. Markham, in search of plants and seeds of the cinchona. A Bolivian Indian, Manuel Tucra Mamani, formerly and afterwards a cinchona bark cutter, was then accompanying me, with two of his sons. He had been in my service since 1843. He accompanied me in almost all my frequent journeys into the interior, and was very useful in examining the large quantities of cinchona bark and alpaca wool I was constantly purchasing. I never could get him to ride; he was always at "my stirrup," and would show no fatigue after a journey of fourteen to twenty leagues daily for eight to twelve days consecutively. He and his sons were very much attached to me, and I placed every confidence in them. Sitting around our camp fire one evening, as was my custom after dinner, conversing on all sorts of topics, I mentioned what I had read as to Mr. Markham's mission. Now, Manuel had been with me in three of my journeys into the cinchona districts of the Yungas of Bolivia, where I had to go looking after laggard contractors for delivery of bark. It was while conversing on the subject of Mr. M.'s journey, and wondering which route he would take, etc., Manuel greatly surprised me by saying, "The gentleman will not leave the Yungas in good health, if he really obtains the 'rojo' plants and seeds." Manuel was always very taciturn and reserved. I said nothing at the time, there being some thirty more of my Indians sitting around the large fire. The next day he reluctantly told me how every stranger on entering the Yuugas was closely watched, unobserved by himself; how several seed collectors had had their seed changed; how their germinating power was destroyed by their own guides, servants, etc. He also assured me how all the Indians most implicitly believe if by plants or seed from the Yungas the cinchonas are successfully propagated in other countries all their own trees will perish. Such, I assure you, is their superstition. Although

there are no laws prohibiting the cinchona seed or plants being taken out of the country, still I have seen in private instructions from the prefect in La Paz to sub-prefects of Sorata and Caupolican ordering strictest vigilance, to prevent any person taking seed or plants out of the country. More than half a dozen times I have had my luggage, bedding, etc., searched when coming out of the valleys of the Yungas.

So much importance did I attach to all I heard from Manuel, that, as an Englishman, I looked upon it as a duty to advise Mr. Markham and put him on his guard. I consequently addressed him, relating all I had heard, under cover to Mr. George H. Nugent, H.B.M.'s vice consul, Arica, sending by express (on foot, of course) a distance of more than 600 miles. Some two months after I received answer, saying, "Your letter arrived too late. Mr. Markham is now in Carabaya, not having been allowed to enter Bolivia." Although Mr. Markham was unsuccessful upon this occasion, he subsequently succeeded, as related by him in his "Popular Account of the Introduction of Cinchona Cultivation into British India," 1880, and in a book published in 1862.

You are aware how I am looked upon as a doctor by the Indians. Well, one day soon after, when making a decoction from some "coca" leaves, Manuel had brought me the boiling water, I said: "Manuel, I may some day require some seed and flowers of the famous white flower, rogo cascarrilla, as a remedy, and I shall rely on your not deceiving me in the way you have told me." He merely said, "Patron, if you ever require such seed and flowers, I will not deceive you." And I thought no more about it.

Manuel was never aware of my requiring seed and leaves for propagating purposes; he was always told they were wanted to make a special remedy for a special illness. After much thought, and from my knowledge of him, I question if he would have got them for propagating purposes. He was very much attached to me, no doubt, but he was afraid of his own people.

For many years, since 1844, I had felt deeply interested in seeing Europe, and my own dear country in particular, free from being dependent on Peru or Bolivia for supply of life-giving quinine, remembering and relying on Manuel's promise to me in 1856, and I resolved to do all in my power to obtain the very best cinchona seed produced in Bolivia.

His son Santiago went to Australia with me in 1858. In 1861, the day before sending back to South America Santiago and other Indians who had accompanied me there as shepherds of the alpacas, I bought 200 Spanish dollars, and said to him: "You will give these to your father. Tell him I count on his keeping his promise to get for me 40 pounds to 50 pounds of rogo cinchona (white flower) seed. He must get it from trees we had sat under together when trying to reach the Mamore river in 1851; to give my kindest remembrances (and small present) to Fra Simon, curate in the Apolo missions; to meet me at Tacna (Peru) by May, 1863; if not bringing pure, ripe rogo seed, flowers and leaves, never to look for me again; should I not have arrived from Australia, to give seed, etc., to my-daughters, who would give him \$400." In June, 1863, he sent a nephew to my children at Tacna asking for \$200, saying he had not then collected seed for the patron, but by next season would do so if well ripe and not hurt by frost.

I arrived back in Tacna on the 5th of January, 1865, after separation of twelve years from my home and children, completely ruined by the introduction of the alpaca into the Australian colonies turning out a failure.

I at once sent message to Manuel, informing him of my arrival. At the end of May he arrived with his precious seed. It is only now some twenty-four years after poor Manuel promised not to deceive me; manifest how faithfully and loyally he kept his promise. I say poor Manuel because, as you know, he lost his life while trying to get another supply of the same class of seed for me in 1872-3. You are aware, too, how later on I lost another old Indian friend, poor Poli, when bringing seed and flowers in 1877.²

I feel thoroughly convinced in my own mind that such astonishingly rich quinine-yielding trees as those in Java are not known to exist (in any quantity) in Bolivia. These wonderful trees are only to be found in the Caupolican district, and, as rightly stated by Mr. John Eliot Howard, F.R.S., are only to be met with in eastern Yungas. The white flower is specially belonging to the cinchona "rogo" of Apolo.

You will call to mind, no doubt, the very great difficulties you had to get this wonderful "seed" looked at even; how a part was purchased by Mr.

² I'm not sure that I like Mr. Ledger very much—MM

Money for account of our East Indian Government for £50, under condition of 10,000 germinating. Though 60,000 plants were successfully raised from it by the late Mr. M'lvor, I only received the £50.

The seed taken by the Netherlands Government cost it barely £50. I have recently received advice from the courteous Minister for the Colonies, that he proposes to submit to the State General that £100 be awarded to me.

I see by "The Field" you sent me, containing some account of the propagation of cinchona in Java, that up to this time the seed collected from best specimens has been so well propagated that there are now 707,670 Ledgerianas possessed by the government. At 1d. each that would give £2,948, 12s., 6d.; at 4 pounds of bark per tree, at low price of 8s. per pound,. £1,132,272. Seeing the immense present and future wealth resulting from my seed, I cannot sometimes help thinking that I am another illustration of the axiom that "inventors are always losers." As far as I am concerned, I lose in money, having spent more than £600, without taking into account the labor and anxiety of so many years. Such, then, is the "story" attaching to the now famous *Cinchona Ledgeriana*, the source of untold wealth to Java, Ceylon and, I hope, to India and elsewhere. I am proud to see my "dream" of close on forty years ago is realized—Europe is no longer dependent on Peru or Bolivia for its supply of life-giving quinia.

C. LEDGER. —*The Field*, Feb. 5.